CLEMSON UNIVERSITY

RECORD
SEVENTY-SECOND YEAR

CATALOG NUMBER
1964-1965

PRELIMINARY ANNOUNCEMENTS, 1965-1966

Published quarterly by Clemson University, Clemson, South Carolina
Second-class postage paid at Clemson, South Carolina
<table>
<thead>
<tr>
<th>JANUARY</th>
<th>FEBRUARY</th>
<th>MARCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>S M T W T F S</td>
<td>S M T W T F S</td>
<td>S M T W T F S</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2015</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APRIL</th>
<th>MAY</th>
<th>JUNE</th>
</tr>
</thead>
<tbody>
<tr>
<td>S M T W T F S</td>
<td>S M T W T F S</td>
<td>S M T W T F S</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2016</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>JULY</th>
<th>AUGUST</th>
<th>SEPTEMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>S M T W T F S</td>
<td>S M T W T F S</td>
<td>S M T W T F S</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2017</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OCTOBER</th>
<th>NOVEMBER</th>
<th>DECEMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>S M T W T F S</td>
<td>S M T W T F S</td>
<td>S M T W T F S</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2018</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>JANUARY</th>
<th>FEBRUARY</th>
<th>MARCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>S M T W T F S</td>
<td>S M T W T F S</td>
<td>S M T W T F S</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2019</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APRIL</th>
<th>MAY</th>
<th>JUNE</th>
</tr>
</thead>
<tbody>
<tr>
<td>S M T W T F S</td>
<td>S M T W T F S</td>
<td>S M T W T F S</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2020</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>JULY</th>
<th>AUGUST</th>
<th>SEPTEMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>S M T W T F S</td>
<td>S M T W T F S</td>
<td>S M T W T F S</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2021</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OCTOBER</th>
<th>NOVEMBER</th>
<th>DECEMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>S M T W T F S</td>
<td>S M T W T F S</td>
<td>S M T W T F S</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2022</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>COLLEGE CALENDAR 1964-1965</td>
<td>4</td>
</tr>
<tr>
<td>COLLEGE CALENDAR 1965-1966</td>
<td>5</td>
</tr>
<tr>
<td>PART I—PERSONNEL</td>
<td>7</td>
</tr>
<tr>
<td>Board of Trustees, Board of Visitors</td>
<td>8</td>
</tr>
<tr>
<td>Executive and Administrative Officers and Staff</td>
<td>9</td>
</tr>
<tr>
<td>Teaching and Research Faculties</td>
<td>11</td>
</tr>
<tr>
<td>Emeritus Faculty</td>
<td>28</td>
</tr>
<tr>
<td>Library Staff</td>
<td>30</td>
</tr>
<tr>
<td>Instructional and Research Assistants</td>
<td>30</td>
</tr>
<tr>
<td>Standing Committees of the Faculty</td>
<td>34</td>
</tr>
<tr>
<td>Administration of Student Affairs</td>
<td>36</td>
</tr>
<tr>
<td>Administration of Business and Financial Affairs</td>
<td>38</td>
</tr>
<tr>
<td>Administration of Development Activities</td>
<td>39</td>
</tr>
<tr>
<td>PART II—INFORMATION</td>
<td>41</td>
</tr>
<tr>
<td>Administrative Organization</td>
<td>42</td>
</tr>
<tr>
<td>Requirements for Admission</td>
<td>43</td>
</tr>
<tr>
<td>Educational Benefits for Veterans</td>
<td>46</td>
</tr>
<tr>
<td>Selective Service Regulations</td>
<td>46</td>
</tr>
<tr>
<td>Expenses</td>
<td>47</td>
</tr>
<tr>
<td>Student Housing</td>
<td>51</td>
</tr>
<tr>
<td>Student Food Service</td>
<td>54</td>
</tr>
<tr>
<td>Student Health Service</td>
<td>55</td>
</tr>
<tr>
<td>Student Financial Aid</td>
<td>56</td>
</tr>
<tr>
<td>Honors and Awards</td>
<td>68</td>
</tr>
<tr>
<td>Guidance Services</td>
<td>77</td>
</tr>
<tr>
<td>Counseling Services</td>
<td>77</td>
</tr>
<tr>
<td>Placement Services</td>
<td>77</td>
</tr>
<tr>
<td>Buildings and Grounds</td>
<td>78</td>
</tr>
<tr>
<td>Reserve Officers' Training Corps</td>
<td>79</td>
</tr>
<tr>
<td>Religious Life</td>
<td>87</td>
</tr>
<tr>
<td>Historical Statement</td>
<td>88</td>
</tr>
<tr>
<td>Location</td>
<td>89</td>
</tr>
<tr>
<td>Alumni Relations</td>
<td>89</td>
</tr>
<tr>
<td>PART III—STUDENT LIFE AND ACTIVITIES</td>
<td>92</td>
</tr>
<tr>
<td>Student Body</td>
<td>92</td>
</tr>
<tr>
<td>Student Government</td>
<td>92</td>
</tr>
<tr>
<td>Clubs and Societies</td>
<td>92</td>
</tr>
<tr>
<td>Architectural Foundation Lectures and Exhibits</td>
<td>96</td>
</tr>
<tr>
<td>University Bands</td>
<td>96</td>
</tr>
<tr>
<td>Concert Series</td>
<td>96</td>
</tr>
<tr>
<td>The Student Center</td>
<td>97</td>
</tr>
<tr>
<td>The Young Men's Christian Association</td>
<td>97</td>
</tr>
<tr>
<td>Automobile Privileges and Parking Regulations</td>
<td>98</td>
</tr>
<tr>
<td>Athletics</td>
<td>98</td>
</tr>
<tr>
<td>PART IV—SCHOLASTIC REGULATIONS</td>
<td>101</td>
</tr>
<tr>
<td>PART V—DEGREES AND CURRICULUMS</td>
<td>111</td>
</tr>
<tr>
<td>Undergraduate Curriculums</td>
<td>113</td>
</tr>
<tr>
<td>Description of Courses</td>
<td>178</td>
</tr>
<tr>
<td>PART VI—PUBLIC SERVICE ACTIVITIES</td>
<td>277</td>
</tr>
<tr>
<td>Personnel</td>
<td>278</td>
</tr>
<tr>
<td>Activities</td>
<td>294</td>
</tr>
<tr>
<td>PART VII—STUDENT REGISTER</td>
<td>301</td>
</tr>
<tr>
<td>INDEX</td>
<td>323</td>
</tr>
</tbody>
</table>
UNIVERSITY CALENDAR

SUMMER SESSIONS 1964

First Session
(Classes meet Monday-Friday except as indicated)
Matriculation, new students .............................................. June 8
Matriculation and registration ........................................... June 9
Classes begin ................................................................. June 10
Classes meet on Saturday ................................................. June 13
Examinations ................................................................. July 15, 16

Second Session
(Classes meet Monday-Saturday)
Matriculation and registration ........................................... July 20
Classes begin ................................................................. July 21
Examinations ................................................................. August 20
Faculty meeting to consider candidates for graduation .......... August 22
Graduation ................................................................. August 22

SESSION 1964-1965

Matriculation, new students .............................................. September 9
Registration, new students ................................................. September 11
Matriculation and registration, current students ................. September 11, 12
Late registration fee applies .............................................. September 14
Classes begin, abbreviated class schedule ......................... September 14
Last day for matriculation ................................................. September 19
Last day to add a subject ................................................. September 26
Last day to drop a subject without record of drop .............. October 10
Last day to order diploma for mid-year graduation ............. October 10
Preliminary reports due ..................................................... October 26
Clemson-Carolina game—classes suspended ......................... November 21
Thanksgiving holidays ...................................................... November 26–28
Last day to drop a subject ................................................. December 9
Last day to withdraw from college without having grades recorded ............................................... December 9
Christmas holidays begin at 1 p.m. .................................... December 19
Classes resume ............................................................... January 4
Examinations begin .......................................................... January 14
Faculty meeting to consider candidates for graduation ......... January 22
Mid-year graduation .......................................................... January 23
Matriculation, new students .............................................. January 25
Registration, all students .................................................. January 27, 28

* Follow Thursday, Friday, Saturday schedule on Monday, Tuesday, Wednesday, November 23, 24, 25.
Late registration fee applies ........................................ January 29
Classes begin, abbreviated class schedule ..................... January 29
Last day for matriculation ........................................ February 4
Last day to add a subject ........................................ February 11
Last day to drop a subject without record of drop .......... February 25
Last day to order diploma for June graduation ............... February 25
Preliminary reports due ........................................... March 15
Easter holidays begin at 1 p. m. ................................ April 15
Classes resume ...................................................... April 21
Last day to drop a subject ....................................... April 27
Last day to withdraw from college without having grades recorded ........................................ April 27
Honors and Awards Day—classes suspended at 12 noon ... May 5
Examinations begin ................................................ May 19
Faculty meeting to consider candidates for graduation ... May 28
Commencement ....................................................... May 29

SUMMER SESSIONS 1965

First Session
(Classes meet Monday-Saturday)
Matriculation, new students ..................................... June 7
Matriculation and registration .................................. June 8
Classes begin ....................................................... June 9
Examinations ....................................................... July 9

Second Session
(Classes meet Monday-Saturday)
Matriculation and registration ................................. July 12
Classes begin ..................................................... July 13
Examinations ....................................................... August 12
Faculty meeting to consider candidates for graduation... August 14
Graduation .......................................................... August 14

SESSION 1965-1966

Matriculation, new students ................................... August 20
Matriculation, current students ................................. August 21
Registration, new students ...................................... August 23
Registration, current students ................................ August 23, 24
Late registration fee applies .................................... August 25
Classes begin, abbreviated class schedule ................... August 25
Last day for matriculation ....................................... August 31
Last day to add a subject ....................................... September 7
Last day to drop a subject without record of drop ......... September 21
Last day to order diploma for mid-year graduation ......... September 21
Preliminary reports due .................................................. October 11
Last day to withdraw from college without
having grades recorded ........................................... November 13
Last day to drop a subject ........................................... November 13
Clemson-Carolina game—classes suspended .............. November 20
Thanksgiving holidays * ........................................ November 25–27
Examinations begin .................................................... December 9
Faculty meeting to consider candidates for graduation December 17
Mid-year graduation .................................................. December 18
Matriculation, new students ........................................ January 10
Registration, all students ........................................... January 12, 13
Late registration fee applies ........................................ January 14
Classes begin, abbreviated class schedule ................ January 14
Last day for matriculation .......................................... January 20
Last day to add a subject ............................................ January 20
Last day to drop a subject without record of drop .... February 10
Last day to order diploma for June graduation .......... February 10
Preliminary reports due ............................................. February 28
Last day to withdraw from college without
having grades recorded ............................................ April 7
Last day to drop a subject ........................................... April 7
Easter holidays begin at 1 p. m. ................................. April 7
Classes resume ......................................................... April 13
Honors and Awards Day—classes suspended at 12 noon April 20
Examinations begin ................................................... May 4
Faculty meeting to consider candidates for graduation May 13
Commencement .......................................................... May 14

SUMMER SESSIONS 1966

First Session
(Classes meet Monday-Saturday)
Matriculation, new students ...................................... May 30
Matriculation and registration .................................. May 31
Classes begin .......................................................... June 1
Examinations ............................................................ July 1

Second Session
(Classes meet Monday-Friday except as indicated)
Matriculation and registration .................................. July 5
Classes begin .......................................................... July 6
Classes meet ........................................................... July 9
Examinations ........................................................... August 10, 11
Faculty meeting to consider candidates for graduation August 13
Graduation ............................................................... August 13

* Follow Thursday, Friday, Saturday schedule on Monday, Tuesday, Wednesday, November 22, 23, 24.
PERSONNEL

Part I
PART I—Personnel

BOARD OF TRUSTEES

LIFE MEMBERS
R. M. Cooper, President of the Board ............... Wisacky, Lee County
Edgar A. Brown ....................................... Barnwell, Barnwell County
James F. Byrnes ........................................ Columbia, Richland County
Winchester Smith ....................................... Williston, Barnwell County
Robert R. Coker ........................................ Hartsville, Darlington County
Frank J. Jervey ......................................... Clemson, Pickens County
James C. Self ........................................... Greenwood, Greenwood County

TERM EXPIRES 1966
A. M. Quattlebaum ..................................... Florence, Florence County
L. D. Holmes ............................................ Johnston, Edgefield County
E. Oswald Lightsey ..................................... Hampton, Hampton County

TERM EXPIRES 1968
Paul Quattlebaum, Jr. ................................ Charleston, Charleston County
W. Gordon McCabe, Jr. ................................. Greenville, Greenville County
T. Kenneth Cribb ....................................... Spartanburg, Spartanburg County

A. W. Rigsby, Secretary ................................ ........ Clemson

BOARD OF VISITORS

1964

E. H. Seim .................................................. Hampton
Grover F. Bowers, Jr. ................................... Estill
Harold S. Musk, Jr. ...................................... Charleston
Tom W. Smith ........................................... Williston
Frank E. Timmerman ...................................... Edgefield
Henry Blohm .............................................. Greenwood
A. A. Watters, Jr. ....................................... Spartanburg
Robert L. Stoddard ...................................... Spartanburg
J. Calvin Rivers .......................................... Chesterfield
William H. Grier ........................................ Rock Hill
David L. White .......................................... Hartsville
James B. Redfearn ....................................... Hartsville

[ 8 ]
EXECUTIVE OFFICERS

Robert Cook Edwards, B.S., LL.D. ...................... President
Jack Kenny Williams, Ph.D. ............ Vice-President for Academic Affairs and Dean of the University
Walter Thompson Cox, B.S. ....................... Dean of Student Affairs
Melford A. Wilson, B.S. in Commerce. ....... Vice-President for Business and Finance and Comptroller
William Wright Bryan, B.S., Litt.D., LL.D., Vice-President for Development

ADMINISTRATIVE OFFICERS AND STAFF

PRESIDENT’S OFFICE

Robert Cook Edwards, B.S., LL.D. ...................... President
Allen Wood Rigsby, M.A., LL.B. ........... Assistant to the President and University Counsel
Virginia Earle Shanklin, A.B. ........... Secretary to the President

ACADEMIC AND RESEARCH ADMINISTRATION

Jack Kenny Williams, Ph.D. ............. Vice-President for Academic Affairs and Dean of the University

COLLEGE OF AGRICULTURE AND BIOLOGICAL SCIENCES *

William Henry Wiley, Ph.D. ............... Dean, College of Agriculture and Biological Sciences
Olen Branford Garrison, Ph.D. . . Director of Agricultural Experiment Station; Director of Research in Agriculture
Jess Willard Jones, Ph.D. ............... Director of Resident Instruction and Assistant to the Dean
William Joseph Lanham, Ph.D. ......... Head, Department of Agricultural Economics and Rural Sociology
Lowery Heywood Davis, Ph.D. ...... Head, Department of Agricultural Education
Absalom West Snell, Ph.D., Head, Department of Agricultural Engineering **
Ulysses Simpson Jones, Ph.D. ...... Head, Department of Agronomy and Soils
Richard Ferman Wheeler, Ph.D. . . . . . . . . . Head, Department of Animal Science
William Monroe Epps, Ph.D. . . . . Head, Department of Botany and Bacteriology
Willis Alonzo King, Ph.D. ............. Head, Department of Dairy Science
James Harvey Cochran, Ph.D. .......... Head, Department of Entomology and Zoology
Woodie Prentiss Williams, Ph.D. ...... Head, Department of Food Science and Biochemistry

Koloman Lehotsky, Ph.D. .................. Head, Department of Forestry
Taze Leonard Senn, Ph.D. ............... Head, Department of Horticulture
Bobby Dale Barnett, Ph.D. ............... Head, Department of Poultry Science

SCHOOL OF ARCHITECTURE

Harlan Ewart McClure, M.Arch., F.A.I.A. . . Dean, School of Architecture

COLLEGE OF ARTS AND SCIENCES

Howard Louis Hunter, Ph.D. ............. Dean, College of Arts and Sciences
Floyd Irving Brownley, Jr., Ph.D. ........ Head, Department of Chemistry and Geology

* See also College of Agriculture and Biological Sciences Staff, including Public Service Activities, on page 277.
** Agricultural Engineering curriculum is jointly administered by the College of Agriculture and Biological Sciences and the College of Engineering.
Headley Morris Cox, Ph.D. .............. Head, Department of English and Modern Languages
Clayton Verl Acouin, Ph.D. .............. Head, Department of Mathematics
Lorenz Ditmar Huff, Ph.D. ............... Head, Department of Physics
Robert Stansbury Lambert, Ph.D. ... Head, Department of Social Sciences
Dewey Ray Franklin, A.B., Lieutenant Colonel, United States Air Force—
Head, Department of Aerospace Studies
Melvin Charles Brown, M.A., Colonel, United States Army—
Head, Department of Military Science

COLLEGE OF ENGINEERING
Linvil Gene Rich, Ph.D. .............. Dean, College of Engineering
Stanley Gosanko Nicholas, B.S. in M.E. ... Director of Engineering Research
Absalom West Snell, Ph.D., Head, Department of Agricultural Engineering
Gilbert Chase Robinson, B.Cer.E. ........ Head, Department of Ceramic and Metallurgical Engineering
Charles Edward Littlejohn, Ph.D. ... Head, Department of Chemical Engineering
Joseph Herbert Moore, Ph.D. ...... Head, Department of Civil Engineering
James Norton Thurston, Sc.D. ....... Head, Department of Electrical Engineering
Douglas Wilson Bradbury, M.S.E. .... Head, Department of Engineering Graphics
Robert Wardlaw Moorman, Ph.D. ... Head, Department of Engineering Mechanics
Everett Laitala, M.E. ............ Head, Department of Industrial Engineering
Alexander Dodge Lewis, M.M.E. ... Acting Head, Department of Mechanical Engineering

SCHOOL OF INDUSTRIAL MANAGEMENT AND TEXTILE SCIENCE
Wallace Dabney Trevillian, Ph.D. ... Dean, School of Industrial Management and Textile Science
Thomas Daniel Efland, M.S. ........ Associate Dean, Director of Research
Clinton Howard Whitehurst, Jr., Ph.D. ....... Head, Department of Industrial Management
Thomas Alexander Campbell, Jr., M.Ed. ... Head, Department of Textiles

GRADUATE SCHOOL
Hugh Holleman Macaulay, Jr., Ph.D. ...... Dean of the Graduate School

SUMMER SESSIONS
Claud Bethune Green, Ph.D. ........ Director of the Summer Sessions and Extended Programs

DIRECTOR OF THE LIBRARY
John Wallace Gordon Gourlay, A.M.L.S. ....... Director of the Library

EDUCATIONAL COUNCIL

* Agricultural Engineering curriculum is jointly administered by the College of Agriculture and Biological Sciences and the College of Engineering.
ROBERT COOK EDWARDS  
President  
B.S., Clemson University; LL.D., The Citadel; LL.D., Wofford College

JACK KENNY WILLIAMS  
Vice-President for Academic Affairs and Dean of the University  
Professor of History  
A.B., Emory and Henry College, 1940; M.A., 1947, Ph.D., 1953, Emory University

ABERNATHY, ATWELL RAY, Assistant Professor of Civil Engineering.  

ACORN, JOHN THOMSON, Assistant Professor of Architecture.  

ADKINS, THEODORE ROOSEVELT, JR., Associate Professor of Entomology and Zoology.  

ALBERT, WILLARD BENJAMIN, Associate Professor of Botany and Bacteriology.  
B.S., 1923, M.S., 1924, Ph.D., 1926, University of Wisconsin.

ALEXANDER, PAUL MARION, Assistant Professor of Botany and Bacteriology.  
B.S., California State Polytechnic College, 1953; M.S., 1955, Ph.D., 1958, Ohio State University.

ALLEN, JOE FRANK, Assistant Professor of Chemistry.  
A.B., Berry College, 1955; M.S., University of Mississippi, 1959; Ph.D., Georgia Institute of Technology, 1963.

ALLEY, FORREST CHRISTOPHER, Associate Professor of Chemical Engineering.  
B.S., 1951, M.S., 1956, Alabama Polytechnic Institute; Ph.D., University of North Carolina, 1962; P. E.

AMUNDSON, RICHARD JAMES, Assistant Professor of History.  

ANDERSON, GRANT WILLIAM, Associate Professor of Zoology and Veterinary Medicine.  
B.S., D.V.M., Iowa State College, 1932; M.S., Virginia Polytechnic Institute, 1934.

ANDREWS, JOHN F., Associate Professor of Civil Engineering.  
B.S.C.E., 1951, M.S., 1953, University of Arkansas.

ANTRIM, JOHN DE COURCY, Assistant Professor of Civil Engineering.  
B.S., Lehigh University, 1956; M.S., 1938, Ph.D., 1964, Purdue University.

ARRINGTON, OTTIE WARD, Instructor in English.  
B.A., Winthrop College, 1934; M.S., Clemson University, 1961.

ASHWORTH, RALPH PAGE, Associate Professor of Botany and Bacteriology.  
B.S., Wake Forest College, 1939; M.A., 1945, Ph.D., 1960, University of North Carolina.

AUCOIN, CLAIRE RUSSELL, Assistant Professor of Mathematics.  
A.B., Shorter College, 1951; M.S., Auburn University, 1954.

AUCOIN, CLAYTON VERL, Head of Mathematics Department and Professor of Mathematics.  
B.A., Louisiana College, 1951; M.S., 1953, Ph.D., 1956, Auburn University; Post Doctorate, Stanford University, 1960-1961.

BAFF, STANLEY, Assistant Professor of Economics.  
B.S., McNeese State College, 1959; M.B.A., Mississippi State University, 1960.

BAILEY, ROY HORTON, JR., Assistant Professor of Chemistry.  
B.S., 1948, Ph.D., 1958, University of North Carolina.

BALL, WALTER LEE, Associate Professor of Electrical Engineering.  
B.E.E., 1949, M.E.E., 1955, Clemson University; P. E.

BANISTER, ROBERT ALLEN, Associate Professor of Engineering Graphics.  
B.S., Clemson University, 1939; M.S., Bradley University, 1949.
12 Teaching and Research Faculties

BARDSELY, CHARLES EDWARD, JR., Associate Professor of Agronomy and Soils.
B.S., University of Rhode Island, 1948; M.S., 1950, Ph.D., 1959, Mississippi State University.

BARDSELY, VIRGINIA OWEN, Assistant Professor of History.
B.A., Mississippi State College for Women, 1928; M.A., University of Mississippi, 1931; Ph.D., Mississippi State University, 1961.

BARLAGE, WILLIAM BERDELL, JR., Associate Professor of Chemical Engineering.
B.S., Lehigh University, 1954; M.Ch.E., University of Virginia, 1955; Ph.D., North Carolina State College, 1960.

BARNES, WILLIAM CARROLL, Superintendent and Professor of Horticulture,
Truck Experiment Station.
B.S., Clemson University, 1931; Ph.D., Cornell University, 1935.

BARNETT, BOBBY DALE, Head of Poultry Science Department; Professor of Poultry Science.
B.S., 1950, M.S., 1954, University of Arkansas; Ph.D., University of Wisconsin, 1957.

BARTMESS, EUGENIE VENTRE, Instructor in Mathematics.
B.S., 1945, M.S., 1949, Louisiana State University.

BAUGHER, DEAN FORREST, * Instructor in Economics.

BAUKNIGHT, LEHMAN M., JR., Associate Professor of Agricultural Economics and Rural Sociology.
B.S., 1935, M.S., 1949, Clemson University.

BAULD, NELSON ROBERT, JR., Associate Professor of Engineering Mechanics.

BECKWITH, WILLIAM FREDERICK, Assistant Professor of Chemical Engineering.

BELL, MARSHALL CORNETT, Associate Professor of Mathematics.
A.B., 1933, M.A., 1936, University of North Carolina.

BETHEL, EDWARD LEE, Associate Professor of Mathematics.
B.A., Southern Methodist University, 1950; M.A., North Texas State University, 1957.

BIGGS, SAMUEL SHIRLEY, Assistant Professor of Aerospace Studies.
Captain, United States Air Force; A.B., East Carolina College, 1956.

BINSSE, MAURIE IRENE, Instructor in Speech and English.

BIRKHEAD, PAUL KENNETH, Instructor in Geology.

BISHOP, CAHIL BARNES, Assistant Professor of Chemistry.
B.S., Clemson University, 1954; Ph.D., Michigan State University, 1959; Post Doctorate, Yale University, 1959.

BISHOP, MURIEL BOYD, Assistant Professor of Chemistry.
B.A., Huntington College, 1952; M.S., Emory University, 1955; Ph.D., Michigan State University, 1958; Post Doctorate, Yale University, 1959.

BOLEN, CLAUDE WALDRON, Professor of History and Government.
A.B., Emory and Henry College, 1931; M.A., 1935, Ph.D., 1941, Duke University.

BOLING, MAX BALLERY, Assistant Professor of Agronomy and Soils.
B.S., Oklahoma State University, 1960, M.S., 1962, Ph.D., 1964, Mississippi State University.

BOND, JOHN HOWARD, Associate Professor of Botany and Bacteriology.
B.S., 1948, M.S., 1949, Louisiana State University.

BOONE, MEHRTITT ANDERSON, Associate Professor of Poultry Science.
B.S., University of Nebraska, 1941; M.S., Michigan State University, 1947; Ph.D., University of Georgia, 1962.

BORGMAN, ROBERT FREDERIC, Associate Professor of Food Science and Biochemistry.

BOWEN, WILLIAM CLAYTON, Associate Professor of Agricultural Education.
B.S., Clemson University, 1932; M.S., Colorado A & M College, 1940.

BOYD, VIRLYN ALEXANDER, Associate Professor of Agricultural Economics and Rural Sociology.
B.S.A., Berry College, 1941; M.S.A., University of Kentucky, 1948.

* On leave.
BRADBURY, DOUGLAS WILSON, Head of Engineering Graphics Department; Professor of Machine Design.
B.M.E., Clemson University, 1940; M.S.E., University of Michigan, 1959; P.E.

BRANDT, GRAYDON WILLIAM, Associate Professor of Dairy Science.
B.S., Ohio State University, 1936; M.S., University of Nebraska, 1938; Ph.D., Ohio State University, 1958.

BRANNOCK, DURANT YORK, Jr., Assistant Professor of French.

BRANNON, CARROLL CLEVELAND, Associate Professor of Dairy Science.
B.S., Clemson University, 1934.

BRATTON, JAMES EDWARD, Assistant Professor of Electrical Engineering.
B.S., Clemson University, 1957; M.S., University of Tennessee, 1958.

BROCK, JOHN LELAND, Professor of Industrial Education.
B.S., Clemson University, 1927; M.A., George Peabody College, 1936.

BROWN, CHARLES QUENTIN, Associate Professor of Geology.
B.A., 1951, M.S., 1953; University of North Carolina; Ph.D., Virginia Polytechnic Institute, 1959.

BROWN, FARRELL BLENN, Assistant Professor of Chemistry.

BROWN, JONAS WILLIAM, Associate Professor of Mathematics.

BROWN, MELVIN CHARLES, Head of Military Science Department; Professor of Military Science.
Colonel, Infantry, United States Army; B.S., United States Military Academy, 1938; M.A., George Washington University, 1961.

BROWN, SUSAN HENRIETTA, Assistant Professor of Economics and Government.
A.B., 1947, LL.B., 1950, University of Georgia.

BROWNLEY, FLOYD IRVING, Jr., Head of Chemistry and Geology Department; Professor of Chemistry.
B.S., Wofford College, 1939; M.S., Virginia Polytechnic Institute, 1941; Ph.D., Florida State University, 1952.

BROYLES, HARMON EUSTACE, Associate Professor of Electrical Engineering.

BRULEY, DUANE FREDERICK, Assistant Professor of Chemical Engineering.
B.S., University of Wisconsin, 1956; M.S., Stanford University, 1959; Ph.D., University of Tennessee, 1963; P.E.

BRUNER, MARLIN HARNER, Associate Professor of Forestry.
B.S., Pennsylvania State College, 1931; M.F., Yale University, 1932.

BURTNER, FRANK ALAN, Professor of Sociology.
B.A., M.A., University of Texas, 1938; Ph.D., University of North Carolina, 1958.

BUTLER, JOHN HARRISON, Director of Bands; Assistant Professor of Music Education.

BUXTON, JAY A., Assistant Professor of Entomology and Zoology.
B.S., Southwest Texas State Teachers College, 1948; M.A., University of Texas, 1950; Ph.D., Ohio State University, 1957.

BYRD, WILBERT PRESTON, Associate Professor of Experimental Statistics.

CALHOUN, RICHARD JAMES, Associate Professor of English.

CAMPBELL, THOMAS ALEXANDER, Jr., Head of Textile Department; Professor of Textiles.

CAPEL, WILLIAM CYLDE, Jr., Assistant Professor of Sociology.
A.B., Washington and Lee University, 1932; M.A., Columbia University, 1933.

CARTER, EUGENE FRANKLIN, Professor of Textiles.
B.S., Clemson University, 1925; M.S., University of Tennessee, 1937.

CARTER, CLIFTON WALKER, Assistant Professor of Engineering Graphics.
B.S., Clemson University, 1933.

* On leave.
CARTER, ROBERT MILES, Assistant Professor of Aerospace Studies.
Captain, United States Air Force; B.S., Clemson University, 1955.

CASKEY, CLAIRE OMAR, Associate Professor of English.

CASTRO, WALTER ERNEST, *Assistant Professor of Engineering Mechanics.

CHAPLIN, ROBERT LEE, JR., Assistant Professor of Physics.
B.S., Clemson University, 1948; M.S., Ph.D., 1962, North Carolina State College.

CHALUPA, WILLIAM VICTOR, Assistant Professor of Dairy Science.
B.S., 1958, M.S., 1959, Ph.D., 1962, Rutgers University; Post Doctorate, Rutgers University, 1962.

CHEN, TING SHU, Instructor in Engineering Graphics.

CHISMAN, JAMES ALLEN, Assistant Professor of Industrial Engineering.
B.S., University of Akron, 1958; M.S., 1960, Ph.D., 1963, State University of Iowa; P.E.

CLEMент, WALTER BATES, Associate Professor of Engineering Graphics.

COCHRAN, JAMES HARVEY, Head of Entomology and Zoology Department; Professor of Entomology and Zoology; State Entomologist.
B.S., Clemson University, 1935; M.S., 1936, Ph.D., 1946, Iowa State College.

COHOON, DANIEL FRED, Superintendent and Associate Professor of Botany and Bacteriology, Edisto Experiment Station.
B.S., University of Western Ontario, 1952; Ph.D., Rutgers University, 1956.

COKER, EDWARD Caleb, JR., Associate Professor of Mathematics.
B.S., University of South Carolina, 1928; M.A., University of North Carolina, 1930.

COKER, WALTER RICHARD, Assistant Professor of Military Science.
Captain, Infantry, United States Army; B.S., Clemson University, 1955.

COLLINS, THomas FRANK, Assistant Professor of Physics.
A.B., Mercer University, 1956; M.S., Clemson University, 1958.

CONIS, JAMES NORMAN, Associate Professor of Modern Languages.
B.S., 1952, M.A., 1959, University of Virginia.

COOK, JAMES CLINTON, JR., Professor of Mechanical Engineering.
B.M.E., 1939, M.M.E., 1951, Clemson University; M.S.E., 1953, Ph.D., 1955, University of Michigan; P.E.

COOL, BINGHAM MERCUR, Associate Professor of Forestry.
B.S., Louisiana State University, 1940; M.S., Iowa State College, 1941; Ph.D., Michigan State University, 1957.

COOLEDGE, HAROLD NORMAN, JR., Associate Professor of Architecture.

COOPER, JAMES BRONAGH, *Associate Professor of Poultry Science.
B.S., 1955, M.S., 1938, University of Kentucky.

CORLEY, EDWARD McCRORY, Assistant Professor of Agricultural Economics and Rural Sociology.
B.S., Colorado State University, 1957; M.S., University of Illinois, 1958; Ph.D., Oklahoma State University, 1964.

COUCH, JAMES HOUSTON, Associate Professor of Industrial Engineering.
B.S., 1941, M.S., 1954, Clemson University.

COX, HEADLEY MORRIS, Head of English and Modern Languages Department; Professor of English.

CRADDOCK, GARNET ROY, Associate Professor of Agronomy and Soils.
B.S., Virginia Polytechnic Institute, 1952; Ph.D., University of Wisconsin, 1955.

CRAIG, JAMES TELFORD, Assistant Professor of Agricultural Engineering.
B.S., Clemson University, 1951; M.S., University of Georgia, 1960.

CRAIG, KIRK ROBINS, Lecturer in Architecture.
B.S., Clemson University, 1951; B.Arch, Cornell University, 1954; M.Arch., Harvard University, 1957.

CREEAR, JOHN HEUGHES, II, Lecturer in Military Science.
Major, Artillery, United States Army; B.S., United States Military Academy, 1953.

* On leave.
Crosby, Carolyn James, Instructor in Zoology.
B.S., College of Charleston, 1947; M.S., Vassar College, 1949.

Davenport, John Douglas, Assistant Professor of Psychology.
B.S., Clemson University, 1943; M.A., Furman University, 1958.

Davis, Cecil Cook, Associate Professor of Industrial Management.

Davis, Lowery Heywood, Head of Agricultural Education Department; Professor of Agricultural Education.
B.S., 1948, M.S., 1952, Alabama Polytechnic Institute; Ph.D., Ohio State University, 1956.

Davis, Ruby Sellers, Assistant Professor of History and Government.
A.B., 1946, M.A., 1947, University of Georgia.

Dean, Jordan Arthur, Associate Professor of Modern Languages.
A.B., Wofford College, 1933; M.A., Vanderbilt University, 1934.

Dees, Jerome Steele, Instructor in English.

Dinwiddie, Joseph Gray, Jr., Professor of Chemistry.
B.S., Randolph-Macon College, 1942; Ph.D., University of Virginia, 1949.

Dinkle, Lowell Kay, Assistant Professor of Engineering Mechanics.
B.S., University of Wichita, 1955; M.S., University of Michigan, 1961.

Drake, Charles Morgan, Instructor in German.

Dreskin, Erving Arthur, Lecturer in Medical Technology; Co-director, School of Medical Technology, Greenville General Hospital.
B.S., 1940, M.D., 1943, Tulane University.

Drew, Leland Overbey, Associate Professor of Agricultural Engineering.
B.S., Clemson University, 1943; M.S., Iowa State College, 1945; Ph.D., Michigan State University, 1963.

Dunkle, Bernard Edward, Associate Professor of Industrial Engineering.
B.S., United States Naval Academy, 1935; M.S., A & M College of Texas, 1956.

Dunkle, Sue King, Assistant Professor of Mathematics.
B.A., Southwestern Louisiana Institute, 1934; M.A., University of Texas, 1936; M.A., Columbia University, 1940.

Edel, William Charles, Assistant Professor of Industrial Management.

Edwards, James Leon, Professor of Mechanical Engineering.
B.M.E., Clemson University, 1941; M.S., Pennsylvania State College, 1951; Ph.D.

Edwards, Robert Lee, Associate Professor of Animal Science.

Eiland, Thomas Daniel, Associate Dean, School of Industrial Management and Textile Science, Director of Research, Professor of Textiles.
B.S., North Carolina State College, 1949; M.S., Georgia Institute of Technology, 1956.

Elrod, Alvon Creighton, Associate Professor of Mechanical Engineering.
B.M.E., 1949, M.M.E., 1951, Clemson University; Ph.D., Purdue University, 1959; Ph.D.

Elrod, William Corbin, Assistant Professor of Mechanical Engineering.

Epps, William Monroe, Head of Botany and Bacteriology Department; Professor of Botany and Bacteriology; State Plant Pathologist.
B.S., Clemson University, 1937; Ph.D., Cornell University, 1942.

Eskey, Elias Benton, Associate Professor of Agronomy and Soils.
B.S., Clemson University, 1943; M.S., Ohio State University, 1951.

Fain, Charles Clifford, Assistant Professor of Ceramic Engineering.
B.Cr.En., 1954, M.S., 1957, Clemson University.

Fanning, James Collier, Assistant Professor of Chemistry.

Farnsworth, Clyde Houston, Jr., Instructor in Economics.
FARRAR, MILTON DYER, Senior Scientist; Professor of Entomology and Zoology.
B.S., Iowa State College, 1925; M.S., South Dakota State College, 1927; Ph.D., Iowa State College, 1933.

FEAR, ARTHUR J., Assistant Professor of Speech.
A.B., DePauw University, 1935; M.A., State University of Iowa, 1939.

FELDER, HERMAN MCDONALD, Jr., Associate Professor of English.
A.B., Wofford College, 1930; M.A., Vanderbilt University, 1937.

FERGUSON, CHARLES HICKLEN, Assistant Professor of Military Science.
Captain, Infantry, United States Army; B.S., Clemson University, 1955.

FERNANDEZ, ELENA GONZALES, Lecturer in Spanish.
B.A., Georgia Middle College, 1942.

FERNANDEZ, GASTON JUAN, Assistant Professor of Spanish.
B.L.S., Instituto de Segunda Enseñanza de Remedios; LL.D., University of Havana, 1942.

FITCH, LEWIS THOMAS, Assistant Professor of Electrical Engineering.

FLATT, JAMES LEVERN, Associate Professor of Mathematics.

FORD, ALLAN THEODORE, Assistant Professor of Military Science.
Major, Armor, United States Army; A.B., North Georgia College, 1952.

FORD, JOHN MARTIN, Associate Professor of Civil Engineering.
B.C.E., Clemson University, 1946; M.S., University of North Carolina, 1950; P.E.

FOSTER, HAROLD HOMER, Associate Professor of Botany and Bacteriology.
A.B., Upper Iowa University, 1927; M.A., University of Nebraska, 1930; Ph.D., University of Wisconsin, 1935.

FOX, RICHARD CHARLES, Associate Professor of Entomology and Zoology.

FRANKLIN, DEWEY R., Head of Aerospace Studies Department; Professor of Aerospace Studies.
Lieutenant Colonel, United States Air Force; A.B., Sacramento State Teachers College, 1953.

FULMER, JOHN PATRICK, Assistant Professor of Horticulture.
B.S., 1953, M.S., 1955, Clemson University.

FULMER, LOUISE GRAY, Instructor in Mathematics.
A.B., Winthrop College, 1937.

GALLIGAN, THOMAS HENRY, Assistant Professor of Aerospace Studies.
Major, United States Air Force; B.S., University of Maryland, 1963.

GAMBRELL, SAMUEL CHESTER, JR. Assistant Professor of Engineering Mechanics.
B.S., 1957, M.S., 1961, Clemson University.

GARNER, THOMAS HAROLD, Assistant Professor of Agricultural Engineering.

GARRISON, OLEN BRANFORD, Director of Agricultural Experiment Station; Director of Research in Agriculture.
B.S., Clemson University, 1933; M.S., Louisiana State University, 1934; Ph.D., Cornell University, 1939.

GENTRY, DAVID RAYMOND, Assistant Professor of Textiles.
B.S., Clemson University, 1955; M.S., Institute of Textile Technology, 1957.

GETTYS, WILLIAM EDWARD, Assistant Professor of Physics.
B.S., 1960, M.S., 1961, Clemson University; Ph.D., Ohio University, 1964.

GIBSON, PHYCE BYRD, Geneticist (USDA), Lecturer in Agronomy and Soils.
B.S., 1938, B.S., 1940, M.S., 1942, Auburn University; Ph.D., University of Wisconsin, 1950.

GILREATH, JOHN ATKINS, Instructor in Physics.
B.S., 1958, M.S., 1960, Clemson University.

GING, JOHN LEONARD, Assistant Professor of Physics.
B.A., Alfred University, 1953; M.S., Carnegie Institute of Technology, 1955; Ph.D., University of North Carolina, 1960.

GIOHOSA, THOMAS ERNEST, Assistant Professor of Military Science.
Major, C.E., United States Army; B.S., Clemson University, 1953; B.S., Missouri School of Mines, 1958.

* On leave.
GODLEY, WILLIE CECIL, Professor of Animal Science.
B.S., Clemson University, 1943; M.S., 1949, Ph.D., 1955, North Carolina State College.

GOLDSMITH, MAURICE, Associate Professor of Textile Chemistry.
B.S., Colby University, 1918; Chemical Engineering, Ecole Nationale Superieure de Chimie, 1921; M.S., Sorbonne University, 1921.

GOODIN, CURTIS PAUL, Associate Professor of Electrical Engineering.
B.S., University of Kentucky, 1948; M.S., Georgia Institute of Technology, 1957.

GORDON, JOHN STARKE, Instructor in Government.

GOSSETT, BILLY JOE, Assistant Professor of Agronomy and Soils.
B.S., University of Tennessee, 1957; M.S., 1959; Ph.D., 1962, University of Illinois.

GRABEN, HENRY WILLINGHAM, Assistant Professor of Physics.
B.S., Birmingham-Southern College, 1957; M.S., 1961, Ph.D., 1962, University of Tennessee.

GREEN, CLAUD BETHUNE, Director of the Summer Sessions and Extended Programs; Professor of English.
B.A., 1935, M.A., 1938, University of Georgia; Ph.D., Duke University, 1953.

GRIFFIN, DEUEL NORTON, Instructor in English.

GRIFFIN, WILLARD STUART, JR., Instructor in Geology.
B.A., 1959, M.S., 1961, University of Virginia.

GUM, COBURN, Assistant Professor of English.

GUNNIN, EMERY AARON, Professor of Architecture.
B.S., Clemson University, 1950.

HALPIN, JAMES EDWIN, Associate Professor of Botany and Bacteriology.
B.S., 1950, M.S., 1951, Ph.D., 1955, University of Wisconsin; Post Doctorate, University of Maryland, Summer, 1963.

HAMILTON, MAX GREENE, Associate Professor of Horticulture, Edisto Experiment Station.
B.S., North Carolina State College, 1949; Ph.D., Cornell University, 1953.

HAMMOND, ALEXANDER FRANCIS, Associate Professor of Engineering Graphics and Machine Design.

HANDLEY, DALE LEE, Assistant Professor of Animal Science.
B.S., Kansas State College, 1951; M.S., A & M College of Texas, 1954.

HARDEN, JOHN CHARLES, JR., Associate Professor of Mathematics.
B.S., Mississippi College, 1947; M.A., University of Tennessee, 1949.

HARE, WILLIAM RAY, JR., Associate Professor of Mathematics.
B.S., Henderson State Teachers College, 1937; M.S., 1959, Ph.D., 1961, University of Florida.

HARRIS, WILLIAM FRANK, Assistant Professor of Military Science.
Major, Artillery, United States Army; B.B.A., University of Oregon, 1949.

HARSHMAN, RICHARD CALVERT, Associate Professor of Chemical Engineering.
B.A., Ohio Wesleyan University, 1947; M.S., 1949, Ph.D., 1951, Ohio State University.

HAYNES, NINA BRYCE, Instructor in English.

HAYES, SIDNEY BROOKS, Assistant Professor of Entomology and Zoology, Pee Dee Experiment Station.
B.S., 1953, M.S., 1958, Auburn University; Ph.D., Clemson University, 1962.

HENNINGSON, ROBERT WALTER, Associate Professor of Dairy Science.

HENRY, LOUIS LEE, Assistant Professor of English.
B.S., Clemson University, 1953; M.A., Florida State University, 1958.

HERLINGER, WILLIAM BILL, Associate Professor of Modern Languages.
L.A.M., University of Vienna, 1929; D.K.F.M., University of Berlin, 1931.

HILL, JAMES RILEY, JR., Assistant Professor of Animal Science, Edisto Experiment Station.
B.S., 1956, M.S., 1958, Clemson University.
HILL, LEWIS EDGAR, Professor of Economics.

HILL, PATRICIA KNEAS, Assistant Professor of History and Government.

HIND, ALFRED THOMAS, Jr., Professor of Mathematics.
A.B., 1934, M.A., 1936, Emory University; Ph.D., University of Georgia, 1952.

HOBBIN, JAMES HARVEY, Professor of Chemistry.
B.S., University of South Carolina, 1939; M.A., 1947, Ph.D., 1953, Emory University.

HODGES, BAXTER HOWARD, Assistant Professor of Chemistry.
B.S., Clemson University, 1933.

HODGES, VERNON SEYMOUR, Associate Professor of Architecture.
S.B., Harvard College, 1934; M.Arch., Harvard University, 1939.

HOEY, STANISLAUS JOHN, Assistant Professor of Military Science.
Captain, Artillery, United States Army; B.S., Mississippi Southern University, 1954.

HOLMAN, HARRIET R., Associate Professor of English.

HOLT, ALBERT HAMILTON, Associate Professor of English.
A.B., 1939, M.A., 1947, University of North Carolina; Ph.D., Vanderbilt University, 1958.

HOOD, CLARENCE ELAM, Jr., Assistant Professor of Agricultural Engineering.

HOVE, HAROLD BURTON, Jr., Lecturer in Architecture.

HUBBARD, JULIUS CLIFFORD, Jr., Associate Professor of Textiles.
B.S., Clemson University, 1942; M.S., Georgia Institute of Technology, 1950.

HUBBARD, JOHN WILLIAM, Assistant Professor of Agricultural Economics and Rural Sociology.
B.S., Berea College, 1944; M.S., 1958, Ph.D., 1962, University of Kentucky.

HUDSON, WILLIAM GARRAUX, Associate Professor of Mechanical Engineering.

HUFF, LORENZ DITMAR, Head of Physics Department; Professor of Physics.
A.B., 1927, M.S., 1928, Oklahoma University; Ph.D., California Institute of Technology, 1931.

HUFFMAN, JOHN WILLIAM, Associate Professor of Chemistry.

HUGHES, MORRIS BURDETTE, Professor of Horticulture, Edisto Experiment Station.
B.S., Michigan State University, 1935; Ph.D., University of California, 1943.

HULBERT, SAMUEL F., Assistant Professor of Ceramic Engineering.

HUNTER, HOWARD LOUIS, Dean, College of Arts and Sciences; Professor of Chemistry.
B.Chem., 1925, Ph.D., 1928, Cornell University; Post Doctorate, Massachusetts Institute of Technology, Summer, 1939.

HUNTER, ROBERT HOWARD, Associate Professor of Architecture.

HURST, VICTOR, Alumni Professor of Dairy Science.
B.S., 1938, M.S., 1940, Rutgers University; Ph.D., University of Missouri, 1948.

IDOL, JOHN LANE, Jr., Assistant Professor of English.
B.S., Appalachian State Teachers College, 1958; M.A., University of Arkansas, 1961.

ISRAEL, CHARLES MONT, Instructor in English.

JACKSON, JAMES LAWRENCE, Assistant Professor of Military Science.
Major, Infantry, United States Army; B.S., United States Military Academy, 1953.

JAMESON, LAKE HUGH, Associate Professor of Engineering Graphics.
B.S., Clemson University, 1942; M.S., North Carolina State College, 1952.

JANZEN, JACOB JOHN, Associate Professor of Dairy Science.
B.S.A., University of Manitoba, 1944; M.S., 1947, Ph.D., 1952, University of Wisconsin; Post Doctorate, University of Wisconsin, 1952-1953.

* On leave.
Jennings, Carroll Wade, Assistant Professor of English.

Jensen, Arthur Kenneth, Assistant Professor of Agricultural Education.
B.S., 1951, M.S., 1956, Ph.D., 1961, University of Wisconsin.

Johnson, James Karl, Jr., Assistant Professor of Mechanical Engineering.
B.M.E., 1930, M.S., 1938, Clemson University; P.E.

Johnson, Lawrence Carl, Assistant Professor of Aerospace Studies.
Captain, United States Air Force; B.S., Fresno State Teachers College, 1951.

Jones, Champ McMillian, Professor of Agronomy and Soils.
B.S., Clemson University, 1939; M.S., Cornell University, 1940; Ph.D., Michigan State College, 1952.

Jones, Jess Willard, Director of Resident Instruction; Professor of Agronomy.
B.S., Clemson University, 1937; M.S., Ph.D., 1953, Cornell University.

Jones, Ulysses Simpson, Head of Agronomy and Soils Department; Professor of Agronomy and Soils.
B.S., Virginia Polytechnic Institute, 1939; M.S., Purdue University, 1942; Ph.D., University of Wisconsin, 1947.

Jutras, Michel Wilfrid, Assistant Professor of Agronomy and Soils.
B.S., University of Massachusetts, 1958; M.S., University of Connecticut, 1961; Ph.D., Iowa State University, 1964.

Kaufmann, Anders J., Assistant Professor of Architecture.

Kelly, James Welsborn, Assistant Professor of Dairy Science.
B.S., 1939, M.S., 1962, Clemson University.

Kenelly, John Willis, Jr., Associate Professor of Mathematics.
B.S., Southeastern Louisiana College, 1957; M.S., University of Mississippi, 1957; Ph.D., University of Florida, 1961.

Kersey, Robert Noel, Jr., Associate Professor of Electrical Engineering.
B.S. in E.E., Georgia School of Technology, 1942; M.S. Clemson University, 1959.

Kilgore, Donald Gibson, Jr., Lecturer in Medical Technology; Co-Director, School of Medical Technology, and Pathologist, Greenville General Hospital.
M.D., Southwestern Medical College of the University of Texas, 1949.

King, Edwin Wallace, Associate Professor of Entomology and Zoology.
B.S., University of Massachusetts, 1941; M.S., Virginia Polytechnic Institute, 1947; Ph.D., University of Illinois, 1951.

King, Willis Alonzo, Head of Department of Dairy Science; Professor of Dairy Science.
B.S., Clemson University, 1936; M.S., 1938, Ph.D., 1940, University of Wisconsin.

Kingsland, Graydon Chapman, Assistant Professor of Botany and Bacteriology.
B.S., University of Vermont, 1952; M.S., University of New Hampshire, 1955; Ph.D., Pennsylvania State University, 1958.

Kirk, Vernon Miles, Professor of Entomology and Zoology, Pee Dee Experiment Station.
B.S., Dickinson College, 1947; Ph.D., Cornell University, 1951.

Kirkley, Francis Edward, Associate Professor of Agricultural Education.
B.S., Clemson University, 1929; M.S., University of Kentucky, 1951.

Kirkwood, Charles Edward, Jr., Associate Professor of Mathematics; Analyst, Computer Center.
A.B., Lynchburg College, 1935; M.S., University of Georgia, 1937.

Klevgard, Paul Albert, Instructor in History.

LaGrone, John Wallace, Associate Professor of Mathematics.
B.S., Clemson University, 1932; M.A., Vanderbilt University, 1934.

Laitala, Everett, Head of Industrial Engineering Department; Professor of Industrial Engineering.

Lambert, Jerry Roy, Assistant Professor of Agricultural Engineering.

Lambert, Robert Stansbury, Head of Social Sciences Department; Professor of History and Government.
LANDER, ERNEST MCPHERSON, JR., Professor of History and Government.
A.B., Wofford College, 1937; M.A., 1939; Ph.D., 1950, University of North Carolina.

LANDERS, KNOX SCHAFFER, Assistant Professor of Chemistry.
B.S., 1951, M.S., 1955, University of Alabama.

LANDRITH, HAROLD FOCHONE, Associate Professor of History and Education; Chairman, Council on Teacher Training.
B.S., Clemson University, 1948; M.A., Vanderbilt University, 1949; Ed.D., University of Houston, 1960.

LANE, CARL LEATON, Assistant Professor of Forestry.

LANHAM, WILLIAM JOSEPH, Head of Agricultural Economics and Rural Sociology Department; Professor of Agricultural Economics and Rural Sociology.

LAROCHE, EVANS ALLEN, Associate Professor of Textiles.
B.S., Clemson University, 1942; M.S., Georgia Institute of Technology, 1951.

LAW, ALBERT GILES, Assistant Professor of Engineering Mechanics.

LAZAR, JAMES TARLTON, Jr., Associate Professor of Dairy Science.
B.S., Clemson University, 1948; M.S., Cornell University, 1949; Ph.D., North Carolina State College, 1955.

LEASE, ELMER JOHN, Professor of Food Science and Biochemistry.
B.S., 1931, M.S., 1933, Ph.D., 1935, University of Wisconsin.

LEFORT, HENRY GERARD, Assistant Professor of Ceramic Engineering.
B.C.E., Clemson University, 1952; M.S.C.E., 1957, Ph.D., 1960, University of Illinois.

LEHOHNY, KOLOMAN, Head of Forestry Department; Professor of Forestry.
Ing., Czechoslovak Technical University, Prague, Czechoslovakia, 1928; Ph.D., University of Michigan, 1934.

LEWIS, ALEXANDER DODGE, Acting Head, Mechanical Engineering Department; Professor of Mechanical Engineering.
B.S. in M.E., University of Tennessee, 1939; M.M.E., Yale University, 1946; P.E.

LINDSTROM, FREDERICK JOHN, Associate Professor of Chemistry.
B.S., 1951, M.S., 1955, University of Wisconsin; Ph.D., Iowa State University, 1959.

LITTLEJOHN, CHARLES EDWARD, Head of Chemical Engineering Department; Professor of Chemical Engineering.
B.S., Clemson University, 1940; M.Ch.E., North Carolina State College, 1941; Ph.D., Virginia Polytechnic Institute, 1952; P.E.

LONG, JIM THOMAS, Associate Professor of Electrical Engineering.
B.E.E., Clemson University, 1943; M.S. in E.E., 1949, Ph.D., 1963, Georgia Institute of Technology.

LUDVIGSEN, BERNHARD, Lecturer in Clinical Chemistry.

LUKAEVSKI, STANLEY MICHAEL, Associate Professor of Mathematics.

MACAULAY, HUGH HOLLEMAN, JR., Dean of the Graduate School; Professor of Economics.
B.S., 1947, M.S., 1948, University of Alabama; Ph.D., Columbia University, 1957.

MCCLAIN, EUGENE FREDHICK, Assistant Professor of Agronomy and Soils.
B.S., University of Idaho, 1954; M.S., University of California, 1956.

MCCLELLAN, HARLAN EWART, Dean, School of Architecture; Professor of Architecture.

MCCONNELL, FREDERICK MC SWAIN, Assistant Professor of Military Science.
Lieutenant Colonel, Infantry, United States Army; B.S., Clemson University, 1950.

McCOY, JACK CLARK, Associate Professor of Civil Engineering.
B.S., The Citadel, 1948; M.S., Massachusetts Institute of Technology, 1949; P.E.

MCUTCHEON, ALAN JOHNSTONE, Associate Professor of Civil Engineering.
B.S., United States Military Academy, 1928; C.E., University of California, 1932.
McElroy, John Harmon, Visiting Instructor in English.

McGarity, Hugh Harris, Professor of Music Education.
B.F.A., 1940, M.F.A., 1946, University of Georgia; Ph.D., Florida State University, 1958.

McGee, Charles McKay, Jr., Associate Professor of English.
A.B., Furman University, 1934; A.M., Duke University, 1941.

McGregor, William Henry Davis, Associate Professor of Forestry.
B.S., Clemson University, 1951; B.S.F. and M.F., University of Michigan, 1953; Ph.D., Duke University, 1958.

McHugh, Carl Manning, Associate Professor of Engineering Graphics and Machine Design.
B.S., Clemson University, 1936; P. E.

McKenna, Arthur Ernest, Senior Professor of Textiles.
Graduate, Rhode Island School of Design, 1922; Bradford-Durfee Textile School, 1925; B.S., Clemson University, 1930; M.S., University of Tennessee, 1933.

Malphrus, Lewis Daniel, Associate Professor of Agricultural Economics and Rural Sociology.
B.S., Clemson University, 1938; M.S., University of Tennessee, 1940; Ph.D., Purdue University, 1954.

Manwiller, Alfred, Associate Plant Breeder, Pee Dee Experiment Station.
B.S., 1938, M.S., 1939, Iowa State College; Ph.D., Pennsylvania State College, 1944.

Marinos, Pete Nick, Assistant Professor of Electrical Engineering.

Marshall, Clifton James, Associate Professor of Architecture.
B.Arch., University of Illinois, 1949; A.I.A.

Martin, John Allen, Jr., Associate Professor of Horticulture.
B.S., Clemson University, 1936.

Martin, John Campbell, Associate Professor of Electrical Engineering.
B.E.E., Clemson University, 1948; M.S., Massachusetts Institute of Technology, 1953; Ph.D., North Carolina State College, 1962.

Marullo, Nicoasio Philip, Assistant Professor of Chemistry.
B.S., Queens College, 1952; Ph.D., Polytechnic Institute of Brooklyn, 1961; Post Doctorate, California Institute of Technology, 1960-1961.

Marvin, John Henry, Jr., Associate Professor of Textiles.
B.S., Clemson University, 1941; M.S., Georgia Institute of Technology, 1960.

Mathews, Andrew Clark, Professor of Botany and Bacteriology.
A.B., 1928, M.A., 1931, Ph.D., 1939, University of North Carolina.

Means, George Calvin, Jr., Professor of Architecture.
B. of Arch., Western Reserve University, 1947; M.Arch., Georgia Institute of Technology, 1955.

Meeks, Charles Davenport, Assistant Professor of Industrial Engineering.
B.M.E., Clemson University, 1942.

Meenaghan, George Francis, Associate Professor of Chemical Engineering.

Merritt, Jane, Instructor in English.

Mickelberry, William Charles, Assistant Professor of Food Science and Biochemistry.
B.S., Washington State University, 1955; M.S., 1960, Ph.D., 1962, Purdue University.

Miles, James Franklin, Associate Professor of Agricultural Economics and Rural Sociology.
A.B., 1938, M.A., 1939, University of South Carolina; Ph.D., Cornell University, 1951; Post Doctorate, Case Institute of Technology, Summer, 1953.

Miller, Donald Picuet, Associate Professor of Physics.
B.S., A & M College of Texas, 1948; M.S., Tulane University, 1952; Ph.D., Polytechnic Institute of Brooklyn, 1962.

Miller, John Edward, Alumni Professor of Physics; President, Faculty Senate.

Miller, Max Gardner, Associate Professor of Physics.
B.S., 1953, Ph.D., 1961, University of North Carolina.

Mitchell, Charlie R., Assistant Professor of Engineering Mechanics.
B.S., Virginia Polytechnic Institute, 1956; M.S.C.E., West Virginia University, 1961.

° On leave.
MITCHELL, Jack Harris, Jr., Professor of Food Science and Biochemistry.  
B.S., Clemson University, 1933; Ph.D., Purdue University, 1941.

MIXON, Robert Floyd, Assistant Professor of Modern Languages.  

MOORE, Joseph Herbert, Head of Civil Engineering Department; Professor of Civil Engineering.  
B.S., The Citadel, 1943; M.S., Pennsylvania State University, 1949; Ph.D., Purdue University, 1961; P. E.

MOORMAN, Robert Wardlaw, Head of Engineering Mechanics Department;  
Professor of Engineering Mechanics.  
B.C.E., Clemson University, 1940; M.S., 1947, Ph.D., 1955, State University of Iowa.

MORGAN, Harvey Eugene, Jr., Assistant Professor of Industrial Education.  
B.S., 1951, M.S., 1956, Clemson University.

MORRIS, Frank P., Lecturer in Architecture.  
Washington and Lee University, 1916-1918.

MUSEN, Harold Louis, Associate Professor, Edisto Experiment Station.  
B.S., Tennessee Polytechnic Institute, 1949; M.S., Alabama Polytechnic Institute, 1951; Ph.D., Rutgers University, 1955.

NEWELL, Leonhard Jackson, Jr., Instructor in History.  

NEWTON, Alfred Franklin, Associate Professor of Industrial Education.  

NICHOLAS, Stanley Gosanko, Director of Engineering Research.  
B.S. in M.E., Northwestern University, 1950.

NICHOLSON, James Harvey, Assistant Professor of Mathematics.  
B.A., Southern Methodist University, 1950; M.A., University of Texas, 1957.

NIXON, Richard Ray, Assistant Professor of Aerospace Studies.  
Captain, United States Air Force; B.S., University of North Carolina, 1956.

NOVACK, Robert Francis, Associate Professor of Engineering Mechanics.  
B.S., Carnegie Institute of Technology, 1948; M.S., University of Pittsburgh, 1952.

O'DELL, Glen Dewitt, Assistant Professor of Dairy Science.  
B.S., 1953, M.S., 1955, Clemson University.

OGLE, Wayne LeRoy, Associate Professor of Horticulture.  
B.S., University of Tennessee, 1948; M.S., University of Delaware, 1950; Ph.D., University of Maryland, 1952.

OLSEN, Norman LaCour, Jr., Assistant Professor of English.  

OLSON, Edward Sture, Associate Professor of Textile Chemistry.  
B.S., 1938, M.S., 1960, Clemson University.

OWENS, Rameth Richard,  Instructor in History.  

OWENS, Walton Harrison, Jr.,  Instructor in Government.  
A.B., Emory University, 1958; M.A., Florida State University, 1961.

OWINGS, Marvin Alpheus, Professor of English; College Marshal.  
A.B., Wofford College, 1931; M.A., 1932, Ph.D., 1941, Vanderbilt University.

PACKER, Myron Alfred, Assistant Professor of Education.  

PAGE, Norwood Rufus, Professor of Agronomy and Soils.  
B.S., Clemson University, 1939; M.S., North Carolina State College, 1941; Ph.D., University of Georgia, 1959.

PALMER, Merrill Craig, Director of Computer Center; Associate Professor of Mathematics.  
B.S., University of Chattanooga, 1947; M.A., Vanderbilt University, 1948.

PARK, Eugene, Associate Professor of Mathematics.  
A.B., University of Georgia, 1939; M.A., Lehigh University, 1941.

PARK, Sang Oh, Assistant Professor of Industrial Management.  

PARKER, Paul Albert, Jr., Assistant Professor of Aerospace Studies.  
Captain, United States Air Force; B.A., State University of Iowa, 1955.

PEARCE, John Franklin,  Assistant Professor of Economics.  

* On leave.
Peele, Thomas Christopher, Professor of Agronomy and Soils.
B.S., North Carolina State College, 1929; Ph.D., Cornell University, 1933.

Perry, Robert Lindsay, Associate Professor of Mechanical Engineering.

Pierce, Harold Hunter, Superintendent, Coast Experiment Station; Assistant Animal Scientist.
B.S., 1943, M.S., 1953, University of Georgia; Ph.D., University of Illinois, 1956.

Pickett, Jerold Franklin, Assistant Professor of Agricultural Economics and Rural Sociology.
B.S., 1951, M.S., 1956, Clemson University.

Pitner, John Bruce, Superintendent and Professor, Pee Dee Experiment Station.
B.S., 1938, M.S., 1939, Mississippi State College; Ph.D., University of Wisconsin, 1944.

Poe, Herbert Vernon, Associate Professor of Electrical Engineering.
B.S., North Carolina State College, 1944; M.S., A & M College of Texas, 1950; P.E.

Polk, Henry Tasker, Professor of Chemistry.
B.S., 1931, M.S., 1933, University of Kentucky; Ph.D., Cornell University, 1938.

Porter, John J., Assistant Professor of Textile Chemistry.
B.S. in Ch.E., 1956, Ph.D., 1960, Georgia Institute of Technology.

Pottz, Glenn Edward, Lecturer in Microbiology.

Prochaska, Bobby Joseph, Instructor in Mathematics.
B.S., University of Southwestern Louisiana, 1963; M.S., Colorado State University, 1964.

Purser, Walter Hugh, Instructor in Entomology.
B.S., 1927, M.S., 1943, Alabama Polytechnic Institute.

Randel, William Claud, Associate Professor of Forestry.
B.S., Purdue University, 1939; M.S., 1940, Ph.D., 1963, New York State College of Forestry.

Reed, Albert Raymond, Associate Professor of Physics
A.B., Wofford College, 1925; M.S., University of South Carolina, 1931.

Reed, Charles Albert, Professor of Physics.
A.B., 1926, M.S., 1929, Ph.D., 1948, University of Oklahoma.

Reed, John Kenneth, Professor of Entomology and Zoology.
B.S., Ohio University, 1942; M.S., 1947, Ph.D., 1954, Iowa State College.

Reel, Jerome Vincent, Jr., Instructor in History.

Reep, Richard T., Assistant Professor of Architecture.
B.Arch., University of Minnesota, 1955; M.Arch., University of Pennsylvania, 1962; A.I.A.

Regnier, Ireland G., Assistant Professor of Architecture.

Reinken, Louis Arthur, Jr., Assistant Professor of Military Science.
Major, Artillery, United States Army; B.S., United States Military Academy, 1950.

Rice, Mary Oni, Instructor in English.

Rich, Linvil Gene, Dean, College of Engineering; Professor of Civil Engineering.
B.S., 1947, M.S., 1948, Ph.D., 1951, Virginia Polytechnic Institute; P.E.

Richardson, Joel Landrum, Associate Professor of Textiles.
B.S., Clemson University, 1942; M.S., North Carolina State College, 1960.

Rife, Lawrence Albert, Associate Professor of Mathematics.
B.Sc., North Dakota Agricultural College, 1940; M.A., University of Nebraska, 1947.

Ringold, May Spencer, Associate Professor of History and Government.
B.A., Mississippi State College for Women, 1936; M.A., University of Mississippi, 1950; Ph.D., Emory University, 1956.

Risko, Marilyn Ann, Instructor in French.

Ritchie, Robert Russell, Professor of Animal Science.
B.S., 1926, M.S., 1938, Iowa State College.

* On leave.
Robbins, Paul Edward, Associate Professor of Textile Chemistry; Chairman, Research Faculty Council.
B.S., University of Pennsylvania, 1952; Ph.D., Georgia Institute of Technology, 1956.

Robbins, Richard Calvin, Jr., Lecturer in Military Science.
Major, Quartermaster, United States Army; B.B.A., University of Texas, 1949.

Roberts, Joel Eno Lyon, Assistant Professor of Military Science.
Captain, Quartermaster, United States Army; A.B., Middlebury College, 1939.

Robinson, Gilbert Chase, Head of Ceramic and Metallurgical Engineering Department; Professor of Ceramic Engineering.
B.C.E.E., North Carolina State College, 1940; P.E.

Rochester, William Frank, Assistant Professor of Electrical Engineering.

Rodgers, John Hasford, Assistant Professor of Agricultural Education.
B.S., 1952, M.S., 1953, Clemson University; Ph.D., Ohio State University, 1961.

Rogers, Ernest Brasington, Jr., Associate Professor of Agricultural Engineering.
B.S., Clemson University, 1948; M.S., A & M College of Texas, 1952; P.E.

Rogers, John David, Assistant Professor of Architecture.
B.Arch., Clemson University, 1958; M.Arch., University of Pennsylvania, 1962; A.I.A.

Rostron, Joseph Prugh, Associate Professor of Civil Engineering.
A.A., Pasadena Junior College, 1935; B.S. in C.E., Southern Methodist University, 1941; M.C.E., Clemson University, 1956; P.E.

Rothenberger, Ray Ralph, Assistant Professor of Horticulture.
B.S., Pennsylvania State University, 1959; M.S., 1961, Ph.D., 1964, University of Missouri.

Rush, John Millard, Professor of Botany and Bacteriology.
A.B., Indiana University, 1928; M.S., Illinois University, 1935; Ph.D., Purdue University, 1947.

Russo, Kenneth, Instructor in Architecture.
B.Arch., Oklahoma State University, 1957; A.I.A.

Rutledge, Ray Watson, Professor of Botany and Bacteriology.
B.S., Union University, 1923; M.A., George Peabody College, 1924; Ph.D., University of Chicago, 1930.

Sack, Ronald Leslie, Assistant Professor of Civil Engineering.

Salley, James Raworth, Jr., Associate Professor of Chemistry.
B.S., College of Charleston, 1937; M.S., Clemson University, 1953.

Sanders, Walter M., III, Visiting Assistant Professor of Civil Engineering.
B.S., Virginia Military Institute, 1953; M.S., 1956, Ph.D., 1964, Johns Hopkins University.

Sappenfield, Charles, Assistant Professor of Architecture.
B.Arch., North Carolina State College, 1956; M.Dipl., Danish Royal Academy, 1961; A.I.A.

Schoenike, Roland Ernst, Associate Professor of Forestry.
B.S., 1951, M.S., 1953, Ph.D., 1962, University of Minnesota.

Schwartz, Arnold Edward, Assistant Professor of Civil Engineering.

Seffick, Harold John, Associate Professor of Horticulture.
B.S., 1935, M.S., 1937, Rutgers University.

Senn, Taze Leonard, Head of Horticulture Department; Professor of Horticulture.
B.S., Clemson University, 1939; M.S., 1950, Ph.D., 1958, University of Maryland.

Shain, William Arthur, Assistant Professor of Forestry.
B.S.F., University of Georgia, 1953; M.F., University of Georgia, 1957; Ph.D., Michigan State University, 1963.

Shapiro, Stephen Leon, Instructor in Economics.

Shewfelt, Albert Lorne, Associate Professor of Food Science and Biochemistry.
B.S.A., University of Manitoba, 1943; M.Sc., University of Alberta, 1948; Ph.D., Oregon State University, 1952.
Shuler, Cyril O., Assistant Professor of Industrial Management.
B.S., Clemson University, 1934; M.Litt., University of Pittsburgh, 1951.

Sims, Ernest Theodore, Jr., Assistant Professor of Horticulture.
B.S.A., University of Georgia, 1954; M.Sc., 1959, Ph.D., 1962, Ohio State University.

Simms, John Barber, Assistant Professor of English.

Sitterly, Wayne Robert, Associate Professor of Botany and Bacteriology,
Truck Experiment Station.
B.S., Iowa State College, 1953; M.S., 1955, Ph.D., 1957, Purdue University; Post Doctorate, University of Maryland, Summer, 1963.

Skardon, Beverly Norton, Instructor in English.
B.S., Clemson University, 1938; M.A., University of Georgia, 1964.

Skelley, George Calvin, Jr., Assistant Professor of Animal Science.
B.S., Panhandle Agricultural and Mechanical College, 1958; M.S., 1960, Ph.D., 1963, University of Kentucky.

Skelton, Billy Ray, Assistant Professor of Economics.
B.S., 1956, M.S., 1958, Clemson University; Ph.D., Duke University, 1964.

Skelton, Bobby Joe, Instructor in Horticulture.
B.S., 1957, M.S., 1960, Clemson University.

Skove, Malcolm John, Associate Professor of Physics.
B.S., Clemson University, 1956; Ph.D., University of Virginia, 1960.

Snell, Absalom West, Head of Agricultural Engineering Department;
Professor of Agricultural Engineering.
B.S., Clemson University, 1949; M.S., Iowa State College, 1952; Ph.D., North Carolina State College, 1964; P.E.

Spencer, Harold Garth, Associate Professor of Chemistry.
B.S.E., 1952, M.S., 1958, Ph.D., 1959, University of Florida.

Spurlock, Hooper Clyde, Associate Professor of Agricultural Economics and Rural Sociology.
B.S., University of Tennessee, 1935; M.S., 1951, Ph.D., 1956, University of Florida.

Stanley, Edward Lemuel, Associate Professor of Mathematics.
B.S., East Tennessee State College, 1930; M.S., University of Tennessee, 1935.

Stanley, William Daniel, Assistant Professor of Electrical Engineering.

Steadman, Mark Sidney, Jr., Associate Professor of English.
A.B., Emory University, 1951; M.A., 1956, Ph.D., 1964, Florida State University.

Stembridge, George Eugene, Assistant Professor of Horticulture.
B.S., Clemson University, 1958; M.S., 1959, Ph.D., 1961, University of Maryland.

Stephens, James Fred, Assistant Professor of Poultry Science.

Stepp, James Marvin, Professor of Agricultural Economics and Rural Sociology.
A.B., Berea College, 1937; M.A., 1938, Ph.D., 1940, University of Virginia.

Stillwell, Ephraim Posey, Jr., Associate Professor of Physics.
B.S., Wake Forest College, 1956; M.S., 1958, Ph.D., 1960, University of Virginia.

Stuart, Charles Morgan, Associate Professor of Mathematics.

Sullivan, John Russell, Associate Professor of Mathematics.
A.B., 1939, M.A., 1949, Georgetown University.

Suman, Reynold Foy, Associate Professor, Edisto Experiment Station.

Talbert, Lonnie Eugene, Assistant Professor of Agricultural Economics and Rural Sociology.
B.S., Arkansas State College, 1939; M.S., Louisiana State University, 1961; Ph.D., North Carolina State, 1964.

Tarrant, William Edward, Sr., Associate Professor of Textiles.

Taylor, Robert Owen, Lecturer in Poultry Science.
B.S., University of Delaware, 1961; M.S., Clemson University, 1963.

Thode, Frederick Wilbur, Associate Professor of Horticulture.
B.S., Clemson University, 1940; M.S., Cornell University, 1951.

* On leave.

• On leave.

26 Teaching and Research Faculties

THOMAS, Richard Bruce, Assistant Professor of Metallurgical Engineering.

THOMPSON, Claude Bryant, Assistant Professor of Economics.
B.S., Alabama Polytechnic Institute, 1932; M.S., Clemson University, 1962.

THOMPSON, Ernis Armenter, Assistant Professor of Economics.

THOMSON, Daniel Park, Jr., Associate Professor of Textiles.

THURSTON, James Norton, Head of Electrical Engineering Department; Professor of Electrical Engineering.
B.S.E., Ohio State University, 1936; S.M., 1943; Sc.D., 1950, Massachusetts Institute of Technology.

TODD, Boyd Joseph, Associate Professor of Agricultural Economics and Rural Sociology.
B.S., 1946, M.S., 1948, Clemson University.

TOMBES, Averett Snead, Assistant Professor of Entomology and Zoology.
B.S., University of Richmond, 1954; M.S., Virginia Polytechnic Institute, 1956; Ph.D., Rutgers University, 1961.

TREVILLIAN, WALLACE DABNEY, Dean, School of Industrial Management and Textile Science; Professor of Economics.
B.S., 1940, M.A., 1947, Ph.D., 1954, University of Virginia.

TRIVELY, Ilo Allely, Professor of Civil Engineering.
B.S. in C.E., 1928, M.S. in C.E., 1941, University of Nebraska; P. E.

TURK, Donald Earle, Assistant Professor of Poultry Science.

TURNISPEDE, Samuel Guy, Assistant Professor of Entomology and Zoology, Edisto Experimental Station.

TUTTLE, Jack Edwin, Associate Professor of History and Government.

ULDRICK, John Paul, Associate Professor of Engineering Mechanics.

USREY, Malcolm Orthell, Assistant Professor of English.

VAIGNEUR, Hugh Oswell, Assistant Professor of Agricultural Engineering.
B.S., 1952, M.S., 1959, Clemson University.

VAN BLARICOM, Lester Oscar, Professor of Horticulture.
B.S., 1938, M.S., 1940, Ph.D., 1954, Oregon State College.

VENKATU, Doulatabad A., Assistant Professor of Metallurgical Engineering.
B.S., University of Mysore, India, 1955; M.S., 1961, Ph.D., 1964, University of Notre Dame.

Vogel, Henriy Elliott, Associate Professor of Physics.
B.S., Furman University, 1948, M.S., 1950, Ph.D., 1962, University of North Carolina.

VON TUNGEIN, George Robert, Associate Professor of Agricultural Economics and Rural Sociology.
B.S., 1951, M.S., 1956, Southern Illinois University.

VULKOVIC, Nicola, Instructor in Economics.

WAGNER, Janet Myers, Instructor in German.
B.A., University of Tennessee, 1963.

WAITE, Edwin Emerson, Jr., Associate Professor of Sociology and Psychology.
B.S., Middlebury College, 1929; M.A., Duke University, 1940.

WALTERS, John Vernon, Associate Professor of Textiles.
B.S., 1933, M.S., 1952, Clemson University.

WANNAMAKER, John Muhray, Assistant Professor of Industrial Management.
B.S., 1950, M.S., 1960, University of South Carolina.

WANNAMAKER, Patricia Walker, Assistant Professor of German.
A.B., 1950, M.A., 1958, University of South Carolina; Ph.D., Louisiana State University, 1964.
WARE, JAMES HAMILTON, JR., Assistant Professor of Philosophy and Religion.

WARE, ROBERT EDWARD, Associate Professor of Entomology and Zoology.
B.S., Iowa Wesleyan College, 1929.

WARNER, JOHN ROBINSON, Associate Professor of Forestry.

WATERS, WASHINGTON MARION, III, Lecturer in Medical Technology.
B.S., Furman University, 1948; M.D., Medical College of South Carolina, 1952.

WATSON, CHARLIE HUGH, Associate Professor of English.

WATSON, SAMUEL McGIVER, JR., Professor of Mechanical Engineering.

WEBB, BYRON KENNETH,* Assistant Professor of Agricultural Engineering.

WEBB, LLOYD GEORGE, Associate Professor of Zoology.
B.S., University of Georgia, 1938; M.S., Alabama Polytechnic Institute, 1941; Ph.D., Ohio State University, 1949.

WHEELER, HARRY OGDEN, Assistant Professor of Food Science and Biochemistry.

WHEELER, HARVEY JAMES, Assistant Professor of Economics.
A.B., University of Maine, 1957.

WHEELER, RICHARD FERMAN, Head of Department of Animal Science; Professor of Animal Science.
B.S., 1941, B.S., 1947, Clemson University; M.S., Mississippi State College, 1949; Ph.D., University of Illinois, 1954.

WHITEHURST, CLINTON HOWARD, JR., Head of Industrial Management Department; Associate Professor of Industrial Management.
B.S., 1957, M.A., 1958, Florida State University; Ph.D., University of Virginia, 1962.

WHITNEY, JOHN BARRY, JR., Professor of Botany and Bacteriology.
B.S., University of Georgia, 1935; M.S., North Carolina State College, 1938; Ph.D., Ohio State University, 1941.

WHITTEN, WILLIAM CLYDE, JR., Associate Professor of Economics.
B.S., Clemson University, 1947; M.S., Georgia Institute of Technology, 1950; Ph.D., University of Alabama, 1964.

WILEY, WILLIAM HENRY, Dean, College of Agriculture and Biological Sciences; Professor of Poultry Science.
B.S., 1936, M.S., 1937, Ph.D., 1949, Texas A & M.

WILLEY, EDWARD PARKER, Assistant Professor of English.

WILLIAMS, EMMETT LEWIS, JR., Research Assistant, Ceramic Engineering.

WILLIAMS, WILLIAM BRATTON, Associate Professor of Textiles.
B.S., 1925, M.S., 1950, Clemson University.

WILLIAMS, WOODIE PRENTISS, Head of Department of Food Science and Biochemistry; Associate Professor of Food Science and Biochemistry.
B.S., 1953, M.S., 1957, Mississippi State University; Ph.D., Texas A & M University, 1960.

WILLIAMSON, ROBERT ELMORE, Instructor in Agricultural Engineering.
B.S., 1959, M.S., 1964, Clemson University.

WILLIS, SAMUEL MARSH, Associate Professor of Industrial Management.
B.S., Clemson University, 1950; M.S., Georgia Institute of Technology, 1955; Ph.D., University of Alabama, 1962.

WILSON, HAROLD BETTS, Admissions Counselor (Textiles); Assistant Professor of Textiles.
B.S., Clemson University, 1941.

WILSON, HUGH HAYNES, Associate Professor of Ceramic Engineering.
B.S., 1948, M.S., 1949, North Carolina State College; Ph.D., Ohio State University, 1954.

WILSON, MILNER BRADLEY, JR., Associate Professor of English.
A.B., Wofford College, 1924; A.M., Columbia University, 1936.

* On leave.
EMERITUS FACULTY

ARMSTRONG, GEORGE MILLER, B.S., M.A., Ph.D., Head Emeritus of Botany and Bacteriology Department; Professor Emeritus of Botany and Bacteriology; Plant Pathologist Emeritus.

ARMSTRONG, PERCY LAMAR, A.B., M.A., Assistant Professor Emeritus of Mathematics.

ARDNT, CHARLES HOMER, A.B., M.S., Ph.D., Plant Pathologist Emeritus.

AULL, GEORGE HUBERT, B.S., M.S., Ph.D., Head Emeritus of Agricultural Economics and Rural Sociology Department; Professor Emeritus of Agricultural Economics and Rural Sociology; Agricultural Economist Emeritus.

BRADLEY, MARK EDWARD, A.B., Head Emeritus of English Department; Professor Emeritus of English.

BROCK, DEWEY CLIFTON, B.S., M.A., Associate Professor Emeritus of Industrial Education.

BROWN, HUGH MONROE, B.A., M.A., Ph.D., Dean Emeritus, School of Textiles.

CARODEMOS, PETER, B.S., Ph.D., Professor Emeritus of Chemistry.

CLARKE, ELWYN LORENZO, B.S. in C.E., C.E., Head Emeritus of Civil Engineering Department; Professor Emeritus of Civil Engineering.

COOPER, HERBERT PRESS, B.S., M.S., Ph.D., Dean Emeritus, School of Agriculture; Director Emeritus of South Carolina Agricultural Experiment Station; Professor Emeritus of Agronomy; Agronomist Emeritus.


CROUCH, SYDNEY JAMES LEONHARDT, B.D., Th.D., L.H.D., Head Emeritus of Religion Department; Professor Emeritus of Religion.


EARLE, SAMUEL BROADUS, A.B., A.M., M.E., LL.D., Dean Emeritus, School of Engineering; Professor Emeritus of Mechanical Engineering; Director Emeritus, Engineering Experiment Station.

EPTING, CARL LAFAYETTE, A.B., A.M., Head Emeritus of Social Sciences Department; Professor Emeritus of History and Government.
Ferrier, Wallace Thomas, A.B., M.S., Ph.D., Professor Emeritus of Agricultural Economics.

Freeman, Edwin Jones, B.S., M.E., M.S., Head Emeritus of Industrial Engineering Department; Professor Emeritus of Metallurgical Engineering.

Gage, Gaston, B.S., M.Ed., Dean Emeritus of the School of Industrial Management and Textile Science; Head Emeritus of Yarn Manufacturing Department; Professor Emeritus of Carding and Spinning.


Goodale, Ben Edmund, B.S., M.S., Head Emeritus of Dairy Science Department; Professor Emeritus of Dairy Science; Dairy Scientist Emeritus.

Green, Joseph Coleman, B.A., M.A., Ph.D., Professor Emeritus of English.

Hall, Evey Eugene, B.S., M.S., Superintendent Emeritus of Pee Dee Experiment Station.

Hodge, Wylie Fort DuPre, Associate Professor Emeritus of Architecture.

Kyzer, Edward Deane, B.S., Superintendent Emeritus of Coast Experiment Station.

LaMaster, Joseph Paul, B.S., M.S., Head Emeritus of Dairy Department; Professor Emeritus of Dairying; Dairy Husbandman Emeritus.

Lane, John Dewey, A.B., M.A., LL.D., Professor Emeritus of English.

Lindsay, Joseph, Jr., A.B., M.S., Head Emeritus of Textile Chemistry and Dyeing Department; Professor Emeritus of Textile Chemistry and Dyeing.

Lindsey, Tate Jefferson, B.A., Ph.D., Professor Emeritus of Physics.

McAdams, William Newton, B.S., M.S., Associate Professor Emeritus of Agricultural Engineering.

Marshall, John Logan, B.S., Head Emeritus of Industrial Arts Department; Professor Emeritus of Industrial Arts.

Mitchell, Jack Harris, B.S., M.S., Professor Emeritus of Chemistry.

Monroe, James Beasley, B.S., M.S., Head Emeritus of Agricultural Education Department; Professor Emeritus of Agricultural Education.

Morgan, Charles Lee, B.S., M.S., Head Emeritus of Poultry Husbandry Department; Professor Emeritus of Poultry Husbandry; Poultryman Emeritus.

Musser, Albert Myers, B.S., Head Emeritus of Horticulture Department; Professor Emeritus of Horticulture; Horticulturist Emeritus.

Paden, William Reynolds, B.S., M.S., Ph.D., Agronomist Emeritus.


Rausch, Karl William, B.S., M.E., Professor Emeritus of Mechanical Engineering.

Rhodes, Sam Roseborough, B.L., M.S., B.S., E.E., Head Emeritus of Electrical Engineering Department; Professor Emeritus of Electrical Engineering.

Rhyne, Orestes Pearl, A.B., A.M., Ph.D., Head Emeritus of Modern Languages Department; Professor Emeritus of Modern Languages.

Riley, James Alvin, B.S., M.S., Superintendent Emeritus of Sandhill Experiment Station; Agronomist Emeritus of Sandhill Experiment Station.

Roderick, Donald Barclay, B.A., Chemistry Assistant Emeritus.

Rogers, William Bryan, B.S., Superintendent Emeritus of Edisto Experiment Station.

Rosenkrans, Duane Benjamin, A.B., M.A., Professor Emeritus of Botany.

St. Hubert, Robert LaMontagne, P.A.G.F., Visiting Professor Emeritus of Architecture.

Shackelford, MacFarland, B.S., Assistant Professor Emeritus of Physics.

Sheldon, Dawson Clement, B.S., M.A., Ph.D., Head Emeritus of Mathematics Department; Professor Emeritus of Mathematics.
SIMPSON, FRANCIS MARION, B.S., Visiting Professor Emeritus of Agricultural Economics.


STRIBLING, BRUCE HOODSON, B.S., M.S., Associate Professor Emeritus of Agricultural Education.

WASHINGTON, WILLIAM HAROLD, B.S., M.S., Dean Emeritus, School of Education; Professor Emeritus of Vocational Education.

WHITE, THOMAS ARLINGTON, B.S., M.S., Ph.D., Professor Emeritus of Agricultural Education.

LIBRARY STAFF

JOHN WALLACE GORDON GOURLAY, A.M.L.S. Director of the Library

SIDELLE BOUKNIGHT ELLIS, B.S. in L.S. Assistant Circulation Librarian

LINDA SMITH GILL, M.A.L.S. Documents Librarian

JOHN GOODMAN, B.S. in L.S. Head, Science, Technology and Agricultural Division

LOIS JONES GOODMAN, B.S. Cataloger

AGNES ADGER MANSFIELD, M.L.S. Cataloger

VIOLET IRENE MENOHER, M.S. Head, Social Sciences and Humanities Division

MARGY H. NOWACK, A.B. Acquisitions Librarian

ELIZABETH G. OBEAR, M.S. Reference Librarian

MURIEL GIPSON RUTLEDGE, B.S. Serials Librarian

MARY CONRAD STEVENSON, A.B. Head, Catalog Department

MARIAN HULL WITHINGTON, M.S. Reference Librarian

INSTRUCTIONAL AND RESEARCH ASSISTANTS

ACOCK, BASIL, M.S. Agronomy and Soils

ADAMS, GEORGE FRANCIS, A.B. Chemistry

ADAMS, JOHN BAILEY, B.S. Dairy Science

ALABRAM, DAVID MAX, M.S. Chemistry

ALFORD, JOHN ASHLEY, B.S. Chemistry

ANDERSON, JACOB CLARENCE, B.S. Mathematics

ASHY, PETER JAWAD, B.S. Mathematics

AYLOTT, MICHAEL VICTOR, B.S. Poultry Science

BAKER, BETTY WHITWORTH, B.A. Mathematics

BARDWELL, DONALD MILTON, B.S. Mathematics

BARNARD, WILLIAM J. O., M/Sgt, U. S. Army Military Science

BETTHEA, THOMAS JESSE, III, B.S. Mechanical Engineering

BISHOP, ASA ORIN, JR., B.S. Electrical Engineering

BISHOP, CLYDE EDWARD, A.B. Chemistry

BISHOP, THOMAS PARKER, M.S. Physics

BLACKWELL, PAUL E., B.S. Horticulture

BLOCK, RONALD EDWARD, B.S. Chemistry

BOARDMAN, CHARLES HARVEY, B.S. Physics

BOWDEN, CHARLES MALCOLM, M.S. Physics

BOWIE, PATRICK CARLTON, B.S. Mathematics

BRANN, IUS MARIE, B.S. Mathematics

BROERSMA, DELMAR BEN, M.S. Entomology and Zoology
<table>
<thead>
<tr>
<th>Name</th>
<th>Degree</th>
<th>Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown, Robert O., Jr.</td>
<td>B.S.</td>
<td>Entomology and Zoology</td>
</tr>
<tr>
<td>Buice, Lemuel Benny</td>
<td>B.S.</td>
<td>Physics</td>
</tr>
<tr>
<td>Burleson, Charles Albertis</td>
<td>M.S.</td>
<td>Agronomy</td>
</tr>
<tr>
<td>Burton, Thomas W., Sgt.-Maj., U. S. Army</td>
<td>B.S.</td>
<td>Military Science</td>
</tr>
<tr>
<td>Byrd, James Cozby, Jr.</td>
<td>M.A.</td>
<td>Physics</td>
</tr>
<tr>
<td>Campbell, Joseph Lytle, III</td>
<td>B.S.</td>
<td>Mechanical Engineering</td>
</tr>
<tr>
<td>Carew, William Ross, Jr.</td>
<td>B.S.</td>
<td>Mechanical Engineering</td>
</tr>
<tr>
<td>Carrow, Charles R.</td>
<td>B.S.</td>
<td>Zoology</td>
</tr>
<tr>
<td>Cartwright, Dennis Hamilton</td>
<td>A.B.</td>
<td>Mathematics</td>
</tr>
<tr>
<td>Castor, Shirley Keaton, A.B.</td>
<td>A.B.</td>
<td>English</td>
</tr>
<tr>
<td>Cecil, Joseph Henry</td>
<td>B.S.</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Chervenak, William James</td>
<td>M.S.</td>
<td>Physics</td>
</tr>
<tr>
<td>Childers, J. Tracy</td>
<td>B.S.</td>
<td>Horticulture</td>
</tr>
<tr>
<td>Christenburg, Gerald D.</td>
<td>B.S.</td>
<td>Agricultural Engineering</td>
</tr>
<tr>
<td>Clayton, William Rufus</td>
<td>B.S.</td>
<td>Agricultural Economics</td>
</tr>
<tr>
<td>Cochran, George Thomas</td>
<td>M.S.</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Crosby, Emory Spear</td>
<td>M.S.</td>
<td>Botany and Bacteriology</td>
</tr>
<tr>
<td>Cunningham, Roger Kenneth</td>
<td>B.S.</td>
<td>Entomology and Zoology</td>
</tr>
<tr>
<td>Curnow, John Wallace</td>
<td>B.S.</td>
<td>Horticulture</td>
</tr>
<tr>
<td>Davis, Jack Hayne</td>
<td>B.S.</td>
<td>Physics</td>
</tr>
<tr>
<td>Davis, Leon W., M.S.</td>
<td>M.S.</td>
<td>Food Science and Biochemistry</td>
</tr>
<tr>
<td>Davis, Joe Bill</td>
<td>M.S.</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Dees, Patricia Ann</td>
<td>B.S.</td>
<td>Entomology and Zoology</td>
</tr>
<tr>
<td>Denit, Jeffery Darlington</td>
<td>B.S.</td>
<td>Agricultural Economics</td>
</tr>
<tr>
<td>Donovan, Edward Warren</td>
<td>B.S.</td>
<td>Poultry Science</td>
</tr>
<tr>
<td>Duncan, Frank Young, Jr.</td>
<td>B.S.</td>
<td>Ceramic Engineering</td>
</tr>
<tr>
<td>Dunkelberg, Dorothy Stuart</td>
<td>B.S.</td>
<td>English</td>
</tr>
<tr>
<td>Durham, George H., Jr.</td>
<td>B.S.</td>
<td>Agricultural Education</td>
</tr>
<tr>
<td>Eggers, John Lardrine</td>
<td>B.S.</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Evans, Noel David</td>
<td>B.A.</td>
<td>History</td>
</tr>
<tr>
<td>Evans, Robert Delwyn, Jr.</td>
<td>B.S.</td>
<td>Physics</td>
</tr>
<tr>
<td>Ezell, William Bruce, Jr.</td>
<td>B.S.</td>
<td>Entomology and Zoology</td>
</tr>
<tr>
<td>Fowler, Ronald Henry</td>
<td>B.S.</td>
<td>Physics</td>
</tr>
<tr>
<td>Funk, Charles Franklin</td>
<td>B.S.</td>
<td>Mechanical Engineering</td>
</tr>
<tr>
<td>Garland, Michael McKee</td>
<td>B.S.</td>
<td>Physics</td>
</tr>
<tr>
<td>Garner, Susan Collins</td>
<td>B.S.</td>
<td>Entomology and Zoology</td>
</tr>
<tr>
<td>Garrett, James Thomas</td>
<td>B.S.</td>
<td>Horticulture</td>
</tr>
<tr>
<td>Giberga, Samuel</td>
<td>B.S.</td>
<td>Chemical Engineering</td>
</tr>
<tr>
<td>Gooch, Dixie R., A.B.</td>
<td>A.B.</td>
<td>English</td>
</tr>
<tr>
<td>Graham, Michael Hugh</td>
<td>B.S.</td>
<td>Mathematics</td>
</tr>
<tr>
<td>Griffin, Nina Freddie</td>
<td>B.A.</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Griffin, Edward W., SFC, U. S. Army</td>
<td>M.S.</td>
<td>Military Science</td>
</tr>
<tr>
<td>Grubman, Adrienne Cecilia</td>
<td>B.S.</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Halfacre, Robert Gordon</td>
<td>B.S.</td>
<td>Horticulture</td>
</tr>
<tr>
<td>Hall, Edwin Platt</td>
<td>M.S.</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Hanks, Francis Joel</td>
<td>B.S.</td>
<td>Agricultural Engineering</td>
</tr>
<tr>
<td>Hayden, Thomas Edgar, Jr.</td>
<td>B.S.</td>
<td>Animal Science</td>
</tr>
<tr>
<td>Heckenback, John Francis</td>
<td>B.S.</td>
<td>Mathematics</td>
</tr>
<tr>
<td>Henderson, Kathy Colvin</td>
<td>B.S.</td>
<td>Horticulture</td>
</tr>
<tr>
<td>Hickerson, James Laurence</td>
<td>B.S.</td>
<td>Mathematics</td>
</tr>
</tbody>
</table>
32 Teaching and Research Faculties

Hill, James Bennett, B.S. ................................................. Physics
Honeycutt, Samuel Carroll, M.S. ...................................... Chemistry
Hooker, Elbert O'Neal, B.S. ........................................... Engineering Mechanics
Houts, Linda Claire, B.S. ............................................... Entomology and Zoology
Hunt, Daniel Harrington, B.S. .......................................... Chemical Engineering
Ibrahim, Ibrahim M., A.B. ............................................. Chemistry
Isaac, Robert Anthony, M.S. .......................................... Chemistry
Jacobs, Glenn Keith, B.A. ............................................. Mathematics
Johnson, William Stanley, B.S. ....................................... Mechanical Engineering
Jones, Emory V., B.S. .................................................. Horticulture
Jones, Rudolph Maurine, B.S. ........................................ Civil Engineering
Kadaster, Mahmut Esat, B.S. ........................................... Civil Engineering
Kambhu, Kawi, B.S. .................................................... Civil Engineering
Kamiya, Takashi, Ph.D. ................................................... Chemistry
Keller, Alton W., B.S. .................................................... Horticulture
Kincaid, Donald Eugene, B.S. ......................................... Physics
King, William Edgar, M.S. ............................................. Entomology and Zoology
Kizer, Rudolph Herman, B.S. .......................................... Ceramic Engineering
Kolaitis, Irene, B.A. ..................................................... Civil Engineering
Kutches, Alexander J., B.S. ........................................... Dairy Science
Kutyna, Francis A., B.S. ................................................ Entomology and Zoology
LaFleur, Kermit Stillman, M.S. ....................................... Agronomy and Soils
Lavker, Robert M., B.S. ................................................ Dairy Science
Lavoie, Donald Arthur, B.S. .......................................... Civil Engineering
Lee, Charles Richard, B.S. ............................................ Agronomy and Soils
Lee, Kwan Moh, B.S. .................................................... Mechanical Engineering
Levallen, Richard Austin, A.B. ....................................... Mathematics
Lewis, Clarence Irvin, B.S. ............................................. Chemical Engineering
Lewis, Francis Elmore, SFC, U.S. Army ............................ Military Science
Lipscomb, Harriett, B.S. ................................................ Botany and Bacteriology
Lloyd, Robert Austin, Jr., B.S. ....................................... Chemistry
Loadholt, Claude Boyd, B.S. .......................................... Agronomy and Soils
Longshore, Randolph Earl, B.S. ..................................... Physics
McCannless, William Voss, B.S. ..................................... Agriculture
McKellar, Richard A., B.S. ............................................. Dairy Science
McSweeney, Albert, M.S. .............................................. Physics
Marchini, Robert Riggs, B.S. .......................................... Physics
Marganian, Vahe Mardiros, M.S. .................................... Chemistry
Marrah, George William, B.S. ....................................... Mathematics
Mayfield, Claud Bert, Jr., B.S. ....................................... Chemistry
Melton, William Copeland, B.S. .................................... Chemistry
Miller, Carol Raymond, M.S. ......................................... Botany
Miller, Lee Stephen, B.S. ............................................. Electrical Engineering
Milligan, Carl William, M.S. ......................................... Chemistry
Moeller, James Richard, B.S. ....................................... Dairy Science
Mole, Marion Leonard, Jr., B.A. .................................... Chemistry
Moorehead, Robert Bernard, Jr., B.S. ............................. Entomology and Zoology
Nesbitt, William Harold, B.S. ....................................... Zoology
Ott, David Albert, B.S. ................................................ Mathematics
<table>
<thead>
<tr>
<th>Name</th>
<th>Degree</th>
<th>Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Padgett, Jack</td>
<td>B.S.</td>
<td>Engineering Mechanics</td>
</tr>
<tr>
<td>Garnett</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pansky, Carol</td>
<td>B.S.</td>
<td>Entomology and Zoology</td>
</tr>
<tr>
<td>Ann</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parekh, Suryakant</td>
<td>B.S.</td>
<td>Chemical Engineering</td>
</tr>
<tr>
<td>Hargovindas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parham, William</td>
<td>M.S.</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Whitfield</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parks, Gordon</td>
<td>B.S.</td>
<td>Physics</td>
</tr>
<tr>
<td>Lee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peeler, George</td>
<td>B.S.</td>
<td>Engineering Mechanics</td>
</tr>
<tr>
<td>Edward</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perkins, John</td>
<td>B.A.</td>
<td>Mathematics</td>
</tr>
<tr>
<td>Cleveland</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Petersen, John</td>
<td>B.S.</td>
<td>Mathematics</td>
</tr>
<tr>
<td>Daniel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phillips, Benjam</td>
<td>B.S.</td>
<td>Agronomy and Soils</td>
</tr>
<tr>
<td>in Henry Jr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pitts, Alfred H.</td>
<td>B.S.</td>
<td>Animal Science</td>
</tr>
<tr>
<td>Jr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillsbury, John</td>
<td>B.S.</td>
<td>Agricultural Engineering</td>
</tr>
<tr>
<td>Leach</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pless, Charles</td>
<td>M.S.</td>
<td>Entomology and Zoology</td>
</tr>
<tr>
<td>D.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poole, Michael</td>
<td>M.Ed.</td>
<td>Mathematics</td>
</tr>
<tr>
<td>Wolfe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Powell, Bobby</td>
<td>B.S.</td>
<td>Physics</td>
</tr>
<tr>
<td>Earl</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Powell, Harry</td>
<td>M.S.</td>
<td>Physics</td>
</tr>
<tr>
<td>Douglas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ramsey, Ralph</td>
<td>B.S.</td>
<td>Agricultural Engineering</td>
</tr>
<tr>
<td>Heywood, III</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reed, William</td>
<td>M.A.</td>
<td>Mathematics</td>
</tr>
<tr>
<td>James</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reiter, Harold</td>
<td>B.S.</td>
<td>Mathematics</td>
</tr>
<tr>
<td>Braun</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice, Thomas</td>
<td>B.S.</td>
<td>Engineering Mechanics</td>
</tr>
<tr>
<td>Morgan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rish, Nelson</td>
<td>B.S.</td>
<td>Seed Certification</td>
</tr>
<tr>
<td>Wayne</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risse, Lawrence</td>
<td>M.S.</td>
<td>Agricultural Economics</td>
</tr>
<tr>
<td>Rogers, Jon</td>
<td>B.S.</td>
<td>Engineering Graphics</td>
</tr>
<tr>
<td>Jon M.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rompola, John</td>
<td>B.S.</td>
<td>Physics</td>
</tr>
<tr>
<td>Ted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rosamond, Herbert</td>
<td>B.S.</td>
<td>Civil Engineering</td>
</tr>
<tr>
<td>D.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shearin, Joan</td>
<td>M.S.</td>
<td>Mathematics</td>
</tr>
<tr>
<td>Brittain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simpson, Hoyle</td>
<td>B.S.</td>
<td>Physics</td>
</tr>
<tr>
<td>Mitchell</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sims, Dohn</td>
<td>B.S.</td>
<td>Electrical Engineering</td>
</tr>
<tr>
<td>Austin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stein, Robert</td>
<td>B.S.</td>
<td>Mathematics</td>
</tr>
<tr>
<td>Emmett, Jr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storey, Stanley</td>
<td>B.S.</td>
<td>Dairy Science</td>
</tr>
<tr>
<td>R.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stout, James</td>
<td>B.S.</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Robert</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suber, Harry</td>
<td>B.S.</td>
<td>Mathematics</td>
</tr>
<tr>
<td>Hammond</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sullivan, James</td>
<td>M.S.</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Kirk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swain, James</td>
<td>B.S.</td>
<td>Agricultural Economics</td>
</tr>
<tr>
<td>William</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swamy, Pandrangi</td>
<td>B.S.</td>
<td>Chemical Engineering</td>
</tr>
<tr>
<td>Appola</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tanner, Gary</td>
<td>B.S.</td>
<td>Entomology and Zoology</td>
</tr>
<tr>
<td>Dale</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taylor, Larry</td>
<td>M.S.</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Thomas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tennant, Jeffrey</td>
<td>B.S.</td>
<td>Engineering Graphics</td>
</tr>
<tr>
<td>Scott</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terapane, John</td>
<td>B.S.</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Francis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thomas, Claude</td>
<td>M.S.</td>
<td>Botany and Bacteriology</td>
</tr>
<tr>
<td>Earle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thompson, Patricia</td>
<td>B.S.</td>
<td>Medical Technology</td>
</tr>
<tr>
<td>Forrester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thorsland, Oscar</td>
<td>A. B.S.</td>
<td>Zoology</td>
</tr>
<tr>
<td>Toda, Fumio</td>
<td>Ph.D.</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Trautner, James</td>
<td>B.S.</td>
<td>Agronomy and Soils</td>
</tr>
<tr>
<td>Lee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tsui, Charles</td>
<td>M.S.</td>
<td>Civil Engineering</td>
</tr>
<tr>
<td>Lee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tyner, Hugh</td>
<td>B.S.</td>
<td>Civil Engineering</td>
</tr>
<tr>
<td>Lamarr, Sr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upchurch, Billy</td>
<td>B.S.</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Thomas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaughn, Charles</td>
<td>B.S.</td>
<td>Physics</td>
</tr>
<tr>
<td>Gilbert</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Teaching and Research Faculties

Vestal, Oliver Hiram, B.S. ............................................ Poultry Science
Wagener, Earl Henry, B.S. ............................................. Chemistry
Walker, Max Winston, B.S. ............................................ Entomology and Zoology
Ward, Archie Basil, B.S. ............................................. Entomology and Zoology
Waters, Luther, Jr., B.S. ............................................. Horticulture
Watson, Jerry Elbert, B.S. ........................................... Civil Engineering
Welborn, William Norman, B.S. ................................... Civil Engineering
Welch, Richard Leonard, B.S. ....................................... Mathematics
Whitesell, James Thomas, B.A. ..................................... Mathematics
Whitson, John Calvin, M.S. .......................................... Physics
Wilkin, Louis Alden, M.S. ............................................ Chemistry
Wilson, Jane Austell, B.S. ........................................... Entomology and Zoology
Winesett, Frank, B.S. .................................................. Mathematics
Winesett, Sarah Hoffmeyer, B.A. .................................... Mathematics
Wingate, James Austin, Jr., B.S. .................................. Engineering Graphics
Wright, Lynn Harvey, M.S. ............................................ Chemistry

STANDING COMMITTEES OF THE FACULTY, 1964-1965

Admissions:

Archives:

Curriculum:
J. K. Williams, ex officio, Chairman; T. A. Campbell, J. W. Jones, A. D. Lewis, M. A. Owings, J. L. Young, H. L. Hunter, ex officio; H. E. McClure, ex officio; J. E. Miller, ex officio; L. G. Rich, ex officio; W. D. Trevillian, ex officio; K. N. Vickery, ex officio; W. H. Wiley, ex officio.

Ethics and Religion:

Faculty Basic Research:
H. H. Macaulay, ex officio, Chairman; C. V. Aucoin, M. A. Boone, F. I. Brownley, C. Gum, C. E. Littlejohn, J. E. Miller, J. K. Reed, B. R. Skelton, H. H. Wilson, M. A. Wilson, ex officio.

Graduate Council:

Honors and Awards:
Honors Program Council:

Lectures:

Library:

Patent:

Schedule:

Social:

Special Advisory Committee for Disposal of Poisonous Chemicals:
H. J. Webb, Chairman; H. T. Polk, P. E. Robbins.

Special Advisory Committee on Use of Radioactive Materials:
J. G. Dinwiddie, Chairman; T. D. Efland, K. Lehotsky, S. G. Nicholas.

FACULTY SENATE

RESEARCH FACULTY COUNCIL
ADMINISTRATION OF STUDENT AFFAIRS

WALTER THOMPSON COX, B.S. ........................................... Dean of Student Affairs
GEORGE EDWARD COAKLEY, B.S. ........................................ Dean of Men
SUSAN GOODWIN DELONY, M.S. ....................................... Dean of Women
VIRGINIA SMITH HARDIE, Ed.D. ........................................ Counseling Psychologist
JOHN RANDOLPH ANDERSON, M.S. .................................... Counselor
HENRY EDWARD FLOREY, JR., M.A. ................................. Resident Counselor

OFFICE OF ADMISSIONS AND REGISTRATION
KENNETH NOTLEY VICKERY, B.S. .................................. Director of Admissions and Registration
REGINALD JUSTIN BERRY, B.S. ....................................... Registrar
WILLIAM RICHARD MATTOX, M.S. .................................. Admissions Supervisor
ARNOLD MANDIGO BLOSS, B.S. ...................................... Student Financial Aid Supervisor
GERTRUDE RAMSAY BAILEY ............................................ Recorder

STUDENT CENTER AND Y. M. C. A.
JOHN R. ROY COOPER, M.A. .......................................... General Secretary, Y. M. C. A.
NASH NEWTON GRAY, B.S. ............................................ Assistant Secretary
OTIS DUELL NELSON, B.D., M.R.E. ................................. Assistant Secretary

Y. M. C. A. ADVISORY BOARD

CHAPLAINS
CHARLES ANTHONY ARRINGTON, S.T.M., D.D. ................. Pastor, Baptist Church
HARRY LAWTON SALISBURY, B.D. .................................. Director of Student Work, Baptist Church
GENEVA NELL METZGER, M.R.E. .................................... Associate Director of Student Work, Baptist Church

PAUL H. LEWIS, C.S.P. ................................................... Pastor, Catholic Church
GEORGE P. LABLANC, C.S.P. ........................................... Newman Club Chaplain, Catholic Church
JOHN W. ARRINGTON, L.Th. .......................................... Rector, Episcopal Church
GEORGE MILTON CRUM, Jr., B.D. .................................. Chaplain, Episcopal Church
ENOCH D. STOCKMAN, B.D. ........................................... Pastor, Lutheran Church
WILLIAM R. KINNETT, B.D. .......................................... Pastor, Methodist Church
RICHARD F. ELLIOTT, Jr., B.D. ...................................... Director, Wesley Foundation, Methodist Church
CHARLES EDWARD RAYNAL, Jr., B.D. ............................. Pastor, Presbyterian Church
SAMUEL WYLIE HOGUE, Jr., B.D. ................................. University Pastor, Presbyterian Church

STUDENT PLACEMENT
DAVIS GREGORY HUGHES, M.Ed. .................................... Director of Placement and Coordinator of Counseling
ATHLETIC STAFF

FRANK JAMES HOWARD, B.S.          Director of Athletics and Head Coach
ROBERT COLE BRADLEY, B.S.          Athletic Publicity Director
FRED CONE, B.S.                     Assistant Coach
H. C. GREENFIELD, M.S.              Track Coach
FRED W. HOOVER, B.S.               Head Trainer
ROBERT MORGAN JONES, B.S.           Assistant Coach
R. P. JORDAN, B.S.                  Assistant Football Coach
GEORGE A. KRAJACK, B.S.             Assistant Basketball Coach
JAMES BANKS MCFADDEN, B.S.          Assistant Coach
H. C. McLELLAN, Jr., M.S.           Assistant Business Manager
CHRISTOPHER COLUMBUS ROBERTS, Jr., A.B. Basketball Coach
ROBERT WILLIAM SMITH, B.S.          Assistant Coach
JAMES DONALD WADE, B.S.             Assistant Coach
CHARLES FLETCHER WALLER, A.B.       Assistant Coach
BILLY HUGH WILHELM, A.B., Baseball Coach and Director of Intramural Sports
EUGENE PERRITT WILLIMON, B.S.       Business Manager

ATHLETIC COUNCIL

R. R. RITCHIE, Chairman; J. E. HALPIN, E. A. LAROCHE, R. W. MOORMAN, T. W. MORGAN, J. L. YOUNG, J. E. MILLER, President, Faculty Senate, ex officio; K. N. VICKERY, Director of Admissions and Registration, ex officio; GOODE BRYAN, Alumni Member; W. G. DESCHAMPS, Alumni Member.

STUDENT HEALTH SERVICE

JUDSON ELAM HAIR, M.D.          Director of Student Health Service
JACK CHARLES BARRETT, M.D.     Associate Director of Student Health Service
ROY JAMES ELLISON, M.D.        Consulting Psychiatrist
EVELYN LITTLETON, R.L.T.        X-ray and Laboratory Technician
RUTH DURHAM, R.N.              Director of Nurses

DEPARTMENT OF BANDS

JOHN HARRISON BUTLER, M.F.A.       Director
ADMINISTRATION OF BUSINESS AND FINANCIAL AFFAIRS

Melford A. Wilson, B.S. in Commerce ........ Vice-President for Business and Finance and Comptroller
Kenney Rixie Helton .................................. Internal Auditor

ACCOUNTING DIVISION
Trescott Newton Hinton, B.A. .......... Chief Accountant
Melvin Eugene Barnette, B.S. .......... Supervisor of Research Accounts
Vivian Raymond Harrell ....................... IBM Supervisor
William Allen Thompson, B.S. .......... Accountant
Joseph Shelor Walker, B.S. ................. Bursar

PERSONNEL DIVISION
John Baker Gentry, Ed.M. ............... Director of Personnel
Charles Wallace Lott ......................... Job Analyst

PHYSICAL PLANT DIVISION
Ralph Simpson Collins, B.E.E., P.E. ........ Director of Physical Plant
James Cleveland Carey, B.S. .............. Superintendent of Grounds
Francis Furman Dean, B.S.M.E., P.E. ........ Superintendent of Planning and Engineering
Willard Lieben Meigs, B.C.E., P.E. ........ Assistant Superintendent of Planning and Engineering
Roy Marcus Rochester, B.E.E. ................ Plant Engineer
George Carlisle Jones, B.S. in E.E. .......... Superintendent of Utilities
Jack William Weeden .......................... Chief of Security

PURCHASING DIVISION
Earl Spencer Liberty, B.A. ............... Director of Purchasing

AUXILIARY ENTERPRISES
Henry Hughes Hill, Jr., B.S. .............. Director of Auxiliary Enterprises
James Pearson Burns ......................... College Photographer
Luther J. Fields, B.S. ......................... Manager, Student Food Service
Sam Hanvey .................................. Supervisor, Central Office Services
Ralph Elmer Layman, B.A. ................ Assistant Dormitory Manager
Thomas Roy Rhymes .......................... Manager, Laundry
Henry Wordsworth Rimmer ................ Manager, Dormitory
Ernest Chisolm Watson, B.S. .............. Manager, Housing

THE CLEMSON HOUSE HOTEL
Frederick Leonard Zink, Jr. ............... Manager
Samuel Wickham Bissell, Jr. ............... Resident Manager

ADMINISTRATIVE COUNCIL
ADMINISTRATION OF DEVELOPMENT ACTIVITIES

William Wright Bryan, B.S., Litt.D., LL.D., Vice-President for Development

PUBLIC AND ALUMNI RELATIONS

Joseph Edgar Sherman, B.S. Director, Public and Alumni Relations
George M. Moore, B.S. Assistant to the Director, Alumni Relations
B. Brent Breedin, B.A. University Editor
Fred C. Mohrmann, B.A. Editor, University News Bureau
Charles B. Cooper, Jr. Alumni Editor

DEVELOPMENT COUNCIL

R. C. Edwards, President; W. W. Bryan, Vice-President for Development; J. K. Williams, W. T. Cox, M. A. Wilson, H. B. Risher, and A. W. Rigsby, Secretary.

CLEMSON ALUMNI ASSOCIATION

1965 Officers

President ....................... William H. Grier, '23 ................ Rock Hill, S. C.
President-Elect .............. Henry C. Coleman, '26 ............ Daytona Beach, Fla.
Vice-President ............... Robert L. Stoddard, '41 .......... Spartanburg, S. C.
Secretary ...................... Joe Sherman, '34 .................. Clemson, S. C.
Treasurer ...................... Trescott Hinton .................. Clemson, S. C.

National Council

<table>
<thead>
<tr>
<th>District</th>
<th>Term Expires</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1966—Edward S. Olson, '38 .................. Clemson, S. C.</td>
</tr>
<tr>
<td>3</td>
<td>1966—John L. Brady, '47 ................. Spartanburg, S. C.</td>
</tr>
<tr>
<td>7</td>
<td>1966—Frampton Durban, '39 .............. Aiken, S. C.</td>
</tr>
<tr>
<td>8</td>
<td>1967—Sam E. McGreggor, '49 ............. Hopkins, S. C.</td>
</tr>
<tr>
<td>9</td>
<td>1967—F. Reeves Gressette, Jr., '54 ...... Orangeburg, S. C.</td>
</tr>
<tr>
<td>13</td>
<td>1967—J. Will Patterson, '30 ............. Charlotte, N. C.</td>
</tr>
<tr>
<td>14</td>
<td>1967—Harold W. Marvin, Jr., '28 ........ Raleigh, N. C.</td>
</tr>
<tr>
<td>18</td>
<td>1965—Scott DuBose, '34 .................. Altadena, Calif.</td>
</tr>
</tbody>
</table>

At-Large — 1965—Henry L. Buchanan, '41 ................ Anderson, S. C. |
Past Vice-President — 1965—Nolan P. Shuler, Jr., '34 ........ Columbia, S. C. |
<table>
<thead>
<tr>
<th>Office</th>
<th>President Name</th>
<th>University</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clemson Foundation—</td>
<td>Patrick N. Calhoun, '32</td>
<td>Charlotte, N. C.</td>
</tr>
<tr>
<td>President</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty Senate —</td>
<td>J. E. Miller</td>
<td>Clemson, S. C.</td>
</tr>
<tr>
<td>President</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research Faculty —</td>
<td>Paul E. Robbins</td>
<td>Clemson, S. C.</td>
</tr>
<tr>
<td>President</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extension Senate —</td>
<td>W. C. Nettles, '30</td>
<td>Clemson, S. C.</td>
</tr>
<tr>
<td>President</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Government—</td>
<td>Thomas J. Bell, '65</td>
<td>Clemson, S. C.</td>
</tr>
<tr>
<td>President</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior Class —</td>
<td>G. Millon Plyler, '65</td>
<td>Clemson, S. C.</td>
</tr>
<tr>
<td>President</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Junior Class —</td>
<td>Joseph L. Waldrep, '66</td>
<td>Clemson, S. C.</td>
</tr>
<tr>
<td>President</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sophomore Class —</td>
<td>W. Michael Click, '67</td>
<td>Clemson, S. C.</td>
</tr>
<tr>
<td>President</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman Class —</td>
<td>Marvin Caughman, '68</td>
<td>Clemson, S. C.</td>
</tr>
</tbody>
</table>
INFORMATION

Part II
PART II—Information

GENERAL INFORMATION

Clemson is a land-grant, state-supported university. Clemson is fully accredited by the Southern Association of Colleges and Schools.

The thirty-five undergraduate and forty-nine graduate curriculums under the Colleges of Agriculture and Biological Sciences, Arts and Sciences, and Engineering and the Schools of Architecture, and Industrial Management and Textile Science form a background of training for the hundreds of occupations and professions in which Clemson graduates engage. The University is organized on a basis whereby it retains a clear entity through the interrelationships of colleges, schools, and departments providing a well-balanced fundamental and general educational program.

The enrollment of Clemson has grown from 446 students at the opening of the University in 1893 to 4,588 for the first semester, 1964-1965. Since the opening of the University, through the second semester 1964-1965, 46,816 students have attended Clemson and of this number 16,660 have been awarded the bachelor’s degree. During this same period, 704 masters’ degrees and 22 Doctor of Philosophy degrees were awarded.

ADMINISTRATIVE ORGANIZATION

The government of the University is vested in a Board of 13 members, including 6 elected by the Legislature and 7 life and self-perpetuating members, in accord with the Clemson will. The President of the University is the chief executive and administrative officer appointed by the Board of Trustees; and under the President there are four areas of administration, each headed by a chief administrative officer responsible to the President. The organizational units under each of these officers are outlined below:

I. Vice-President for Academic Affairs
   and Dean of the University
   A. College of Agriculture and Biological Sciences
   B. School of Architecture
   C. College of Arts and Sciences
   D. College of Engineering
   E. School of Industrial Management and Textile Science
   F. The Graduate School
G. Extended Programs  
H. The University Library  
I. The Summer Sessions  
J. The Computer Center  
K. ROTC  
L. Water Resources Research Institute

II. Dean of Student Affairs  
A. Office of the Dean of Men  
B. Office of the Dean of Women  
C. Office of Admissions, Registration, and Financial Aid  
D. Student Center and Y. M. C. A.  
E. Student Counseling  
F. Student Placement  
G. Athletic Department  
H. Student Health Service  
I. University Bands

III. Vice-President for Business and Finance and Comptroller  
A. Accounting Division  
B. Personnel Division  
C. Physical Plant Division  
D. Purchasing Division  
E. Auxiliary Enterprises  
F. The Clemson House Hotel

IV. Vice-President for Development  
A. Public and Alumni Relations  
B. Planning  
C. Sponsored Research  
D. Fund Development

REQUIREMENTS FOR ADMISSION

To receive consideration for admission to Clemson, the applicant must, as a rule, present a transcript of his high school record giving evidence of graduation with a minimum of sixteen credits, and submit an official copy of his scores for the College Board tests used as an entrance examination. In reaching an admissions decision, the examination scores along with the student's academic preparation, rank-in-class, and the recommendation of the high school principal will be weighed carefully.
In addition, students may qualify for entrance by:

(1) Achieving satisfactory scores on the College Board examinations and presenting a South Carolina High School Certificate (awarded by certificate examination).

(2) Achieving satisfactory scores on the College Board examinations and completing a minimum of 12 high school units. Students in this category must have earned both a high school record and College Board scores that are distinctly above average.

(3) Achieving satisfactory scores on the College Board examinations and meeting the additional requirements for entrance with advanced standing.

As minimum additional criteria, the transfer applicant must present a statement of honorable dismissal from the institution last attended, an original transcript of his record from each college or university attended, and an official statement that he is eligible to return to the institution last attended. Candidates meeting these requirements will then be considered carefully in the light of the quality of their previous record, and work completed in other colleges with a grade at least one letter grade higher than the lowest passing mark will be evaluated in terms of equivalent courses in the curriculum at Clemson selected by the student.

Furthermore, in order for a transfer student to be considered for enrollment, his complete application, including test scores, transcripts and statement of eligibility, must be on file in the Admissions Office at least two weeks prior to the date of desired matriculation. Exception will be made only in the case of a student enrolled in another college who is applying for mid-year entrance.

Finally, various non-intellective factors will be considered in the case of both freshman and transfer applicants about whom it is impossible to make a positive decision on the strength of aptitude and previous academic performance alone.

Although not required, students planning to apply for entrance to Clemson are advised to include in their high school curriculums the following units:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>4</td>
</tr>
<tr>
<td>Algebra</td>
<td>2</td>
</tr>
<tr>
<td>Chemistry</td>
<td>1</td>
</tr>
<tr>
<td>Geometry</td>
<td>1</td>
</tr>
<tr>
<td>Physics</td>
<td>1</td>
</tr>
<tr>
<td>Trigonometry</td>
<td>( \frac{1}{2} )</td>
</tr>
</tbody>
</table>
It is appropriate for students planning to enroll in Agriculture, Biology, Medical Technology, or Pre-Medicine to include biology in their science program.

Application Forms. Forms to be used in applying for admission to the University may be obtained by writing the Office of Admissions and Registration, Clemson University, Clemson, South Carolina.

Entrance Examinations. With the single exception of those who already hold a bachelor’s or higher level degree from an accredited college or university, all candidates for admission to Clemson on the undergraduate level must complete the College Entrance Examination Board Scholastic Aptitude Test. In addition, all candidates, with the exception of those transferring acceptable college credit in mathematics, should take one of the mathematics achievement tests. Although the score earned on either of the mathematics tests will be considered, it is suggested that candidates take the Level I examination. Applicants who have completed the required tests previously are advised that for a fee of $1 and upon request, the College Entrance Examination Board will furnish Clemson an official transcript of scores. Unofficial score reports from other sources are not acceptable.

Freshman applicants may secure a Bulletin of Information and an application for the tests from their local high school principals or guidance counselors. Transfer candidates will often be able to obtain this material from someone in the student personnel division of their present colleges. If this literature is not available locally, the applicant should write to College Entrance Examination Board, Box 592, Princeton, New Jersey (Box 1025, Berkeley 1, California, for Western residents), requesting a Bulletin of Information/Admissions Testing Program.

All candidates are reminded to forward applications for the entrance examinations as indicated in the Bulletin of Information, and not to Clemson University.

Three other very important points are:

1. Be sure to list Clemson on the application for the College Board examinations as one of the schools to receive your scores.

2. Consideration will be given to your examination results only in the event that an official application for entrance to the University is on file in the Admissions Office.

3. Up to five weeks is required for College Board to furnish scores, and you must schedule your tests at a date sufficiently early to allow time for them to be received prior to your anticipated entrance date.
Matriculation. Upon arrival for the opening of the session, new students report to the Office of Admissions and Registration to complete enrollment. A student’s matriculation is equivalent to his pledge to conform to the rules of the institution. Any admission gained or matriculation made irregularly is subject to cancellation.

Students from Other Countries. A limited number of well-qualified students from other countries are accepted. The application for admission must be in English on the official application form furnished by the Office of Admissions and Registration. Official transcripts of all high school and college level work which the applicant has undertaken should accompany the application. They must also complete the entrance examination requirements discussed previously, although in a few unusual cases a substitute examination is authorized.

In addition to academic and personal qualifications equivalent to those required of United States citizens, the applicant from another country is required to submit evidence of his possessing dollar resources adequate without assistance from the University for at least the first year of his course of study, including round trip travel expenses. The University is unable to grant scholarship assistance to students from abroad, and there is little likelihood that any type of employment may be secured.

If accepted, students from other countries should have a minimum of $900 in their possession upon reporting to the University. This amount is sufficient to make the entrance payment which includes tuition, fees, and living expenses for a semester, and for books and supplies. Foreign students will also be required to purchase student accident and health insurance.

EDUCATIONAL BENEFITS FOR VETERANS AND WAR ORPHANS

The Veterans Administration provides educational assistance for veterans and children of deceased or totally disabled veterans who meet requirements of applicable laws and regulations. Any veteran or child of a deceased or totally disabled veteran should communicate with the nearest Veterans Administration office to determine whether or not he is entitled to any educational benefits.

SELECTIVE SERVICE REGULATIONS

Registration. For the benefit of students who become 18 years of age during the school year, provision has been made for such students to register for Selective Service in the Office of Admissions
Deferment. Students enrolled at Clemson who are subject to the provisions of the Selective Service Act may qualify for deferment to continue their education in several ways.

(1) Students enrolled in either Air Force or Army ROTC at Clemson University may be deferred from induction, after their first semester freshman year, until after graduation. Mere enrollment in the ROTC itself is no guarantee against induction. The cadet must further remain in good standing in both military and academic courses and continue to demonstrate his potential for becoming an effective officer.

(2) Any student who is called for induction during his school year is entitled to one statutory postponement to enable him to complete his school year. Thus, a student entering in August and called for induction during the year is deferred to enable him to complete the school year ending in May provided he had not previously received a postponement.

(3) Under present policy, deferment will usually be granted younger students simply by reason of the fact that they are in school.

EXPENSES

Settlement of University Fees. The $50 advance payment of room rent required for room reservation for the fall semester should be sent to the Dormitory Manager's Office with the completed "Student Application for Room Reservation" card. The $50 advance payment of room rent for room reservation is not required for the spring semester. All other transactions relating to payments should be conducted with the Accounting Division. All checks and money orders should be made payable to Clemson University. A personal check given in payment of university expenses which is returned by the bank unpaid, immediately creates an indebtedness to the University and jeopardizes the student's enrollment.

Tuition and fees for the full semester are payable in advance at the beginning of each semester. In addition, one-half of the semester's board and $50 of the semester's room rent are payable at the beginning of each semester. (For the fall semester, those students who have paid the $50 advance payment of room rent by July 15 have dormitory space reserved, and no additional room rent is due at the beginning of the semester.) Payment of the remainder of first semester's room and board is due October 15. Payment of
the remainder of the second semester's room and board is due March 10.

The University reserves the right to adjust charges to current costs.

*Refund of Academic Fees for Students Enrolled for Less than a Full Semester.* No adjustments in charges will be made on a semester's tuition and fees after five weeks from the date classes begin for the semester. Charges for periods of attendance of five weeks or less during a semester shall be made on the following basis:

- Two weeks or less: 20%
- More than 2 but not more than 3 weeks: 40%
- More than 3 but not more than 4 weeks: 60%
- More than 4 but not more than 5 weeks: 80%
- More than 5 weeks: 100%

Special provision has been made for a student who is required to discontinue his enrollment to report for active duty in the Armed Forces of the United States. Such students shall be charged for tuition, maintenance and activity fee, and medical fee on a daily pro rata basis, holidays excepted, instead of the percentage basis stated above, provided that such discontinuance of enrollment is the result of circumstances, conditions, or actions over which the student has no control.

*Refund of Dining Hall and Dormitory Fees.* Specific information relating to living-expense refunds is given in the sections on dormitories and dining hall. However, it is the policy of the University to make refunds of paid unused services on a daily pro rata basis, holidays excepted, provided the unused period is more than 14 consecutive complete days. With regard to the dormitory fee, no refunds are made of the $50 advance payment once a student occupies a room.

*Schedule of Charges.* The schedule of semester charges for full-time students for the 1964-1965 session are as follows:
<table>
<thead>
<tr>
<th></th>
<th>South Carolina Student</th>
<th>Non- Resident Student</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>Tuition</td>
<td>$75.00</td>
<td>$75.00</td>
</tr>
<tr>
<td>Matriculation Fee</td>
<td>5.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Maintenance and Activities Fee</td>
<td>136.00</td>
<td>136.00</td>
</tr>
<tr>
<td>Medical Fee</td>
<td>15.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Library Fee</td>
<td>12.00</td>
<td>12.00</td>
</tr>
<tr>
<td></td>
<td><strong>Sub-Total (Fees only)</strong></td>
<td>$243.00</td>
</tr>
<tr>
<td>Room</td>
<td>110.00-</td>
<td>126.00</td>
</tr>
<tr>
<td></td>
<td>118.00*</td>
<td>118.00*</td>
</tr>
<tr>
<td>Board</td>
<td>190.00</td>
<td>190.00</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>$543.00-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Part-time Students.** Undergraduate students taking less than 12 semester credit hours will be charged each semester according to the following schedule:

<table>
<thead>
<tr>
<th></th>
<th>S. C. Student</th>
<th>Non-Resident Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matriculation Fee (non-refundable)</td>
<td>$5.00</td>
<td>$5.00</td>
</tr>
<tr>
<td>Tuition (per semester hour)</td>
<td>6.00</td>
<td>16.00</td>
</tr>
<tr>
<td>Maintenance and Activities Fee (per semester hour)</td>
<td>10.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Library Fee (per semester hour)</td>
<td>.75</td>
<td>.75</td>
</tr>
</tbody>
</table>

**Auditing.** Charges for auditing are made each semester according to the schedule shown below:

<table>
<thead>
<tr>
<th></th>
<th>S. C. Student</th>
<th>Non-Resident Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition (per semester hour)</td>
<td>$3.00</td>
<td>$8.00</td>
</tr>
<tr>
<td>Maintenance and Activities Fee (per semester hour)</td>
<td>4.50</td>
<td>4.50</td>
</tr>
<tr>
<td>Library Fee (per semester hour)</td>
<td>.75</td>
<td>.75</td>
</tr>
</tbody>
</table>

**Graduate Students.** For further information concerning advanced degrees see *The Graduate Bulletin,* which may be obtained from the Offices of Admissions and Registration or the Dean of the Graduate School.

* Different types of accommodations.

Note: The payment of the medical and dining hall fees are required of all students living in university dormitories. All full-time students are required to pay the medical fee even though they do not reside in university housing facilities.
**Definition of Residence for the Purpose of Determining the Payment of Tuition Fee.** Out-of-state students pay a higher fee for tuition than South Carolina students. All students whose parents have not been domiciled in South Carolina for at least 12 months immediately preceding the day of their first enrollment in the institution shall be termed, for this purpose, to be out-of-state students, with the following exceptions:

(a) Students under 21 years of age who have resided in South Carolina for at least 24 months immediately preceding the day of their first enrollment.

(b) Students 21 years of age or over at the time of their first matriculation who have resided in South Carolina for at least 12 months immediately preceding the day of their first enrollment.

(c) Children of regularly employed Clemson University staff members.

The term "domiciled in South Carolina" means that the student is not in the State primarily to attend the institution and that his abode in South Carolina has not been set up merely as a technical bar to the higher tuition charge. Residence in the State by virtue of attendance in college or temporary military assignments may not be counted as satisfying the requirement for registration as a South Carolina resident.

**Books and Supplies.** The cost of books is not included in the figures given above. The cost of books and supplies at the beginning of the semester will be approximately $35, except for students enrolling in Architecture the cost will be approximately $75.

**Late Registration Fee.** To prevent or reduce the problems incident to late registration, registration schedules are set for specific days, and certain definite procedures are outlined. A student has not completed registration until all of the required steps are taken, the final one being the return of the properly signed Class Registration Card to the Office of Admissions and Registration. Any undergraduate student who fails to register for classes on the prescribed class registration days will be charged a late registration fee of $10. This late registration fee applies to full-time and part-time undergraduate students.

**Student Banking Accounts.** For the convenience of students, the University operates a banking department in the Bursar's Officer where money can be deposited and withdrawn as the occasion may demand. This service is purely local. Students are urged to deposit their money in the bank and not to keep it in their rooms.
Optional Expenses. It is not possible to give an estimate of a student's expenditures for such amusements as dancing, motion pictures, etc. This depends largely upon the disposition of the student. The University endeavors to reduce to a minimum the temptation to spend money needlessly, but the authorities cannot be responsible for a student's private expenditures. This must be a matter between the student and his parents.

Transcripts. Official transcripts of scholastic records are issued on request. One transcript is furnished free; additional copies are issued for $1 each. Remittances for transcripts should be made payable to Clemson University, but should accompany transcript requests and should be mailed to the Office of Admissions and Registration.

STUDENT HOUSING

The University dormitories will accommodate 3,624, two students being assigned to a room. The University also has 397 individual units for its married students. The general policy concerning student housing is that all unmarried undergraduate students live in dormitories.

Application for Dormitories and Advance Payment. An application for dormitory accommodations will be forwarded to those students who are accepted by the University for the fall semester. These applications are to be completed and returned with a $50 advance room payment to the Dormitory Manager's Office at the earliest practicable date.

Students who have made an advance payment and later decide not to enroll or to live in the dormitory may obtain a refund of the advance payment provided notification of intent and request for refund is received by the Dormitory Office prior to July 15. When such notification and refund request is not received by the deadline date, no refund of advance payment will be made.

Refund of the advance payment will not be made to students who apply for assignments after July 15.

Normally, dormitory accommodations are available to those students who enter the University at the beginning of the second semester; therefore, the advance payment is not now required of students entering at this time.

Assignment Preference. Students should indicate on their application their preference of room(s) and roommate. Priority of room assignments is given to continuing students who file application and
make advance room payments during the priority periods established by the Dormitory Office. Preferences will be honored provided space is available in the desired dormitory and the request does not require exceptions to existing assignment procedures.

Notification of Assignments. As soon as room assignments are made, students are advised of the assignment and furnished information regarding occupancy.

Assignment Changes. Students who desire to move from the assigned room may apply at the Dormitory Office to change rooms. A fee of $4 is charged for moving, also charges will be made for students moving from a lower- to a higher-rated room. Rental refunds are made to students moving from a higher- to a lower-rated room on a prorated basis.

Opening and Closing of Dormitories. The University dormitories officially open for undergraduate students at 8 a.m., the day prior to matriculation date for new students and close at 8 p.m., the day scheduled for graduation exercises of the term or semester. Dormitory fees cover only the time between the day before matriculation and the scheduled date of graduation exercises or end of term when no graduation exercises are scheduled.

For official holidays which occur during the course of a semester, the University reserves the right to close certain halls and to require students remaining on the campus to move to another hall for the duration of the holiday period.

Student Responsibility for Damages. The University holds resident students responsible for any damages other than normal wear that occurs to their rooms and furnishings. Damages will be assessed by the University and the student will be billed for repairs or replacements. Students should inform University officials immediately upon occupancy of any conditions reflecting prior damages which have not been corrected.

Responsibility for Student Possessions. Although every precaution is taken to maintain adequate security, the University cannot assume the responsibility for the loss of or damage to student possessions.

Refund of Dormitory Fees. Once a student occupies a dormitory room he is obligated for the first $50 of the semester's room rent. Refunds may be made on a pro rata basis except that no refund shall be made of the initial $50 advance payment. Further, no refund shall be made if the paid unused period is less than 15 consecutive days.
Extra Dormitory Charges. Extra charges are made to students who occupy dormitories before or after the dates established for a semester or term. Rates are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 week</td>
<td>$1.00 per night</td>
<td>$1.00 per night</td>
</tr>
<tr>
<td>One week</td>
<td>$5.50 each</td>
<td>$6.00 each</td>
</tr>
<tr>
<td>One week and part of another week</td>
<td>$5.50 for full week plus $1.00 per night for part of week</td>
<td>$6.00 for full week plus $1.00 per night for part of week</td>
</tr>
</tbody>
</table>

Students who are required by the University to be on campus prior to and after the scheduled term or semester may upon the approval of the Dean of Student Affairs be exempted from paying the extra dormitory charges.

Room Furnishings. The rooms for men are equipped with single-width beds, including bunk-type and single beds, built-in clothes locker, study tables, and chairs. The rooms for women are carpeted and equipped with twin beds, two desks and desk chairs, two chests, book shelves, study lamps and two closets. Students provide their own pillows, bed linens, blankets, towels, and wash cloths.

Reservation of Right to Change Fees and Regulations. The University reserves the right to make changes in its fees, charges, rules, and regulations.

DORMITORIES FOR MEN

Cost per Semester $110 to $118. There are eight dormitories available for housing 3,188 male students. An additional 74-room dormitory is under construction and is scheduled for completion by the beginning of the 1965-1966 school year. The room rent varies from $110 to $118 per semester, depending upon the dormitory facilities.

DORMITORIES FOR WOMEN

Cost per Semester $126. Women students are required to live in University dormitories. The only exceptions are married students, graduate students, those living with close relatives, and those who are 23 years of age or older and who have parental permission and a clear conduct record.

One dormitory for women has been completed and a second is scheduled for completion by the beginning of the 1965-1966 term. Each building is designed with 72 rooms accommodating 144 women.
STUDENT FOOD SERVICE

_Dining Hall: Cost per Semester $190._ The University Dining Hall offers a counter-service cafeteria-type meal to students. Six large counters provide timely service of quality foods.

The semester fee covers the time from day of matriculation through the day scheduled for graduation exercises. These dates are published in the University Calendar. An extra charge is made for meals eaten in the Student Dining Hall prior to the beginning or after the end of a semester or a term. The fee does not cover the cost of any meals a student may be required to eat off campus due to curricular requirements, unless the time exceeds 14 consecutive complete days.

Students who live in the dormitories will be required to pay the Dining Hall fee. Students who live outside the dormitories may take all meals in the Dining Hall if they pay for such meals on a semester or half-semester basis. Commuting students may purchase individual meal tickets at the rate of 65¢ for breakfast, 85¢ for lunch or dinner.

Refund of paid unused services is made on a daily pro rata basis, holidays excepted, provided the unused portion is more than 14 consecutive days.

LAUNDRY–DRY CLEANING

A plant with modern equipment is conveniently located on campus to service the laundry and dry cleaning requirements of the student. Reasonable prices are charged for individual items on a cash-and-carry basis.

The University will not be liable for lost or damaged items unless reported within two days after the delivery date, and then for not more than the actual depreciated value of such articles as have been lost or damaged.

Coin-operated washing machines and dryers are available in the laundry building and several of the dormitories.

MARRIED STUDENT HOUSING

Clemson provides comfortable and economical housing for its married students. There are three housing areas consisting of 247 single Prefab units, 100 East Campus apartments contained in 50 duplex buildings, and 50 Littlejohn apartments in 11 buildings.

All married student housing units have two bedrooms, living room, kitchen and bath. East Campus apartments are the newest units
and are equipped with stove and refrigerator. The Littlejohn apartments and Prefabs are not equipped with stoves and refrigerators.

Booklets describing these facilities are available and will be furnished upon request to the Housing Office of the University. Monthly rental fees are: Prefabs, $30.00; Littlejohns, $36.00 for interior and $39.00 for end units; East Campus, $48.00.

MEDICAL EXAMINATIONS

Medical examinations are required of every new student entering Clemson University for the first time. These examinations must be administered by the student’s own physician or the Health Service of the school from which he graduates or transfers. This examination will be reported on a special form (Medical Examination Report) provided for this purpose by the Director of Admissions and Registration. This form will be sent after provisional acceptance is granted. No new student will receive final acceptance until this certificate is completed and has been received by the Director of the Student Health Service.

The University requires that all new students have a current tetanus toxoid series or booster (within three years), a smallpox vaccination within three years and immunization against poliomyelitis with oral (Sabin) type vaccine. All new students are also required to have a skin test for tuberculosis within one year prior to admission. If this test is positive, a chest X ray is also required. All positive reactors will then be required to have an annual chest X ray. These follow-up X rays after admission will be done at the Student Health Service.

STUDENT HEALTH SERVICE

The Student Health Service is open twenty-four hours daily throughout the entire week when school is in session. Physicians are on duty during the clinic hours and are on call by the nurse on duty for emergencies at other times.

The chief function of the University Physician is to substitute for the family physician while the student is away from home. A specialist will be called in consultation on any case when, in the opinion of the Health Service physician, such action is deemed necessary to assist in the diagnosis or treatment of the patient.

The medical fee paid by each student covers the services of the attending Health Service physician and nursing care for ordinary sicknesses and minor injuries occurring on the campus. Any charges incurred for the service of outside doctors, consultation of specialists,
special nurses, or for medical or surgical attention performed away from the University shall be the responsibility of the student or parents. Expenses for necessary ambulance service is the responsibility of the student or parent.

The Health Service will not notify parents each time a student reports to the infirmary, but in the event of serious illness or injury, parents will be notified as soon as possible.

Clemson University does not assume any responsibility for the care of injuries resulting from accidents that happen away from the campus.

**STUDENT ACCIDENT AND HEALTH INSURANCE**

The Student Government of Clemson University, with the full approval of the Administration, offers a plan of accident and health insurance to Clemson students. The purpose of this insurance is not to replace existing health facilities of the University, but rather to supplement them by insuring the student against major expenses accompanying an unexpected accident or illness.

Each year, prior to the beginning of the fall semester, complete information on this insurance plan will be sent to parents of students.

Any information received by students or their parents concerning student insurance or any other program offered students will have the signature of the appropriate administrator if it has official endorsement.

**UNDERGRADUATE FINANCIAL AID**

**General.** The Office of Student Financial Aid is responsible for coordinating all types of financial assistance administered by the University except those honors and awards which are presented for special achievement and extracurricular grants-in-aid. Currently available financial aids consist of scholarships, student loans, and part-time employment. It must be realized that any program of financial assistance can only be supplementary and that the basic financial responsibility remains that of the applicant and his parents.

**Application Procedure.** Beginning in February of each year all eligible students may apply to the Student Financial Aid Office for any type of financial assistance desired for the coming school year. All application forms must be completed in their entirety as the answer to each question will have meaning to the committee considering the request. All requests—except for part-time employment—must be supported by a parents Confidential Statement filed directly with the College Scholarship Service, Box 176, Princeton,
New Jersey. Action on requests for aid will be based upon scholastic and activity records, eligibility to attend Clemson, and financial resources. Prospective students must complete the entrance examinations and be accepted for admission by the University before final action may be taken upon their requests for aid. Applicants will be notified when they are selected for specific types of assistance and should promptly indicate their acceptance. Further information and application forms may be secured by contacting the Student Financial Aid Office, Tillman Hall, Clemson University, Clemson, South Carolina 29631. Telephone 654-2421, Extension 411 (Area Code 803).

**SCHOLARSHIPS FOR FRESHMEN**

These awards will be based upon high school records, entrance examination scores, and other qualifications established by the selection committees. Completed entrance and scholarship applications, together with a transcript of high school work through the first semester of the senior year, must be submitted by March 1 in order to be considered. Only those College Board Examinations taken in December, January, or March are acceptable for scholarship application purposes.

*Dow Chemical Co. Scholarships.* Two $500 awards are available annually for freshmen majoring in Chemical Engineering. Awarded by Department of Chemical Engineering.

*Jonathan Logan Scholarships.* Two $2,000 awards, to be paid in equal installments during four years of satisfactory undergraduate study, are provided annually by the David Schwartz Foundation to be available to freshmen who enroll in the School of Industrial Management and Textile Science. Awarded by School of Industrial Management and Textile Science.

*R. F. Poole Alumni Scholarships.* To encourage academic excellence, renewable $600 scholarships are awarded annually to incoming freshmen with outstanding academic potential. Awarded by University.

*Sears-Roebuck Agricultural Scholarships.* Seven $300 awards are available annually for freshmen from South Carolina who enroll in the College of Agriculture and Biological Sciences. An additional sophomore award is given the student making the highest scholastic average as a freshman Sears-Roebuck scholar. Awarded by College of Agriculture and Biological Sciences.

*George E. and Leila Giles Singleton Scholarships.* Income from a fund donated by Mr. G. H. Singleton ('19) provides an annual
$300 award for a farm boy who enrolls in the College of Agriculture and Biological Sciences. Residents of Oconee, Pickens, and Anderson counties are eligible, with preference in that order. The award is for an entering freshman and may be renewed for an additional year. Awarded by College of Agriculture and Biological Sciences.

_Smith-Douglass Agricultural Scholarships._ Two $750 awards, to be paid during four years of satisfactory undergraduate study, are available annually for freshmen who enroll in the College of Agriculture and Biological Sciences. Applicants must be residents of one of the following South Carolina counties: Clarendon, Darlington, Dillon, Florence, Georgetown, Horry, Lee, Marion, Marlboro, Sumter, or Williamsburg. Awarded by College of Agriculture and Biological Sciences.

_South Carolina Fresh Fruit and Vegetable Association Scholarship._ A $1,200 award, to be paid during four years of satisfactory undergraduate study, is available annually to a male South Carolinian who enrolls in the Horticulture (Fruit and Vegetable major) curriculum. Awarded by Department of Horticulture.

_South Carolina Pest Control Association Scholarship._ A $150 award is available annually for an Entomology major (entering freshman or upperclassman). Selection is based upon scholarship, leadership, character, and financial need. Awarded by Department of Entomology and Zoology.

_South Carolina Poultry Improvement Association Scholarships._ A $300 award is available annually to a freshman majoring in Poultry Science. An additional $300 award is available each year for a sophomore, junior, or senior. Awarded by Department of Poultry Science.

_J. P. Stevens & Co. Scholarship._ A $2,000 award, to be paid in equal installments during four years of satisfactory undergraduate study, is available annually to a freshman who enrolls in a Textile curriculum. Awarded by School of Industrial Management and Textile Science.

_Western Electric Fund Scholarships._ Two awards consisting of tuition, fees, books, and supplies are available annually for freshmen who enroll in Electrical, Industrial, or Mechanical Engineering, and associated fields. May be renewed if satisfactory progress is made. Awarded by College of Engineering.
SCHOLARSHIPS FOR UPPERCLASSMEN

Recipients of the following awards are generally selected by the scholarship committees in early spring for the following school year. Completed applications must be submitted not later than March 1 to insure consideration.

Agronomy Achievement Award. A $200 scholarship from the National Plant Food Institute, Washington, D.C., is available annually to a rising sophomore who by leadership, scholarship, and character manifestations during his first year at Clemson has demonstrated that he has the potential to become an outstanding Clemson agronomy major. Awarded by Department of Agronomy and Soils.

Borden Agricultural Scholarship. A $300 award is made annually to that rising senior in the College of Agriculture and Biological Sciences, having the highest cumulative grade-point ratio, who has earned a B grade or higher on at least a total six credits in any junior or senior Dairy Science courses. Awarded by College of Agriculture and Biological Sciences.

Burlington Industries Foundation Scholarship. A $1,000 award, to be paid in equal installments during the last two years of satisfactory undergraduate study, is available annually to a rising junior enrolled in a Textile curriculum. Recipient must maintain a scholastic average in the upper third of his class. Awarded by School of Industrial Management and Textile Science.

Carolinas Ginners Association Scholarship. A $350 award is available annually to a junior or senior enrolled in the College of Agriculture and Biological Sciences. Selection is based upon scholarship, leadership, character, and financial need. Awarded by College of Agriculture and Biological Sciences.

Chemstrand Scholarship. A $500 award is available annually to a rising junior majoring in Textile Science and planning a career in industry. Selection is based upon scholarship, financial need, and extracurricular activity. Awarded by School of Industrial Management and Textile Science.

Coburg Dairy Scholarship. A $1,000 award, to be paid in equal installments during the last two years of satisfactory undergraduate
study, is available annually to a rising junior majoring in Dairy Science. Selection is based upon scholarship, leadership, character, and financial need. Awarded by Department of Dairy Science.

Gilbeart H. Collings Memorial Scholarship. A $600 award to be paid in equal installments during the last two years of satisfactory undergraduate study, is available each year to a rising junior majoring in Agronomy. Selection is based upon scholarship, leadership, character, and financial need. Awarded by Department of Agronomy and Soils.

Ethyl Corporation Scholarship. A $500 award is available annually for a student majoring in Chemical Engineering. Selection is based upon scholastic ability and financial need. Awarded by Department of Chemical Engineering.

Forbes Chocolate Scholarship A $150 award is available annually to a sophomore majoring in Dairy Science. Selection is based upon scholarship, leadership, character, and financial need. Awarded by Department of Dairy Science.

Foundry Educational Foundation Scholarships. Funds made available by grants from the Foundation provide one or more annual awards to students taking organized programs applicable to the casting of metals and foundry technology. Awarded by Department of Industrial Engineering.

Ben and Kitty Gossett Scholarship. Income from their contribution provides one or more annual awards for Textile students whose families are employed by the textile industry in South Carolina. Awarded by School of Industrial Management and Textile Science.

Pauline Hanckel Dairy Scholarship. A $1,000 award, to be paid in equal installments during the last two years of satisfactory undergraduate study, is provided annually by the Ladies Auxiliary of the South Carolina Dairy Association to be available to a rising junior majoring in Dairy Science. Selection is based upon scholarship, leadership, character, and financial need. Awarded by Department of Dairy Science.

Higgins Undergraduate Scholarships. Income from a fund donated by Mr. Higgins provides several annual awards for undergraduate students enrolled in the College of Engineering. Selection is based upon scholarship and need. Awarded by College of Engineering.

David Jennings ('02) Memorial Scholarship. Income from a fund donated by members of his family provides one or more annual awards for deserving undergraduates. Preference is given students

**Sherwood E. Liles (’00) Engineering Scholarship.** Income from a fund donated by his four sons provides an annual tuition award for a deserving undergraduate enrolled in the College of Engineering. Awarded by College of Engineering.

**Minnesota Mining & Manufacturing Company Scholarships.** Two $500 scholarships are awarded to students in the College of Engineering who have satisfactorily completed 50 to 75 credits at Clemson. Selections will be made from the top ten scholars in the College of Engineering. In addition to the scholastic requirement, selections will be based upon character and demonstrated leadership abilities. Awarded by College of Engineering.

**Owens-Corning Fiberglas Scholarships.** Two $500 awards (one in Ceramics) are available annually to rising juniors or seniors majoring in Engineering or Textiles. Selection is based upon academic ability, leadership qualities, and financial need. Awarded by University.

**Peace Fund Scholarship.** A $500 award is available annually to a rising junior or senior. Selection is based upon journalistic ability, scholastic achievement, and evidence of good character. Awarded by University.

**Pennsylvania Glass Sand Scholarship.** A tuition award is given annually to an outstanding rising senior majoring in Ceramic Engineering. Selection is based upon scholastic achievement. Awarded by Department of Ceramic and Metallurgical Engineering.

**Ralston Purina Scholarship.** A $500 award is given annually to a rising senior enrolled in the College of Agriculture and Biological Sciences. Selection is based upon scholarship, leadership, character, extracurricular activities, sincerity of purpose in agriculture, and financial need. Awarded by College of Agriculture and Biological Sciences.

**J. C. Rich (’13) Agriculture Scholarship.** Income from a fund donated by his sister provides an annual award for a deserving male undergraduate enrolled in the College of Agriculture and Biological Sciences. Preference is given relatives. Awarded by College of Agriculture and Biological Sciences.

**Schlumberger Collegiate Award.** A $500 scholarship is available annually to a rising junior or senior majoring in Physics, Electrical Engineering, or Mechanical Engineering, who will take at least 12 credits in Electrical Engineering or Electronics. Selection is based
upon academic standing and leadership ability. Awarded by University.

*Seydel-Wooley & Company Scholarship.* A $300 award is available annually to a rising junior or senior male student majoring in Textiles. Selection is based upon scholastic ability, evidence of leadership, potential to the Southern textile industry, and financial need. Awarded by School of Industrial Management and Textile Science.

*Sonoco Products Scholarships.* Two $500 awards are available annually for deserving undergraduates majoring in Textiles. Awarded by School of Industrial Management and Textile Science.

*South Carolina Association of County Road Officials.* A $500 award is available annually to a rising sophomore majoring in Civil Engineering. Selection is based upon scholastic ability, financial need, interest in extracurricular activities, and personality. Awarded by Department of Civil Engineering.

*South Carolina Dairy Association Scholarships.* A $1,000 award, to be paid in equal installments during the last two years of satisfactory undergraduate study, is available annually to a rising junior from South Carolina majoring in Dairy Science. Selection is based upon scholarship, leadership, character, and financial need. Awarded by Department of Dairy Science.

*United States Rubber Foundation Scholarship.* An $800 award, to be paid in equal installments during the last two years of satisfactory undergraduate study, is available annually to a rising junior planning a career in industry. Selection is based upon proven scholastic ability and financial need. Awarded by University.

FINANCIAL AID FOR GRADUATE STUDY

*Research and Teaching Assistantships* are available to outstanding graduate students. Teaching assistantships are normally awarded for the academic year while research assistantships may be granted for periods of twelve months. Both are renewable. Stipends range from $1,900 to $4,000 and tuition is reduced. Application forms are obtainable from the Dean of the Graduate School or from department heads and should be completed and filed early in the academic year before the student expects to enroll in the Graduate School. Recipients of assistantships are selected by the respective academic departments and will be notified on or before April 15.

*Graduate Fellowships* and *Grants-in-Aid* are also available. Among them are the following:
Alumni Fellowships, ranging from $200 to $1,200, are awarded in all fields of study. These fellowships are made possible through gifts to the Alumni Loyalty Fund.

American Zinc Institute Fellowship. An award of $2,400 to a student in Ceramic Engineering.

The Alexander P. and Lydia Anderson Fellowship. A $350 award for study in the biological sciences.

Stuart F. Brown Fellowship. A $1,000 award to a student in the School of Industrial Management and Textile Science.

Chemstrand Fellowship. An award of $2,000 to a student in Chemical Engineering.

Clay Products Service Fellowship. A $1,500 award to a student in Ceramic Engineering.

Coker's Pedigreed Seed Company Award. A $2,400 award to a student in Agricultural Education.

Eastman Kodak Fellowship. An award of $2,000 plus tuition and fees to a student in Chemical Engineering.

Foundation for Cotton Research and Education. A limited number of $2,500 awards, made to students in Agricultural Engineering, with concentration in Ginning Engineering. The recipients are selected by the Foundation (Box 9905, Memphis 12, Tenn.) with approval of the University.

Lead Industries Association Fellowship. A $2,400 award to a student in Ceramic Engineering.

E. C. McArthur Memorial Fellowship. A $2,500 award plus tuition and research materials given by the South Carolina Association of Soil Conservation District Supervisors to a student in Agricultural Engineering.

Monsanto Fellowship. A $1,000 award to a student in the sciences.

National Defense Education Act Fellowships. Three-year fellowships for doctoral study in particular areas are awarded annually by the University on behalf of the Department of Health, Education, and Welfare. Announcement of the availability of these fellowships is made in early October. Inquiries should be addressed to the Graduate School.

National Aeronautics and Space Administration Traineeship Grants. Fellowships for from one to three years' study in space-related fields are awarded annually by the University on behalf of the National Aeronautics and Space Administration. Announcement
of the availability of these fellowships will be made during the fall semester. Inquiries should be addressed to the Graduate School.

National Science Foundation Fellowships and Traineeships. The Graduate School participates in the National Science Foundation cooperative fellowship program, in the summer fellowship program for graduate teaching assistants, and in the traineeship program. Inquiry about these awards should be made early in the academic year and should be directed to the Dean of the Graduate School.

Edward Orton, Jr., Fellowship. A $1,350 award plus supplies, to a student in Ceramic Engineering.

Public Health Service Traineeships and Fellowships. Awards are made by the Public Health Service to students studying in health-related fields. Inquiry about these awards should be directed to the Public Health Service, Bethesda 14, Maryland, or to the Graduate School.

Vanadium Project Fellowship. A $1,200 award plus supplies to a student in Ceramic Engineering.

Wade Stackhouse Loan Fund. Income from a fund donated by Dr. Wade Stackhouse in memory of his father is used to assist graduate students at Clemson and Clemson graduates who are accepted for graduate study.

Warwick Chemical Foundation Fellowships. Income from a fund, donated in memory of Manfred Caranci, available annually for awards to students in Chemistry.

Grants-in-aid to graduate students are sponsored by the Mead Corporation and the Clemson Alumni through the Alumni Loyalty Fund.

All fellowship awards are made by the heads of departments concerned. Information about grants-in-aid is obtainable from the Dean of the Graduate School.

Other Funds. Limited assistance may also be available from the Clemson Foundation, Clemson Student Loan Funds, and National Defense Student Loan Programs. Communicate with the Student Financial Aid Office for further information.
LOAN FUNDS

General prerequisites for the following aid are enrollment, or acceptance for enrollment, as a full-time student, substantiated need, and adequate academic capability or potential to maintain at least average college-level grades. Applicants for other types of financial assistance may also be considered for loans after contacting the Financial Aid Office. Availability is dependent upon adequacy of funds at hand. Normal cutoff date for loan applications is June 1.

Georgianna Camp Foundation Fund. A fund, donated in memory of Georgianna Camp by her husband and sons, is available to assist worthy students who are seeking a college education and need assistance to supplement their individual efforts and available sources of income.

Clemson Architectural Foundation. Needy Architecture students in the upper years of their curriculum who show professional promise will be considered for loans from the General Fund of the Foundation.

Clemson University Foundation. A limited sum is available for emergency student loans. Included are donations from family and friends made in memory of J. C. Littlejohn ('08), J. H. Woodward, Jr. ('35), and his father, Uncle Jake ('02).

Clemson Student Loans. A number of interested faculty and staff members, alumni, students, families, and friends have made memorial donations to assist worthy students. Included are the following funds: Anderson Kiwanis, for juniors and seniors from Anderson County; Beta Tau Sigma, for residents of Horry County; George Cherry, for upperclassmen from Oconee County and the Pendleton area; William Wilson Finley, for students living in counties traversed by the Southern Railway System; Forestry Department, for deserving Forestry upperclassmen; Henry B. Harper, for Agriculture or Industrial Management students; Jerry Allen Harter, for Agriculture students; Richard Hughes Johnson, with family approval; R. F. Poole ('16), by his classmates; S. R. Rhodes, for deserving junior or senior Electrical Engineering students; South Carolina Sheep Producers Association, for students living in South Carolina and majoring in Animal Science or Pre-Veterinary Medicine; Henry Thomas Stroud, for worthy upperclassmen.

Daniel Memorial Fund. Income from a sum donated by officers of the Daniel Corporation in memory of James Fleming Daniel and Fred Adams Daniel is loaned to deserving students.
David Jennings Fund. Income from a fund donated by David Jennings (’02) in memory of his parents and brother is used to aid worthy and deserving students. Preference is given to students majoring in Textiles.

Reid-Baskin Fund. Income from a fund donated in memory of Cecil L. Reid (’02) and John Baskin will be used to aid deserving students. Preference is given Newberry and York County residents.

Tile Council of America Fund. The Tile Council has made a grant to be used for interest-free loans to outstanding and needy students in the lower years of the Architecture curriculum.

National Defense Student Loan Program. State and Federal monies are available to provide assistance to graduate and undergraduate students. Prerequisites are verified need and the demonstrated ability or potential to maintain normal and satisfactory academic progress. Cutoff dates for applications for these loans are: First Semester—June 1; Second Semester—December 1; Summer School (1st session)—April 15; Summer School (2nd session)—May 15.

STUDENT PART-TIME EMPLOYMENT

Clemson University employs students in those positions where part-time services may be utilized to mutual employment advantage. Students in actual need of financial aid are usually given preference in filling positions, all other qualifications being equal. Part-time employment of first-year students is not encouraged as the University has found through long experience that the period of academic adjustment during the freshman year allows little time for such extracurricular activity. The Student Financial Aid Office maintains application files of students desiring part-time employment for the information of requesting academic departments and off-campus agencies and industries interested in securing such help. Applications must be filed after registration for each semester during which part-time work is desired.

OTHER SOURCES OF FINANCIAL AID

The following types of assistance are not administered by Clemson University. Recipients will be required to furnish the supporting agencies with a schedule of payments due the Bursar if payment is desired to be made through the University. Such funds must be received by him on or before the due dates. Any other arrangements require approval of the Bursar.
Other Sources of Financial Aid

National and State Agencies. Students should investigate such sources of financial aid as the following: Veterans Education, War Orphans Education, advanced ROTC programs, income tax exemption, National Guard and Reserve training programs, National Merit Scholarships, American Legion free tuition for deceased or totally disabled veterans' children, and grants made to the handicapped through the State Department of Vocational Rehabilitation.

Other Agencies. Help is often received from grants or loans through Beta, FFA, and 4-H Club membership; local organizations of the Daughters of the American Revolution, United Daughters of the Confederacy, Civitan, Elks, Masonic, Rotary and similar groups; James F. Byrnes Foundation, Pickett and Hatcher Educational Fund, Methodist Student Loan Foundation, Knights Templar Educational Foundation, The Agricultural Society of South Carolina, The Garden Club of South Carolina, Clarendon Soil Conservation District, South Carolina Agricultural Teachers Association, Greenwood Chamber of Commerce; and various other religious, civic, welfare, and educational agencies.

Industry and Related Foundation Support. Students are often able to finance part of their education by summer employment or by alternating semesters between the University and jobs with establishments near their homes. Some students are eligible for loans or grants which are administered by those corporate and local industries which employ their parents. The finest source of information regarding this type of support has been found to be high school counselors.

United Student Aid Funds Loan Program. Clemson University is one of more than 600 colleges and universities participating in this national nonprofit loan program for needy and deserving students. Full-time undergraduate students who have completed satisfactorily the freshman year may borrow up to $1,000 per year and graduate students may borrow as much as $2,000 per year, but no student may borrow more than $4,000. Interest is 6% simple and payments of interest and principle begin the fifth month after graduation and may be anticipated. In case of drop-outs payments are due to begin at once. The financial aid officer recommends the loan, after consultation with the student, and the loan is negotiated at the student's home town bank on the student's own signature.
HONORS AND AWARDS

Recipients for the following awards are chosen for their special achievements by selection committees, and are announced at an annual Honors and Awards Day program in the spring or at other appropriate ceremonies during the year.

Air Force Association Medal. The Air Force Association of Washington, D. C., awards this medal annually to the outstanding senior AS IV cadet who has completed AFROTC summer camp and who has shown outstanding aptitude for both academic and military pursuits.

The Alpha Rho Chi Medal. The Alpha Rho Chi fraternity annually awards a gold medal to the graduate of the professional curriculum in Architecture who has shown the greatest leadership, service to his school, and who gives promise of professional merit.

Alpha Tau Alpha Scholarship Medal. An annual award is given to the senior in Agricultural Education having the highest scholastic record.

Alpha Zeta Award. An annual award is given to an agriculture major having a high scholastic record and possessing qualities of character and leadership.

American Association of Textile Chemists and Colorists Award. An annual award is given for the best work done in Textile Chemistry and Dyeing by a member of the graduating class.

American Association of Textile Technologists Award. An annual award is given to the graduate having a high scholastic record and all-round qualification for success in the textile industry.

American Association of University Women Award. The Clemson branch awards an engraved silver bowl annually to the girl graduating with the highest cumulative grade-point ratio.

American Chemical Society Award. An annual award is given to the outstanding senior in Chemistry who is a member of the student affiliate chapter of the American Chemical Society.

South Carolina Chapter, American Institute of Architects Award. The South Carolina Chapter of the American Institute of Architects each year awards a Certificate of Merit to the outstanding fourth-year student of Architecture in the Design Option and the Structural Option.

American Institute of Architects Medal. The National Organization of The American Institute of Architects awards each year a silver medal and a book to the outstanding graduate in the profes-
Honors and Awards

Honors and Awards in Architecture at Clemson. An award is also presented to the runner-up.

**American Institute of Chemical Engineers Award.** The American Institute of Chemical Engineers sponsors an annual award to the junior majoring in Chemical Engineering who has attained the highest scholastic standing through the sophomore year.

**American Institute of Electrical Engineers – Institute of Radio Engineers Scholastic Award.** An annual award is given to the second semester junior or the first semester senior in Electrical Engineering having the highest scholastic record. Recipient must be a member of the AIEE-IRE Branch.

**American Society of Agronomy Award.** The American Society of Agronomy sponsors an annual award to an outstanding senior in Agronomy.

**American Society of Civil Engineers Membership Award.** The South Carolina Section of the American Society of Civil Engineers sponsors an annual award to the outstanding graduating senior in Civil Engineering.

**The American Society of Mechanical Engineers Award.** An annual award is given to a senior in Mechanical Engineering for his outstanding service in the College of Engineering.

**Society of American Military Engineers Award.** The Society of Military Engineers of Washington, D. C., sponsors an annual award to the most outstanding AFROTC cadet junior majoring in Engineering.

**Society of American Military Engineers Award.** The Society of American Military Engineers awards annually a gold medal with key replica to the twenty outstanding Army ROTC cadet juniors and to the twenty outstanding Army ROTC cadet seniors enrolled in the Army General Military Science ROTC Units in colleges and universities throughout the nation who are majoring in Engineering.

**Architects' Certificates of Merit.** The South Carolina Chapter of the American Institute of Architects each year awards a certificate of merit to the outstanding fourth-year student in the design option and structural option of the professional curriculum in Architecture.

**The Architectural Faculty Award.** The School faculty annually makes an award to the first-year student in Architecture displaying outstanding promise.

**Armed Forces Communication and Electronics Association Gold Medal.** The Armed Forces Communications and Electronics Asso-
Information

The Armed Forces Communication and Electronics Association Gold Medal Honor Award. An annual award is given to the outstanding AFROTC senior majoring in Electrical Engineering who has demonstrated outstanding qualities of military leadership, character, and definite aptitude for military service.

Association of the United States Army ROTC Award. The Association of the United States Army, Washington, D. C., annually awards a medal to the junior ROTC cadet who is in the top 10 per cent in ROTC grades and in the top 25 per cent in general academic grades and who has contributed most, through leadership, to advancing the standing of the Army ROTC unit and the Military Science Department at Clemson University.

Best Drilled AFROTC Cadet. Awarded annually to the AFROTC cadet demonstrating the greatest efficiency in drill procedures. Award is adjudged near the end of each academic year with competition open to all AFROTC cadets.

Best Drilled AFROTC Cadets. Awarded annually to the AFROTC cadets in the junior, sophomore, and freshman classes, adjudged as the best drilled cadet within their respective class.

Best Squadron Commander Award. Awarded annually to the commander of the squadron adjudged as the best drilled squadron of the AFROTC Cadet Wing. Each member of this squadron is then awarded the ribbon, Member of the Best Drilled Squadron.

Block and Bridle Club Scholarship. A $50 award to be paid at the beginning of each regular semester is available to a junior in the Block and Bridle Club. Selection is based on scholastic ability, financial need and leadership in the club and other activities.

Arnold R. Boyd English Honor Key. This key is awarded annually to a student in the graduating class who has made an outstanding record in English as an undergraduate at the University.

Chemical Rubber Company Achievement Award in Chemistry. An annual award is given by the Chemical Rubber Company to the student majoring in Chemistry, Textile Chemistry, or Chemical Engineering who made the highest grade in the first semester course in Chemistry.

The Chemical Rubber Company Achievement Award in Physics. An annual award given by the Chemical Rubber Company to the student making the highest grade in sophomore physics.
Chemistry Faculty Award. An annual award is given to the sophomore majoring in Chemistry who maintained the highest scholastic record in Chemistry during his first two semesters of work.

Chicago Tribune Gold Medal Awards. These awards are given annually to the two senior AFROTC cadets who are most outstanding in military training, academic achievement, and motivation for flying training.

Chicago Tribune Gold Medal Awards. Awarded annually by the Chicago Tribune to the outstanding Army ROTC senior and junior. The awards are based on military achievement, scholastic attainment, and character.

Chicago Tribune Silver Medal Awards. These awards are given annually to the two junior AFROTC cadets who are most outstanding in military training, academic achievement and motivation for flying training.

Chicago Tribune Silver Medal Awards. Awarded annually by the Chicago Tribune to the outstanding Army ROTC sophomore and freshman. The awards are based on military achievement, scholastic attainment, and character.

Class of 1902 Awards. The members of the Class of 1902 have deposited with the Clemson University Foundation three funds of $2,000 each, in recognition of the distinguished teaching services of three professors who were on the faculty at that time, and in memory of those of the class who have passed on. The income from these funds is to be awarded annually as follows: The Williston Wightman Klugh Award, to a worthy, earnest undergraduate student of good moral code and personality who intends to make teaching his life work; The Rudolph Edward Lee Award, to a worthy undergraduate student in Architecture, upon the recommendation of the faculty of that School after consideration of the student’s grades, extracurricular activities, and those qualities that go toward making a successful professional architect; and The Samuel Maner Martin Award, to a worthy undergraduate student taking mathematics as a major subject.

Commander’s Saber. Presented annually by the Professor of Military Science to the Army ROTC cadet officer considered to have contributed most to the advancement of the cadet brigade through leadership and devotion to duty.

Howard Carlisle Copeland Memorial Award. The family of Howard Carlisle Copeland, who gave his life during World War II, has set up a permanent memorial fund in his memory. Each
year the interest from the fund shall be given to the boy who has made the greatest endeavor financially to stay in college.

_Danforth Fellowships._ The Danforth Foundation of St. Louis awards two fellowships each year to agricultural students. One of these is given to an outstanding member of the junior class majoring in either Agricultural Economics, Agricultural Education, Animal Science, Dairy Science or Poultry Science, and provides for a 2-week summer short course with Ralston Purina Company, and a 2-week stay at the American Youth Foundation Leadership Training Camp at Shelby, Michigan. The second award provides for a 2-week stay at the Leadership Camp at Shelby, Michigan, and is awarded to an outstanding freshman in the College of Agriculture and Biological Sciences.

_Distinguished AFROTC Cadet Badge._ An annual award is given by the Department of the Air Force to those individuals, designated by the Professor of Aerospace Studies, who possess outstanding qualities of leadership, high moral character, and definite aptitude for Air Force service. They must have attained an academic standing in the upper 25 per cent of their class and demonstrated leadership ability through their achievements while participating in recognized campus activities. Such recognition carries with it the opportunity for commissioning in the Regular Air Force.

_Distinguished Military Student Badge._ An annual award is given by the Department of the Army to those individuals, designated by the Professor of Military Science, who possess outstanding qualities of leadership, high moral character, and definite aptitude for Army service. They must have attained an academic standing in the upper half of their class and demonstrated leadership ability through their achievements while participating in recognized campus activities. Such recognition carries with it the opportunity for commissioning in the Regular Army.

_Samuel B. Earle Award._ An award established by Clemson Alumni in honor of Dean Samuel B. Earle, who ended 48 years of service to Clemson University in July, 1950, is given annually to an outstanding senior in the College of Engineering.

_Faculty Scholarship Award._ An annual award is given to the member of the graduating class with the highest academic achievement by the academic faculty. This award consists of a certificate and a gold medal.

_Forestry Award._ The income from a fund donated to the Uni-
versity is presented annually to the senior in Forestry with the highest academic record.

**Gamma Sigma Delta Awards.** Awarded annually to the student in the sophomore class and in the senior class majoring in Agriculture and having the highest scholastic attainment.

**Ben H. Gardener Award.** The income from a fund donated to the University by the father and son is given annually to some worthy and needy student in the College of Engineering.

**General Dynamics Award.** An annual award is given to the most outstanding sophomore student of the basic AFROTC course who is qualified and motivated for flying training.

**Industrial Management Faculty Award.** An award is given annually to the member of the graduating class majoring in Industrial Management who has attained the highest academic standing.

**Industrial Management Merit Award.** An award is provided by the Neely and Gibson Coal Sales Company (William J. Neely, '32, and Harry H. Gibson, '32) for an Industrial Management major who has demonstrated through outstanding academic performance and excellent personal characteristics sufficient potential to enable him to assume significant managerial responsibilities in modern industry.

**James Lynah Merit Awards.** Income for several awards is derived from a fund established by Mr. James Lynah, in memory of distinguished professors who were teaching at Clemson when the Class of 1902 were undergraduates, as follows: The Charles Manning Furman Prize in English, The Mark Bernard Hardin Prize in Chemistry, The William Shannon Morrison Prize in History, The Charles Carter Newman Prize in Horticulture, The Walter Merritt Riggs Prize in Electrical Engineering and The Augustus G. Shanklin Prize in ROTC, Air or Military Science and Tactics. These awards are made to students having a high scholastic rating and possessing outstanding qualities of character and leadership.

**Clark Lindsay McCaslan Award.** A sum of money has been deposited with the University to establish a fund in memory of Clark Lindsay McCaslan, Class of 1908, and a pioneer in Agricultural Engineering. The income from the fund shall be given annually to the student in the Department of Agricultural Engineering who in the opinion of the faculty shall be deemed to be the most deserving.

**Henry T. Malone Gamma Alpha Mu Award.** Henry T. Malone, Class of 1937, will present a $50 award to the undergraduate stu-
dent who writes the best feature on campus, community, or state history to appear in *The Tiger*.

**Marksmanship Award.** Awarded annually to the AFROTC cadet achieving the highest scores among the AFROTC cadets of the University Rifle Team.

**Marksmanship Awards.** Medals are annually presented to those members of the Army ROTC Rifle Team achieving highest position average scores.

**Dr. Ralph Mershon Memorial Award.** The Secretary of the Army will present annually a $250 prize to the outstanding Distinguished Military Graduate of a senior division Army ROTC university or college who is commissioned in the Regular Army.

**The Minaret Award.** The Minaret Society each year presents a Certificate to the outstanding second year student in the professional curriculum in Architecture. Scholarship, leadership and qualities of character will be considered.

**Northern Textile Association Medal.** Awarded annually to the outstanding graduate in Textiles.

**National Defense Transportation Association Award.** The National Defense Transportation Association will award annually the NDTA Medal to the twenty outstanding senior students enrolled in General Military Science Army ROTC units throughout the nation.

**Thomas Newcomen Award in Material History.** The Newcomen Society in North America gives an annual award for the best research paper presented in the field of Material History.

**Norris Medal.** The following is from the will of the Hon. D. K. Norris, a life trustee of Clemson, who died in 1905:

"I give $500.00 face value, Norris Cotton Mill stock... on condition the dividend thereon shall be applied annually to the purchase of a gold medal, to be known as the 'Norris Medal', to be awarded to the student of Clemson meriting the same at graduation, under such rules and conditions as may be prescribed by the said Board of Trustees, and which medal shall have engraved on it 'Honor habet onus' (Honor brings responsibility)."

**American Ordnance Association Gold Scholarship Key.** The American Ordnance Association, Washington, D. C., sponsors annually an award to the senior Army ROTC cadet with the most ability in the ordnance field to be commissioned to the Ordnance Corps.
Willie N. and Joe Wise Paget Scholarship. The income from a fund donated to the University by members of their family is used annually to aid a deserving student from Saluda County.

Phi Eta Sigma Mathematics Award. An annual award is given to a freshman scoring highest on a competitive examination in mathematics.

Phi Eta Sigma Scholarship Medal. An annual award is given to the senior having the highest scholastic record.

Phi Kappa Phi Award. An annual award is given to the junior having the highest scholastic record.

Phi Psi Award. This award is made annually by the National Honor Council of the Phi Psi Textile Fraternity to the outstanding textile graduate, considering scholastic record, leadership ability, and other qualities.

Quartermaster Association Awards. The Quartermaster Association annually awards a medal to the ten outstanding junior students and a scholastic key to the ten outstanding senior students enrolled in the Army General Military Science ROTC program in colleges and universities throughout the nation. Students must be enrolled in courses including as a major item of curriculum at least one educational area of particular interest to the Quartermaster Corps.

Reserve Officers Association Award. Awarded annually to an AFROTC junior and senior cadet, based on scholastic and Aerospace Studies grades, and leadership qualities.

Reserve Officers Association Medal. The South Carolina Department of the Reserve Officers Association sponsors an annual award to the outstanding senior Army ROTC Cadet.

Sigma Pi Sigma Prize. An annual award is given to the outstanding senior in the Physics Department.

Sigma Tau Epsilon Award. An annual award is given to the senior majoring in the College of Arts and Sciences and having the highest scholastic record.

R. W. Simpson Medal. A medal designated as the “R. W. Simpson Medal” is awarded annually to the best drilled cadet in the freshman, sophomore, or junior class.

The Solite Award. The Southern Lightweight Aggregate Company annually makes a grant of $1,000 to the Clemson Architectural Foundation, a portion of which is used for prizes for those fifth-year professional theses adjudged to be outstanding.
Sons of the American Revolution Award. An annual award is given to a freshman AFROTC cadet who is outstanding in academic courses, Aerospace Studies, and leadership characteristics.

The South Carolina Masonry Association Award. The South Carolina Masonry Association annually makes a grant of $600 to the Clemson Architectural Foundation, a portion of which is used for awards in an intermediate-level architectural design problem.

South Carolina Society of Sons of American Revolution Medal. An annual award is given to an Army ROTC cadet who exhibits a high degree of merit with respect to leadership, soldierly bearing and excellence in theoretical courses of study.

The Southern Brick and Tile Award. The Southern Brick and Tile Association annually makes a grant of $100 for prizes awarded in an advanced-level architectural design problem.

Algernon Sydney Sullivan Medallion. A valuable and artistic memorial, established by the Southern Society of New York in honor of its first president, is awarded each year by the University to a member of the graduating class and to one other person who has some interest in, association with, or relation to the institution, official or otherwise, of a nature as to make this form of recognition appropriate. The recipients of this award shall be chosen in recognition of their influence for good, their excellence in maintaining high ideals of living, their spiritual qualities, and their generous and disinterested service to others.

Superior Cadet Ribbon Awards. The Department of the Army awards annually Superior Cadet Ribbons to those Army ROTC students in each academic year (class) adjudged the most outstanding in their class.

Third Army Certificate of Meritorious Leadership Achievement. An award is given annually by the Commanding General of Third Army to the outstanding cadet on the basis of leadership development throughout the ROTC career.

Tau Beta Pi Scholastic Award. An annual award is given to the sophomore in Engineering having the highest scholastic record.

Trustees' Medal. The Board of Trustees has provided for a gold medal to be awarded annually to the best speaker in the student body.

Virginia Dare Award. An award of $25 is given annually by the Virginia Dare Extract Company, Incorporated, to the senior major-
Guidance has an important role at all levels of education and particularly so during times of transition and articulation. To assist students in this period of emotional and academic adjustment, an orientation and counseling program has been established.

At the beginning of his university career, each student is assigned to a faculty adviser selected from his academic school. The faculty advisers provide information on courses of study, approve class schedules, interpret academic regulations, and suggest adjustments in making satisfactory progress toward graduation.

The residence hall program is organized to cope with personal problems and questions regarding procedures and policies of college life. Residence hall counselors and supervisors are primarily concerned with maintaining an environment compatible to serious study and with the educational potential of group living.

Counseling Services are located in Tillman Hall. These services are available free of charge to all registered students and wives of registered students. These services are oriented to early identification of and assistance with academic, vocational, personal, and psychological problems. Testing facilities of a vocational and psychological nature are available. Students are encouraged to take advantage of the individual services of a Counseling Psychologist and a Counselor, and of the Psychometric Services.

Although the University is glad to assist all who ask for help in securing summer or permanent employment, there is no obligation to secure positions for those who complete any of the courses of study.
The Placement Office coordinates and plans campus interview visits requested by representatives seeking graduates for positions with business, industry, and government. It maintains current files of reported job opportunities and of alumni who wish to learn of available openings.

A Placement Bulletin is prepared periodically for distribution on the campus and mailing to alumni upon request, to announce scheduled campus interviews, and to list specific openings which may be of interest to students and alumni.

BUILDINGS AND GROUNDS

Today, as throughout Clemson’s history, the centerpiece of this picturesque campus is the Tillman Hall clock tower, the symbol of scientific education, research and public service in South Carolina. Honoring the memory of colorful Governor "Pitchfork Ben" Tillman, this building houses administrative offices on the two lower floors and classrooms upstairs.

The Clemson campus proper consists of 600 acres and represents an investment approximating 40 million dollars in academic buildings, student housing and service facilities. Basically, this is the plantation that Thomas Green Clemson willed to South Carolina for the establishment of the University. Fort Hill, the former home of both Mr. Clemson and his illustrious father-in-law, John C. Calhoun, is preserved in the center of the campus as a national shrine.

Beyond the main campus, stretching into Oconee, Pickens, and Anderson Counties, are another 23,000 acres of farm and agricultural and engineering research lands. Over the State are 4,000 more acres devoted to Agricultural Experiment Station research and 4-H Club work.

Teaching and laboratory facilities of the College of Agriculture and Biological Sciences are housed in the several buildings of the Agricultural Complex. Another grouping serves the College of Engineering. Among these are Olin Hall for Ceramic Engineering and Earle Hall for Chemical Engineering. These two buildings and the excellent equipment they house represent gifts from the Olin Foundation totaling nearly two million dollars.

Sirrine Hall is the home of the School of Industrial Management and Textile Science and within it are located government and industrial cotton fiber testing laboratories. The School of Archi-
Reserve Officers' Training Corps (ROTC)

Architecture is located in a modern, well-equipped building recently completed and a third grouping of classrooms and laboratories serves the College of Arts and Sciences.

The nine dormitories for men will accommodate 3,322; one uniquely designed structure houses 2,200. The women's dormitories will accommodate 288. Individual units or apartments accommodate 400 married students.

Student welfare facilities for the more than 5,000 young men and women on the campus include the Library, Infirmary, YMCA, Laundry, Dining Room, Field House, Stadium, and service center for water, light and heat.

The university-owned Clemson House and adjacent Clemson Homes provide excellent community hotel accommodation and permanent housing for staff members.

RESERVE OFFICERS' TRAINING CORPS (ROTC)

The Department of the Air Force and the Department of the Army both maintain Senior Division units of the ROTC at Clemson.

The mission of the Reserve Officers' Training Corps is to produce junior officers having qualities of leadership and attributes essential to their progress and continued development as commissioned officers in either the Air Force or the Army of the United States.

To implement this mission, a four-year program is offered consisting of the basic course for freshmen and sophomores and the advanced course for juniors and seniors.

The basic course, consisting of the first two years of Aerospace Studies or Military Science, is a requirement in every undergraduate curriculum of the University and as such must be taken the same as other required freshman and sophomore courses and completed for graduation. Entering students are permitted to enroll in the service of their choice.

Entrance requirements for the basic ROTC programs are as follows:

Students must be at least 14 years of age, citizens of the United States at the time of entrance; of good moral character; must sign a loyalty certificate; and not be physically disqualified to the extent that drill would further aggravate the physical defect. Furthermore, Air Force candidates will be administered a written Air Force Officer Qualification Test and must pass a physical examination the early part of their freshman year. Foreign students may enroll in the ROTC program provided they sign a statement of intention to
become American citizens or receive the approval of their governments.

Since a maximum quota is placed on entrance into the advanced ROTC program, it is difficult for a student to transfer from one basic course of a program into the advanced course of another program. Hence, students who feel they may not qualify for commission in one program are encouraged to enroll in the program in which they plan ultimately to receive their commission.

The following students are exempt from the requirement of the basic ROTC course but must complete for graduation the equivalent credit hours of approved electives:

a. Students not physically and scholastically qualified for basic ROTC.

b. Students who have attained age of 21 at time of entrance.

c. Transfer students entering with 30 or more semester credit hours acceptable toward graduation at Clemson in their respective curriculums.

d. Students who are married at time of entrance.

e. Women students.

f. Students who are not citizens of the United States.

Students who have had at least six months of active military service are exempt from the basic ROTC course. However, veteran students who intend to apply for advanced ROTC should consult with the Head of the Military Science or Aerospace Studies Department with reference to placement credit for previous service.

Physically qualified students who are exempt from the basic course for other reasons may elect to take the freshman and sophomore courses in Aerospace Studies or Military Science upon approval of the Head of the Aerospace Studies or Military Science Department concerned.

Students who complete the prescribed ROTC courses and receive a bachelor’s degree may be awarded commissions in either the Air Force or Army Reserve. Each student receives 1 credit hour for each semester of the basic course and 3 credit hours for each semester of advanced ROTC successfully completed. Only 6 credit hours for advanced ROTC will be applicable toward a degree.

Members of the advanced course are required to attend one summer camp before commissioning. Data on pay and length of camp are detailed in the specific sections following for Aerospace Studies and Military Science. The Air Force encampment is normally of
4 weeks duration and the Army encampment is normally of 6 weeks duration.

Currently, uniforms are provided basic ROTC students. A deposit of $25 is required from each student. This is refundable when the uniform is turned in, provided there is no damage to the uniform other than normal wear.

Each advanced ROTC student is credited with $100, paid to the University, which is used by the University to purchase officer-type uniforms for use during the junior and senior years. The uniform becomes the property of the student when he receives a commission.

**AIR FORCE ROTC**

The Air Force Officer Education program is designed to provide for selected college students in designated civilian educational institutions an education that will develop skills and attitudes vital to the career, professional Air Force officer. Also it is designed to qualify for commissions, those male college students who desire to serve in the United States Air Force.

The purpose and specific objectives of the program are:

1. To select and motivate high quality young men toward a career in the United States Air Force in fields specifically required.
2. To develop in cadets by example and participation the attributes of character, personality and attitudes required of a leader.
3. To develop in cadets a familiarity with and understanding of the Air Force mission, organization, operations, problems, and its employment in the global concept.
4. To provide that military education and training necessary to complement and supplement the civilian education resulting in the obtaining by the cadet of a sound foundation on which to build an officer career.

The Air Force Officer Education Program at Clemson University is authorized under the Reserve Officer's Training Corps Revitalization Act of 1964 as promulgated by the 88th Congress and an agreement entered into by the University and the Department of the Air Force.\(^*\)

\(^*\) Information contained in this section is subject to change inasmuch as the implementation instructions concerning the provisions of the ROTC Vitalization Act of 1964 have not at the time of this writing been received from the Department of Defense. For current information regarding this program, you are encouraged to visit, write, or telephone the Professor of Aerospace Studies, Clemson University.
The program consists of the basic and advanced courses. Both courses are generalized in nature and are designed to give the student a broad picture of the Air Force organization and mission and to stimulate a growing desire on the part of the student to enter the Air Force. The basic course consists of 2 years with 60 hours of classroom instruction and 30 hours leadership laboratory (drill) each year.

During the second year of the basic course a cadet may apply for admission into the two-year advanced course. The advanced course consists of 120 hours of instruction each year, 90 hours classroom instruction and 30 hours leadership laboratory. If accepted into the advanced AFROTC course, the cadet will be placed under contract and after satisfactory completion, he will be commissioned a Second Lieutenant, United States Air Force Reserve. He will be called to active duty for a period of 5 years as a pilot or navigator; 4 years as a nonflying officer; or 3 years provided he has had previous satisfactory active duty service.

Cadets of this detachment are permitted to make orientation flights in USAF aircraft. These flights are usually in the local area, but field trips to other Air Force bases are accomplished from time to time. This enables cadets to see bases from all aspects of daily operation.

To become eligible for the advanced program a cadet must: (1) Make application; (2) Pass the Air Force Officer’s Qualification Test; (3) Pass the Air Force Physical Examination; (4) Possess leadership ability and good moral character; (5) Be classified as an academic junior and possess a minimum cumulative grade-point ratio of 1.90.

Cadets accepted for the advanced program are identified in one of five specific categories:

*Category IP—Pilot Training:* To be eligible for this category an advanced cadet must meet the required physical standards, measured aptitude and interest qualifications. Category IP cadets will participate in the Flight Instruction Program (FIP) during their senior year. They will receive 36½ hours pilot training conducted by a civilian contract flying school and if all requirements are met, will be awarded a Private Pilot’s license upon completion.

*Category IN—Navigator Training:* To be eligible for this category and advanced cadet must meet the required physical standards, measured aptitude and interest qualifications.

*Category II—(Nonflying) Technical Fields:* This category consists of cadets enrolled in college programs leading to baccalaureate
degrees, with majors in prescribed engineering and scientific fields of study, who meet physical standards for an Air Force commission and are selected for the advanced course. Cadets commissioned in this category are obligated for four years' active duty.

Category III—(Nonflying) Nontechnical Fields: This category consists of cadets enrolled in college programs leading to a baccalaureate degree, with majors in other than engineering and scientific fields of study and are identified as possessing outstanding officer potential, and are above average academically. Cadets commissioned in this category are obligated for four years' active duty.

Category IV—Prior Service: This category consists of service exempt cadets who have served on active duty for training and have satisfied the requirements of Selective Service, have been awarded a degree, and have been individually approved by higher headquarters. Cadets commissioned in this category are obligated for three years' active duty.

The Air Force provides three outstanding programs whereby an AFROTC graduate may pursue studies leading to graduate degrees. The Educational Delay program allows an AFROTC graduate to have his call to active duty delayed until after he receives his advanced degree. "Operation Bootstrap" is a program which permits an officer on active duty to be assigned to a college or university of his choice for graduate work provided degree requirements can be met within 12 months or less. Officers receive full pay and allowances while attending college under "Operation Bootstrap." The largest and most comprehensive programs for providing advanced formal education is through the Air Force Institute of Technology (AFIT) which has the mission of providing education and training to meet technological, scientific, and other professional requirements of the Air Force. To accomplish the mission, AFIT offers programs at the undergraduate and graduate level in its fully accredited Resident Schools of Engineering, Logistics, and Civil Engineering at Wright-Patterson AFB, Ohio; at selected civilian colleges and universities, and through its Training-with-Industry program. All Air Force officers in the grade of Lieutenant Colonel or below are eligible to apply for AFIT training. All undergraduate grades of "C" (2.0) or above are creditable towards evaluation for entrance into the graduate programs. Each individual applicant will be evaluated for eligibility based on his individual record as it applies to the current programs and needs of the Air Force.

Officers selected for training in civilian institutions are assigned to AFIT with duty station at the university or industry concerned.
Tuition charges and fees are assumed by the Air Force, and each student receives an annual monetary allowance to help defray the costs of supplies and theses. He also receives his full military pay and allowances. Rated (flying) officers are attached to the nearest Air Force base for accomplishment of flying proficiency.

An important part of the AFIT mission is to offer counseling and guidance to officers who do not presently meet academic prerequisites so that they may become qualified for participation.

Cadets enrolled in the advanced course will attend a four-week training period at an Air Force base between their junior and senior years. This period is designed to give them an idea of how a typical air base functions, and to provide them with an opportunity to fly in USAF aircraft. In addition to several hours of orientation flying, they will visit and train on the job in such base activities as headquarters sections, maintenance shops, base operations, and others. Summer training curriculum is designed to provide training and actual experience which will prepare them to assume cadet officer positions in their senior year.

Quarters, meals, uniforms, and medical care will be provided. Cadets are provided rail or bus transportation to and from the air base. If cadets drive their car, they are paid mileage at the rate of $0.06 per mile from their official residence to the base and return. In addition, they will receive $78 for the 4-week training period.

Those cadets who have demonstrated outstanding leadership and academic qualities may be designated as Distinguished AFROTC Cadets at the beginning of the senior year. These designations are made upon recommendation by a board of Air Force officers and the University Director of Admissions and Registration and are concurred in by the President of the University and Head of the Aerospace Studies Department.

Those cadets officially designated as Distinguished AFROTC Cadets may apply for a Regular Air Force Commission up to 60 days prior to commissioning. The cadet is competing with all other Distinguished AFROTC Cadets, nationwide, for a Regular Air Force commission. If selected for appointment in the Regular Air Force, Distinguished AFROTC Cadets must be designated as a Distinguished AFROTC Graduate upon graduation. Those Distinguished Cadets who continue to maintain outstanding progress in the senior year are designated as Distinguished graduates.
ARMY ROTC

The Army ROTC instruction stresses an academic college-level program in content, scope, and intensity. Emphasis is placed on the development of the student's leadership, bearing, discipline, judgment and sportsmanship which will be a distinct asset in any profession that he may choose, military or civilian.

The Army Reserve Officer Training Program at Clemson University is authorized under the ROTC Vitalization Act of 1964 as promulgated by the 88th Congress and an agreement entered into by the University and the Department of the Army. Information contained in this section is subject to change inasmuch as instructions for implementation of the ROTC Vitalization Act of 1964 are not complete at this writing. For current information you are encouraged to contact the Professor of Military Science, Clemson University.

The General Military Science Program is conducted at Clemson (see Part V of this catalog for a description of courses). The program consists of a Basic Course for freshmen and sophomores and the Advanced Program for those participating juniors and seniors. A student who has successfully completed the basic course, who meets the physical requirements, who has earned sufficient academic credits to be designated as an academic junior, and who is recommended by his instructors, may enter the Advanced Course offered during the junior and senior years. Successful completion of the Advanced Program qualifies the student for a regular or reserve commission in any of the arms or services of the United States Army.

The requirements for formal enrollment in the Advanced ROTC Program are as follows:

Junior Year. Must have successfully completed all previous Military Science courses, have acquired a passing grade on a general intelligence test which is administered during the sophomore year, be physically qualified, and must have acquired the minimum grade-point ratio required for designation as an academic junior. The number of credits required for participation in the Advanced Course complements the academic requirements of the school and insures that the cadet receives his commission and his diploma simultaneously.

Senior Year. Must have successfully completed all previous Military Science courses and have attended summer camp, must be an academic senior, and have the cumulative grade-point ratio required for graduation.
Exceptions, where warranted, to the above general rules may be made by the Head of the Military Science Department.

During the fourth year of general military instruction, students will have the opportunity to indicate their preference for assignment to a particular branch. Final assignment authority remains with the Department of the Army and will be dependent upon such factors as the student's major academic course, class standing, qualities of leadership, the requirements and existing vacancies in the various branches of the Army, in addition to the student's choice.

Outstanding Army ROTC cadets who attain grades in the upper half of the class in academic subjects and the upper third in Military Science subjects during their junior year and who possess outstanding qualities of leadership, character and aptitude for military service may, with the approval of the University President, be designated as Distinguished Military Students by the Head of the Military Science Department. Those who maintain this outstanding record during their senior year may be designated Distinguished Military Graduates. A Distinguished Military Student may apply for appointment as a Second Lieutenant in the Regular Army.

An Army ROTC student in his senior year may enroll in the Army ROTC Flight Training Program. If accepted, the student will receive 35 hours of ground school and 35 hours of flight training at Government expense after which the student may qualify for his FAA license. To be accepted in the Flight Training Program the candidate must agree to serve on active duty for three years in addition to meeting other physical and mental requirements.

ROTC students receiving commissions in the Army Reserve or Regular Army have the opportunity to attend graduate school under the following conditions:

a. Students commissioned in the Army Reserve may receive a delay for call to active duty to attend graduate school at their expense. They must, however, complete their active duty obligation prior to the sixth anniversary of being commissioned. A student being deferred is also satisfying his reserve obligation and has established an early date of rank for promotion, longevity and retirement purposes.

b. A student receiving a commission in the Regular Army may apply for excess leave to attend graduate school at his expense. While on an excess-leave status, the officer will receive promotions with his contemporaries, establish an early date of rank for longevity and pay purposes and may utilize all the facilities authorized an officer on active duty.
The student who receives his commission through Army ROTC is appointed in the Army Reserves as a Second Lieutenant and called to active duty for 2 years or to active duty for training for 6 months. During his senior year the student may indicate his preference for either period; the final decision is based on the student’s desire and the needs of the service. A period of active duty for training requires that the student retain his reserve commission and remain in the Ready Reserve until the eighth anniversary of the receipt of his commission. Graduates of the program who enter active duty for 2 years will acquire a 6-year military obligation, only 3 of which would be in the Ready Reserve.

A recapitulation of service obligation is listed below:

<table>
<thead>
<tr>
<th>Reserve Officers</th>
<th>Regular Army and Flight Training Officers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Duty ...... 2 Years</td>
<td>6 Months</td>
</tr>
<tr>
<td>Ready Reserve ...... 3 Years</td>
<td>7½ Years</td>
</tr>
<tr>
<td>Standby Reserve ...... 1 Year</td>
<td>1 Year</td>
</tr>
</tbody>
</table>

**RELIGIOUS LIFE**

Religious life at Clemson University is coordinated by the University YMCA with the General Secretary of the YMCA serving as coordinator.

Religious work with students is on a voluntary basis so that students who are participating either in the YMCA’s program or that of one of the local churches do so on a voluntary basis.

The YMCA building provides a meeting place for denominational groups not having a church at Clemson, as well as for many inter-denominational groups. There are six active churches—Baptist, Methodist, Presbyterian, Lutheran, Episcopal, Roman Catholic. Each of these churches has a program especially designed for college students, and five of the churches have full-time student workers in addition to the minister of the church. The minister of the Lutheran Church serves both as pastor and minister to students. The program of the YMCA is under the direction of a staff of three men.

The Student Center, which is located in the dormitory, has a chapel which is used by all of the religious groups as scheduled. This chapel is used for private meditations and for certain scheduled religious services with student groups.
HISTORICAL STATEMENT

In 1889 the General Assembly of South Carolina accepted the bequest of Thomas G. Clemson, which set aside the bulk of the Clemson estate for the founding of a scientific and technical college. The institution was also established under the Morrill Land-Grant Act passed by the National Congress in 1862. Clemson University, therefore, is a member of the national system of Land-Grant Colleges and Universities.

In 1964, in recognition of the expanded offerings of the institution not only in the areas of agricultural and mechanical arts but also in the sciences and arts, the name of the institution was changed to Clemson University. This change by the Legislature, effective July 1, 1964, followed an earlier recommendation to that body by the Board of Trustees.

The nature of the institution is outlined in Mr. Clemson’s will and its acceptance by the legislature.

The will in part reads:

Feeling a great sympathy for the farmers of this State, and the difficulties with which they have to contend in their efforts to establish the business of agriculture upon a proper basis, and believing that there can be no permanent improvement in agriculture without a knowledge of those sciences which pertain particularly thereto, I have determined to devote the bulk of my property to the establishment of an Agricultural College upon the Fort Hill Place. My purpose is to establish an Agricultural College which will afford useful information to the farmers and mechanics; therefore it should afford thorough instruction in agriculture and the natural sciences connected therewith; it should combine, if practicable, physical with intellectual education; and should be a high seminary of learning in which the graduate of the common schools can commence, pursue and finish a course of studies terminating in thorough theoretic and practical instruction in those sciences and arts which bear directly upon agriculture . . . but to always bear in mind that the benefits herein sought to be bestowed are intended to benefit agriculture and mechanical industries . . . I trust I do not exaggerate the importance of such an institution for developing the material resources of the State, by affording its youth the advantages of scientific culture.

The desire to establish such a school or college, as I have provided for in my said last will and testament, has existed with me for many years past, and many years ago I determined to devote the bulk of my property to the establishment of an Agricultural School or College. To accomplish this purpose is now the one great desire of my life.

This will gave all that part of the Fort Hill Estate inherited by Mrs. Clemson from her mother and the bulk of Mr. Clemson's other real and personal property. The latter amounted to a sum, which, considering the purchasing power at the time, probably has been only a few times exceeded in a public benefaction in South Carolina.
A Board of Trustees of seven members was provided for: R. W. Simpson, D. K. Norris, M. L. Donaldson, R. E. Bowen, B. R. Tillman, J. E. Wannamaker, and J. E. Bradley, who with those chosen by the General Assembly, should constitute a governing board in the event the State accepted the bequest; but, who, in the event the State declined the bequest, should alone constitute a governing board for a private institution.

These seven trustees, along with other friends of the movement and the agricultural groups in the State, developed and organized a public opinion favorable to the plan.

In November, 1889, the General Assembly of South Carolina accepted the terms of the will and, following the decision of the United States Supreme Court to uphold the will, the State of South Carolina and the full Board of Trustees proceeded to convert the dream of Thomas G. Clemson into the reality of Clemson College.

The College was formally opened in July, 1893, with an enrollment of 446 students. The first graduating exercises were held in December, 1896, with a graduating class numbering 37—15 in the agricultural courses and 22 in the engineering courses.

LOCATION

The University is located on the Fort Hill homestead of John C. Calhoun, in the foothills of the Blue Ridge Mountains. It has an elevation of 800 feet above sea level and commands an excellent view of the mountains to the north and west, some of which attain an altitude of over 5,000 feet.

The University is located at Clemson, S. C., on the main line of the Southern Railway. U. S. Highways numbers 76 and 123 pass through Clemson, and daily bus service at regular intervals is available.

ALUMNI RELATIONS

The office of alumni relations coordinates all functions and services of the alumni office. The director of alumni relations is secretary of the Clemson Alumni Association and the Clemson Foundation through election by the governing boards of these two organizations.

Accurate records of addresses and information concerning alumni are being compiled by this office which also publishes a magazine and newsletter for distribution to the alumni.

The purpose of the Alumni Association is to serve the University and its alumni in every possible way. The Association holds its
regular annual meeting at the University each June. Active membership is made up of former Clemson students who participate in the Clemson Alumni Loyalty Fund for the purpose of providing supplementary financial aid to the educational programs of the University.

The Clemson University Foundation was founded by interested members of the Alumni Association to raise an endowment to be used for the benefit of the University, its students, faculty and alumni. Trustees of the Foundation are elected by the Association.

**THE J. E. SIRRINE TEXTILE FOUNDATION**

Funds in this foundation were contributed by the members of the textile industry in South Carolina and amount to about one million dollars. Income from this fund is administered by the trustees of the J. E. Sirrine Textile Foundation. They have used the income to benefit textile teaching and research at Clemson University. Under the present system it is used to (1) supplement university travel funds for faculty members, (2) pay half the salary of staff members in research, (3) sponsor the school library by paying the salary of the librarian and paying for periodicals and books, (4) provide supplement to the salaries for two major professors.
STUDENT LIFE AND ACTIVITIES

Part III
PART III—Student Life and Activities

STUDENT BODY

Clemson has a predominantly male student body, a fact that is slowly changing as each year a slight increase in the co-ed population takes place. The student body is basically a resident one with approximately 70 per cent of the students living in dormitories. Married students, and commuting students comprise the majority of non-dormitory residents. Forty-two states and twenty-two foreign countries are represented in the student body.

STUDENT GOVERNMENT

Student Government is actively sponsored and highly effective at Clemson. The three branches of government are patterned after our federal system; however, there are no political parties within the framework of this student organization. March and April are election months for student body and class offices except for the freshman class which holds class officer and Student Senate elections in October. Students interested in self-government are encouraged to participate in this highly desirable activity.

CLUBS AND SOCIETIES

Honor Fraternities. Honorary professional organizations, including Tau Beta Pi, Sigma Tau Epsilon, Phi Psi, Alpha Zeta, Alpha Tau Alpha, Iota Lambda Sigma, and Sigma Pi Sigma give recognition to superior work done by Engineering, Arts and Sciences, Textile, Agricultural, Agricultural Education, Industrial Education, and Physics students, respectively.

The Phi Kappa Phi honor society and the Phi Eta Sigma fraternity both have chapters at Clemson. The former is an all-college honor organization composed of seniors and second-semester juniors. The latter is a freshman organization with members selected from students who attain a high scholastic standing during the first semester of their freshman year.

College of Agriculture and Biological Sciences. Outstanding students majoring in the College of Agriculture and Biological Sciences are eligible for membership in societies as follows:

American Dairy Science Association—Students in Dairy Science
American Farm Economic Association—Students in Agricultural Economics
American Society of Agronomy—Students in Agronomy
American Society of Animal Science—Students in Animal Science
American Society for Horticultural Science—Students in Horticulture
Society of American Foresters—Students in Forestry

School of Architecture. Professional students in architecture are selected for membership in the Student Chapter of the American Institute of Architects. Students in the Building Construction curriculum are eligible for membership in the Student Chapter of the Associated General Contractors.

Engineering Societies. Outstanding students majoring in engineering courses are selected for membership in the Student Chapter of the American Institute of Electrical Engineers-Institute of Radio Engineers, American Society of Mechanical Engineers, American Society of Civil Engineers, American Institute of Chemical Engineers, American Ceramic Society, American Society of Industrial Engineers, American Society of Agricultural Engineers, and the Society of American Military Engineers.

Societies in the School of Industrial Management and Textile Science. Students majoring in this school have several societies that they may join. There are three student chapters of national societies which are open to students of the School.

1. The American Association for Textile Technology is open to students in the Textile curriculum.
2. The American Association of Textile Chemists and Colorists is open to students in the Textile Chemistry curriculum.
3. The Society for the Advancement of Management is open to students in Industrial Management, Textiles, and Textile Chemistry.

In addition to these student chapters of national societies, the Industrial Management Society is a local club for students in Industrial Management.

Music Activities. There are two choral organizations active on the Clemson campus for students interested in formal singing activities. The Clemson Glee Club consists of fifty members and is open to men students. For women students there is a mixed choral ensemble. Throughout the school year these groups perform on the campus for many student-wide events, including full-length concerts. In the spring a tour of the state and nearby states is made. Audition is required for membership.
The University also has the Tiger Marching Band, concert bands and ROTC band, and they are explained in more detail in another part of this section. Mu Beta Psi is the recognized fraternity composed of members of all musical organizations.

**Student Clubs.** Students majoring in various courses of instruction have organized clubs. Among such clubs are the Block and Bridle Club (Animal Science), Agricultural Economics Club, Biological Sciences Club (Biology and Entomology), Student Chapter of American Dairy Science Association, Forestry Club, Collegiate F.F.A., Collegiate Branch American Society for Horticultural Science, Kappa Alpha Sigma (Agronomy), Newtonian Society (Mathematics), Poultry Science Club, Geology Club, and the Pre-Veterinary Club.

The Blue Key, a national fraternity based upon leadership, has a chapter at Clemson, as does Alpha Phi Omega, a national fraternity of former Boy Scouts. The Tiger Brotherhood is a local organization at Clemson which stresses the qualities of leadership. Circle K International is a student service organization sponsored by Kiwanis International, and the DeMolay Club also has a chapter at Clemson.

The University also recognizes certain regional clubs, such as the Bamberg County-Clemson Club, Beta Sigma Chi (Charleston), and the Central Savannah River Area-Clemson Club. An International Student Organization attracts most of the foreign students to its meetings and projects.

The YMCA and the Clemson churches are recognized through the YMCA Cabinet and the Class Councils and organizations, such as the Baptist Student Union, Hillel-Brandeis Club, Canterbury Club, Christian Science Organization, Lutheran Student Association, Newman Club, Presbyterian Student Association and Wesley Foundation.

**Military Activities and Clubs.** The military activities of students are recognized through Scabbard and Blade, a national military honor fraternity, and the Pershing Rifles, a national honorary military organization. Air Force students are further recognized through the Arnold Air Society, a national Air Force honorary society. Members of this honorary society receive numerous opportunities to gain insight and working knowledge of the United States Air Force through base visitations, orientation flights, and National Society Conclaves. An auxiliary drill unit, The Angel Flight is available for interested women students. Semper Fidelis is the organization on campus that represents the Marine interest. Exhibitions of fancy drill are presented by the Pershing Rifles at football games,
Clubs and Societies

Parades and other celebrations and ceremonies. On two occasions within the last seven years, the Pershing Rifles were adjudged National Drill Champions in competition with colleges and universities throughout the country at the annual Cherry Blossom Festival, Washington, D.C. Freshmen may be selected for membership in the Freshman Platoon.

The Clemson Rifle Team, a part of the Rifle Club, has operated successfully for a number of years. Last year the Rifle Team won the championship of the Atlantic Coast Conference. An indoor range is provided for practice and matches. A girls’ rifle team was organized and trained during the last year.

The Pershing Rifles also have their own rifle team. The Counter-guerrilla Unit has been formed by the Army ROTC for cadets who are interested in advanced military training.

Athletic. The Block “C” Club includes students who have earned letters in major sports.

Publications. Publications at Clemson are handled by clubs and organizations which carry specific responsibility for such publications. The Blue Key Directory is published by the Blue Key fraternity, the Agrarian, by the agriculture clubs, the Bobbin and Beaker, a magazine for alumni and the textile industry, is published by the students of the School of Industrial Management and Textile Science under faculty direction; YMCA Handbook, under the direction of the YMCA Cabinet. The Tiger, newspaper, and The Taps, annual, are published by staffs that carry responsibilities for those publications, and the Chronicle, the humor magazine, has a staff made up of interested and talented students. The Arnold Air Lines is published by the Arnold Air Society.

Radio. Radio Station WSBF, a 10-watt FM and AM closed-circuit operation, is managed entirely by a student staff. It offers training for announcers, program organization, script writing and engineering.

Social. Eight local social fraternities are in existence and functioning well, ably supported and coordinated by an Interfraternity Council. Three sororities are also operating as local groups. National affiliation is not contemplated in the immediate future. A student organization, the Central Dance Association, is responsible for scheduling the best available entertainment for a minimum of five University-wide dances each year.
ARCHITECTURAL FOUNDATION LECTURES AND EXHIBITS

The School of Architecture at Clemson is able to present annually an outstanding series of lectures, which are open to all Clemson students, through financial grants from the Clemson Architectural Foundation. The Foundation also presents an annual schedule of at least 12 art exhibits in the Architectural School gallery, which is open to the public weekdays between 9 a.m. and 4:30 p.m.

UNIVERSITY BANDS

There are three bands open to members of the student body. An entrance audition is the only prerequisite to membership. Instruments are available for those who need them and are furnished without cost.

Tiger Band. The Tiger Band and Color Guard, composed of approximately 100 members, participate in football games, pep rallies, functions, and parades throughout the South. This band has appeared in major stadiums in many states, including the Gator, Orange, Sugar, and Bluebonnet Bowls and has performed on national television. The Tiger Band makes several out-of-town trips during the fall season. A smaller “pep band” from its ranks performs at all home basketball games. Members of the Tiger Band report to the campus a few days before registration in the fall for intensive pre-school training.

Concert Band. The Clemson Concert Band is composed of the better musicians on campus. It is formed at the end of the football season, and gives concerts both on and off the campus, including a tour in the spring. This organization plays music of the great composers in addition to lighter fare.

Army and Air Force ROTC Bands. Talented students, members of the Tiger Band and Concert Band are encouraged to join the ROTC Bands. These bands participate in all major military functions, including ceremonial parades and reviews. Admission is open to all ROTC personnel.

CONCERT SERIES

The University, through the Concert Committee, brings to the campus each year a series of musical programs. This series is financed through the student activity fee and through the sale of tickets to individual subscribers.
Listed below is the program of concerts offered in 1964-1965:
Guy Lombardo and His Royal Canadians with Anita Bryant
National Swedish Chorus
Richard Leibert, Organist
The Boston Pops Orchestra with Arthur Fiedler
Van Cliburn, Pianist

THE STUDENT CENTER

The student center has a student lounge with space for reading and games and two television sets. On the third floor there are meeting rooms and the student chapel. Also in this area are the offices of student publications, such as The Tiger, student newspaper; The Taps, University annual; the engineering magazine, and Radio Station WSBF. The visitors' lounge and the information center are on the first floor off the loggia.

THE YOUNG MEN'S CHRISTIAN ASSOCIATION

The Young Men's Christian Association at Clemson was organized in 1894, one year after the college was established, and has through seventy years served both the University and the community to promote growth in Christian character through a well-balanced program of religious, social, recreational, and counseling activities. Because the YMCA is not specifically concerned with any particular denominational group, its program cuts across denominational lines and is interested in students of the University regardless of denominational affiliation or if they have no denominational affiliation.

Some of the activities which are promoted by the YMCA are the meditations in the student chapel, meditations on the halls where students live, residence hall forums, participation in the joint sponsorship of the annual campus-wide Religious Emphasis program, deputations to other colleges, universities, and high schools, and in cooperation with the overall religious program of the local church groups.

The YMCA offers space and facilities for such activities as drop-ins, dances, television programs, music concerts, as well as the physical activities such as weight lifting, basketball, swimming, and the social and recreational activities involved in the YMCA's program. For several years members of local church groups used the YMCA as headquarters or as a place of worship before the particular groups built churches adjacent to the campus. There are
still some religious groups that are using the space which is available in the YMCA.

The Young Men’s Christian Association at the University is under the direction of an Advisory Board composed of members of the faculty, administration, alumni, and members at large. There is a full-time staff of three men and one woman whose efforts are to give direction to the social, recreational, and religious life of students.

The student policy group is the YMCA Cabinet, which meets weekly to evaluate and promote the activities which appeal to students.

AUTOMOBILE PRIVILEGES AND PARKING REGULATIONS

All motor vehicles owned and operated on the campus by students, faculty, and staff members must be registered with the designated authorities. On registering, each student, faculty, or staff member will be given a copy of the parking and traffic regulations and will be issued a decal which will indicate the areas in which the car may be parked.

A student’s academic work is often adversely affected by his having and using an automobile. Accordingly, the University has adopted a policy that all students classified as freshmen, regardless of the number of years they have attended college, will not be permitted to operate or park any motor vehicle within a five-mile radius of the center of the campus except on special occasions as designated from time to time by the administration. The penalty for violating the freshman rule is severe. Upon petition by the student to the Dean of Student Affairs, exceptions may be made for commuting students living at home and for students physically handicapped.

All upperclassmen and their parents are urged to give serious consideration to whether the student should bring an automobile to the campus, especially if residence is in a dormitory. It is contemplated that in the very near future upperclassmen will be required to have a grade-point ratio required for their class to graduate in order to be permitted to have an automobile on campus.

ATHLETICS

Students are urged to take part in the intramural sports program conducted by the Athletic Department. This program includes touch football, basketball, volleyball, and softball.
It is the policy of the University to sanction and encourage athletics so long as participation does not interfere with studies and other duties. Football, baseball, basketball, and track are the most popular sports.

Clemson is a member of the Atlantic Coast Conference. In order to participate in intercollegiate athletics, the student must meet the requirements of the Atlantic Coast Conference as well as the requirements of the University.

Upon payment of the student activity fee, a portion of which is allocated to the Athletic Department, a non-transferable card is issued which entitles the student to admittance to all home athletic contests.

No member of an athletic team is eligible for a managerial position in any other branch of sport.

No team is allowed to leave the campus to participate in any match game unless accompanied by the authorized coach or other member of the faculty, who shall be responsible for the conduct of the players while away.

No student who is away without proper authority or without having complied with all the rules or orders issued by the President regarding such matters is eligible to participate in an intercollegiate contest.
SCHOLASTIC REGULATIONS
Part IV
PART IV—Scholastic Regulations

SCHOLASTIC REGULATIONS

Academic Standards. Proper discharge of all duties is required at Clemson University, and a student's first duty is his scholastic work. All students should be thoroughly acquainted with and cognizant of these basic requirements.

The Credit System. The semester hour is the basis of all credits. Generally, one recitation hour or 3 laboratory or shop hours a week for a semester constitute a semester hour. Thus, in Engl 101, English Composition, 3 cr. (3,0), as you will find this subject listed in the Degrees and Curriculums, the student takes 3 semester hours. When he completes this course satisfactorily, he is granted 3 semester credit hours on his record. The notation "3 cr. (3,0)" means that the course carries 3 credits, has 3 clock hours of theory or recitation per week, and no laboratory hours. Ch 101, General Chemistry, 4 cr. (3,3), carries 4 semester hours, has 3 hours of theory, and a 3-hour laboratory period.

The amount of work required for each credit will vary with the student's capabilities. In general, it is anticipated that each semester hour credit will require 3 hours work per week for average students. Thus, a 1(1,0) course would have 1 hour of lecture per week and require 2 hours of outside preparation. A 1(0,3) course would require 3 hours of laboratory work and no time for outside preparation.

Semester Grades. The standing of a student in his work at the end of a semester is based upon daily class work, tests or other work, and the final examinations. Faculty members may excuse from the final examinations all students having the grade of A on the work of the course prior to the final examination, but for all other students written examinations are required in all subjects at the end of each semester, except in certain laboratory or practical courses in which final examinations are not deemed necessary by the department faculty.

Scholastic reports are mailed to parents four times each year, including a preliminary statement of progress near the middle of each semester, and a final report at the end of each semester.

The Grading System. The grading system is as follows:

A—Excellent. Indicates that the student is doing work of a very high character. The highest grade given.
B—Good. Indicates work that is definitely above average, though not of the highest quality.

C—Fair. Indicates work of average or medium character.

D—Pass. Indicates work below average and unsatisfactory. The lowest passing grade.

F—Failed. Indicates that a student knows so little of the subject that it must be repeated in order that credit may be received.

I—Incomplete Work. Indicates that a relatively small part of the semester’s work remains undone. Grade I is not given a student who has made a grade F on his daily work. Students are allowed 30 days after the beginning of the next semester in which the student is enrolled to remove the incomplete grade unless (1) an extension of time is approved by the instructor concerned and the Director of Admissions and Registration, or (2) within one year of residence after receiving such a grade, a student repeats the conditioned course satisfactorily at Clemson, in which case no credit hours taken shall be recorded for the grade of I. A student who elects to repeat an incomplete course is responsible for notifying the Office of Admissions and Registration of his election during the semester in which the course is taken.

In order to make up incomplete work, the student must first obtain a permit card from the Office of Admissions and Registration. This card serves as the authority for the removal of the I and also as a form for reporting the final grade.

WP—Withdrew Passing. This grade indicates that the student withdrew from the course while doing satisfactory work. No credit hours taken are recorded for the grade of WP provided that the course is dropped prior to the last three weeks of classes in the semester. Only semester grades shall be given and recorded for courses dropped during the last three weeks.

WF—Withdrew Failing. Indicates that the student withdrew from the course while doing unsatisfactory work. The credit hours of a subject on which the grade of WF is received are counted as credits taken in computing the student’s grade-point ratio.

Dropping Class Work. A subject dropped after the first four weeks of class work is recorded as “Withdrew Passing” or “Withdrew Failing” depending upon the student’s grade in the course at the time the subject was dropped.

Upon the recommendation of the instructor and the dean concerned, a student’s standing will be investigated and he may be
required to drop a subject because of neglect, or lack of application or preparation. No student will be dropped under this rule without approval of the President.

Removal of Failures. A student who has failed (made a grade F) in a subject cannot receive credit for that subject until it has been satisfactorily repeated hour for hour in class, except that in the case of correlated laboratory work, the number of hours to be taken shall be determined by the instructor. Where separate grades for class and laboratory work are given, that part of the subject shall be repeated in which the failure occurs.

Rescheduling Courses Failed. A student who wishes to reschedule a course he has failed must do so within his next year of residence, or, if the course is not offered during this year of residence, he must reschedule the course the first time it is offered thereafter during his attendance at Clemson.

Rescheduling Courses Passed. A student may repeat a course he has passed with a grade lower than B provided he does so within three semesters of residence after the completion of his original enrollment in the course.

Scheduling Remedial Mathematics. Any student who has passed a course in freshman mathematics is ineligible to enroll in Remedial Mathematics.

Withdrawal from the University. A student may withdraw from the University any time before the last three weeks of classes in the semester without having grades recorded. A student enrolled the last three weeks of classes shall have final semester grades recorded.

A student withdrawing from college after preliminary reports are due must be passing a minimum of 12 semester credit hours at the time of withdrawal to qualify for re-enrollment the following semester.

After the first withdrawal from college the student is eligible to continue his enrollment the following semester, provided he meets other applicable regulations. For each succeeding withdrawal, however, the student shall be ineligible to continue his enrollment the following semester unless there are extenuating circumstances approved by the Committee on Admissions.

Grade Points. Four grade points are assigned for each credit hour on which the student receives the grade of A, 3 grade points for each credit hour of grade B, 2 grade points for each credit hour
of grade C, and 1 grade point for each credit hour of grade D. No grade points are assigned for grades F, I, WP, or WF.

**Grade-Point Ratio.** In calculating a student’s grade-point ratio, the total number of grade points accumulated by the student is divided by the total number of credit hours taken by the student during the semester, session, or other period for which the ratio is calculated.

**Minimum Requirements for Continuing Enrollment.** At the end of the academic year in June, all student records are inspected for quality. At that time in order to be able to continue his enrollment, a student who has taken a total of:

(a) 24 to 59 credit hours at Clemson must have a cumulative grade-point ratio of 1.20 or above.

(b) 60 to 89 credit hours at Clemson must have a cumulative grade-point ratio of 1.40 or above.

(c) 90 or more credit hours at Clemson must have a cumulative grade-point ratio of 1.60 or above.

A student who has taken fewer than 90 credit hours at Clemson and who fails to meet the required grade-point ratio, as indicated in the table above, may apply for readmission after a minimum of one semester has elapsed. A student who has taken 90 or more credit hours and fails to meet the required grade-point ratio is permanently ineligible for readmission.

**Advanced Placement by Examination.** In addition to earning credit by the usual method involving classroom attendance, students may receive credit toward their degree by completing a course successfully by examination only. Freshmen interested in exempting some of the elementary courses in this manner should participate in the College Board Advanced Placement Examination program, and have the results of these tests sent to Clemson.

**Credit by Examination.** Credit may be earned by means of a special examination without the necessity of class attendance subject to the following requirements:

(1) The applicant must present evidence which would indicate that he has received training or taken work which is approximately equivalent to that given in the course at Clemson for which an examination is requested and that an examination is warranted.

(2) The applicant must not have previously failed or audited the course at Clemson.
(3) The applicant must apply in writing for the examination and the request must be approved by the Instructor, Head of the Department in which the course is taught, Dean of the College or School in which the course is taught, and the Director of Admissions and Registration.

(4) A grade of not less than C on the examination is necessary in order for the examinee to receive credit on the course. An examinee receiving credit under this provision receives credit for "hours taken," "hours earned," and grade points as well as the course grade.

(5) The time of the examination will be arranged by the student with the instructor concerned, but must be taken within one month after the date of final approval or it will be necessary for the student to initiate another request.

Work Taken at Another Institution. Clemson students may receive credit for work taken at another institution; however, approval of the work should be obtained by the student prior to scheduling the work. Information and forms relative to this approval may be obtained in the Office of Admissions and Registration. By obtaining advance approval the student is assured of receiving proper credit at Clemson provided he passes the work with a grade one letter grade higher than the lowest passing grade.

Classification. All new students are classified as freshmen unless they have attended another college prior to entrance and have completed sufficient scholastic work as to enable them to complete the requirements for graduation from Clemson in not more than three regular sessions. No new undergraduate student, however, may be classified higher than a sophomore until one semester has been completed at Clemson.

To be classified as a sophomore, a student must have completed at least 30 semester credit hours and must have a grade-point ratio of 1.50 or above.

To be classified as a junior, a student must have completed at least 64 semester credit hours and must have a grade-point ratio of 1.60 or above.

To be classified as a senior, a student must have completed at least 95 semester credit hours and must have a grade-point ratio of 1.70 or above.

Regular Advancement in Classification. All students are urged to meet the requirements for sophomore classification by the beginning of the second year, for junior classification by the beginning
of the third year, and for senior classification by the beginning of the fourth year. Failure to meet these requirements can jeopardize a student’s academic standing with the University as well as jeopardize his deferment under the Selective Service even though he may be otherwise eligible for the deferment.

**Course Prerequisites.** Prerequisites for individual courses are enumerated under the course listings in the Description of Courses. In addition to these requirements, colleges, schools, and departments may also establish other standards as conditions for enrollment. In the College of Engineering a grade-point ratio of 1.60 or higher is required for registration in all (1) Engineering courses numbered 300 or higher, and (2) Industrial Education courses numbered 300 and higher.

**Maximum Credit Load.** The number of credits which a student may schedule in a semester is governed by his grade-point ratio—the cumulative ratio or the ratio for the previous semester, whichever is higher. The entering freshman is restricted to the requirements of his course. Under this system, class advisers have the authority to restrict the student to any one of the following limits as indicated for each ratio:

<table>
<thead>
<tr>
<th>Grade-Point Ratio Required</th>
<th>Maximum Credit Hours Which May be Scheduled as Advised by Class Adviser</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 to 0.49</td>
<td>14, 15, or 16</td>
</tr>
<tr>
<td>0.50 to 0.99</td>
<td>15, 16, or 17</td>
</tr>
<tr>
<td>1.00 to 1.49</td>
<td>16, 17, or 18</td>
</tr>
<tr>
<td>1.50 to 1.99</td>
<td>17, 18, or 19</td>
</tr>
<tr>
<td>2.00 to 2.49</td>
<td>18, 19, or 20</td>
</tr>
<tr>
<td>2.50 to 2.99</td>
<td>19, 20, or 21</td>
</tr>
<tr>
<td>3.00 to 3.49</td>
<td>20, 21, or 22</td>
</tr>
<tr>
<td>3.50 to 3.99</td>
<td>21, 22, or 23</td>
</tr>
<tr>
<td>4.00</td>
<td>22, 23, or 24</td>
</tr>
</tbody>
</table>

Students who lack more than 50 credits of meeting requirements for graduation are restricted to the regular credit limits determined by grade-point ratios.

Students who are within 50 credits of the requirements for graduation who wish to take credit loads in excess of the grade-point ratio limits may request permission for excessive registration, with such requests to be approved or disapproved by the student’s Class Adviser and Dean.
If any student schedules excessive credits, he will be automatically dropped from a sufficient number of subjects to reduce his total credits within the limits. If for any reason a student’s excessive registration continues throughout the semester, his credit on one or more subjects passed will be cancelled at the end of the semester.

**Minimum Credit Load.** When any full-time student reduces his credit load below 12 hours, but is still carrying 9 or more, he may be suspended for at least the remainder of the semester upon recommendation of the Dean of Student Affairs and approval of the President. When a student reduces his credit load below 9 hours he shall be suspended for at least the remainder of the semester.

**Auditing Policies.** Qualified students may audit courses upon the written approval of the professor, head of the department and the dean of the college or school concerned, and registration with the Director of Admissions and Registration. Auditors are under no obligation of regular attendance, preparation, recitation, or examination and receive no credit. Participation in classroom discussion and laboratory exercises by auditors is at the discretion of the instructor. A student who has previously audited a course is ineligible for credit by examination.

A full-time undergraduate student with approval may audit courses at no additional charge as long as the student’s credit load, including the course audited, does not exceed his authorized limit.

A graduate student regularly enrolled for a minimum of six semester hours may with approval audit one additional course without charge.

Members of the University teaching staff and the professional staff in research and agricultural extension may with approval audit courses without charge. Other full-time University employees may audit without charge with the additional approval of the employee’s immediate supervisor and the Comptroller.

**Residence Requirement for Graduation.** In order to qualify for an undergraduate degree, a student must spend at least the last year of residence at Clemson and complete at Clemson a minimum of 30 of the last 36 credits presented for the degree.

**Honors Program.** The Honors Program at Clemson University provides for the fuller development of our most able students. They meet in small classes with outstanding professors and explore the subject matter of a course in greater depth than other students are able to do. The identification and selection of Honor Students begins with their freshman year, and Honors courses are provided
at all four levels of undergraduate instruction. To remain in the Honors Program a student must maintain a cumulative grade-point ratio of 3.00.

An Honors Council composed of faculty members from each College and School is responsible for planning and supervising the Honors Program. *The Honors Program: A Student Handbook* is available for those who are interested.

**Honors and Awards Day.** Each spring an Honors and Awards Day is held for students who qualify for the honor list and for special awards. A cumulative grade-point ratio of 3.00 to 3.49 is required for listing with honor, 3.50 to 3.79 for high honor, and 3.80 or above for inclusion with highest honor.

**Honor Graduates.** Students who graduate in the Honors Program will have this fact indicated on their diplomas. Other graduates who meet the required qualifications are designated as having graduated with honor. A grade-point ratio of 3.00 to 3.49 is required for graduation with honor, 3.50 to 3.79 for high honor, and 3.80 or above for graduation with highest honor.

**Examination on F Received in Last Semester.** A candidate for a degree who in the semester immediately prior to graduation fails to graduate because of an F on one course taken in that semester may stand a special examination on the course provided:

1. That the candidate can furnish evidence of having done satisfactory study for the examination.
2. That the examination is not given until after the regular degree date.
3. That the candidate has fulfilled, prior to the due date for candidates' grades, all other requirements for his degree except those which can be fulfilled by passing the examination.
4. That the candidate by removing the F by examination will finish all requirements for his degree which will be awarded on the next regular date for award of degrees.

**Make-ups of I's Received in Last Semester.** A candidate for a degree who in the semester immediately prior to graduation receives one or more grades of I shall have an opportunity of removing the unsatisfactory grades provided the final grades are received in the Office of Admissions and Registration by the time grades for candidates for graduation are due.

A candidate who qualifies for graduation under this regulation will be awarded his degree on the regular date for the award of degrees.
Special Graduation Requirements. For graduation in the calendar years, 1965, 1966, and 1967 a cumulative grade-point ratio of 1.90 is required. In 1968 a cumulative grade-point ratio of 2.00 will be required. Candidates for the degrees listed above are required to apply for their degrees within four weeks following the opening of the final semester or within two weeks following the opening of the summer session prior to the date the degrees are to be awarded. These applications should be filled out in the Office of Admissions and Registration on the regular blanks provided.

All work for a degree must be completed, all financial settlements made, and all government property and library books returned by 5 p.m. on the Tuesday preceding graduation. Residence of at least the last regular session is required for graduation.

A student in line for graduation at the end of this semester who fails to graduate because of an F on one course taken this semester may stand a special examination under certain conditions on the course after the regular degree date. A senior who qualifies for graduation under this provision will be awarded his degree on the next regular date for the award of degrees. For further information see paragraph Examination on F Received in Last Semester.

A student in line for graduation at the end of a semester or summer term who meets all requirements for graduation except for a deficiency in his grade-point ratio resulting from a deficiency of not more than six grade points shall have the privilege of making up his deficiency by standing special re-examinations under certain conditions.

The examinations shall be taken after the regular degree date and in courses totaling not more than 6 semester credit hours which were passed during the last 1½ or 2 semesters of residence, and only one such examination may be taken on an individual course. When such examinations are taken under the above provision, the credit hours of the course or courses will not be counted as additional credit hours taken. Only the grade points over and above the grade points previously earned in the course may count toward raising the grade-point ratio.

A student who qualifies for graduation under this provision will be awarded his degree on the next regular date for the award of degrees.

If all work toward a degree is not completed within five years after entrance, the student may be required to take additional courses.
DEGREES AND CURRICULUMS

Part V
PART V—Degrees and Curriculums

BACHELORS' DEGREES

The degree of Bachelor of Science is awarded to those students who satisfactorily complete one of the four-year curriculums offered under the Colleges of Agriculture and Biological Sciences and Engineering, and the School of Industrial Management and Textile Science. In the College of Arts and Sciences, the Bachelor of Science degree is awarded to those students completing the requirements in Chemistry, Geology, Mathematics, Medical Technology, Physics, Pre-Medicine, and Science Teaching. The degree of Bachelor of Arts is awarded to those students who satisfactorily complete the curriculum in Arts and Sciences with a major concentration in Chemistry, Economics, English, Geology, History, Mathematics, Modern Languages, Natural Sciences, or Teaching Mathematics.

One hundred and forty-four semester credit hours are required for graduates in each of the four-year curriculums with the following exceptions:

—In Forestry, a forestry summer camp is required in addition to the 144-hour requirement.

—In the College of Arts and Sciences, requirements for a Bachelor of Arts degree vary from 128 to 135 semester hours depending on the major and minor concentrations, and Bachelor of Science degree requirements vary from 130 to 141 semester hours depending on the major course.

In the School of Architecture, two five-year programs requiring 176 semester credit hours each, lead to the Bachelor of Architecture degree and the Bachelor of Building Construction degree.

In the College of Engineering a Fifth-Year Professional Program is also offered in Civil Engineering. Graduates of this program receive the degree of Bachelor of Civil Engineering. To enter this program one must already hold the Bachelor of Science degree.

In addition to the courses prescribed in the various curriculums, each student must complete the elective credits as listed in the curriculums. Students selected for advanced ROTC may substitute courses in aerospace studies or military science for six semester credits of these electives. For example, a student enrolled in Electrical Engineering, which normally requires 144 semester hours for graduation, who completes the full ROTC program will be required to have 150 semester credit hours for graduation. Students making satisfactory progress may expect to complete the program of work with advanced ROTC in four academic years. Others must realize
that taking the full ROTC program may necessitate extending their college programs over more than eight semesters.

**GRADUATE DEGREES**

The degrees of Doctor of Philosophy, Master of Arts, Master of Science, Master of Agricultural Education, Master of Architecture, Master of Education, and Master of Industrial Education are awarded to those students who satisfactorily complete prescribed graduate programs.

For further information concerning advanced degrees see *The Graduate Bulletin*, which may be obtained from the Offices of Admissions and Registration or the Dean of the Graduate School.

**UNDERGRADUATE CURRICULUMS**

Thirty-five undergraduate curriculums are offered under the Colleges of Agriculture and Biological Sciences, Arts and Sciences, Engineering, and the Schools of Architecture and Industrial Management and Textile Science. The curriculums under each college and school are listed below:

**COLLEGE OF AGRICULTURE AND BIOLOGICAL SCIENCES**
- Agricultural Economics
- Agricultural Education
- *Agricultural Engineering*
- Agronomy
- Animal Science
- Biology
- Dairy Science
- Entomology
- Food Science
- Forestry
- Horticulture
- Poultry Science
- Pre-Veterinary

**SCHOOL OF ARCHITECTURE**
- Architecture
- Building Construction

**COLLEGE OF ARTS AND SCIENCES**
- Arts and Sciences
- Chemistry
- Geology

**COLLEGE OF ENGINEERING**
- *Agricultural Engineering*
- Ceramic Engineering
- Chemical Engineering
- Civil Engineering
- Electrical Engineering
- Industrial Education
- Industrial Engineering
- Mechanical Engineering
- Metallurgical Engineering

**SCHOOL OF INDUSTRIAL MANAGEMENT AND TEXTILE SCIENCE**
- Industrial Management
- Textile Chemistry
- Textiles

---

*Jointly administered by the College of Agriculture and Biological Sciences and the College of Engineering.*

*Pre-Dental students take a modified Pre-Medicine curriculum.*
In the curriculums which follow are given the official title and number of the course, the descriptive title, the number of semester hours credit, and in parentheses the number of hours per week in class and laboratory, respectively.

COLLEGE OF AGRICULTURE AND BIOLOGICAL SCIENCES

Modern agriculture is the science and art of producing, processing, and distributing plant and animal products, including those aspects of economics and human relations connected with these activities. Agriculture is a unique area in education because it applies the basic sciences to biological material for economic implications.

Today's agriculture includes much more than farm production. About 6 million people provide supplies and services for farmers and 10 million process and distribute farm products. These two segments together with farm production, which employs 7 million workers, provide jobs somewhere in agriculture for 23 million Americans—approximately one-third of all jobs.

Thousands of agricultural graduates are needed each year in this basic industry. Our land-grant colleges and universities are now graduating about 6,000 students in agricultural majors each year—less than one-half of the total number needed to fill jobs available each year—jobs important to every person, jobs with futures, jobs with challenge, jobs with personal and financial rewards.

Biology is the science of life—both plant and animal, including man. It is one of the most dynamic areas of human knowledge—a science with a future. The National Science Foundation has estimated that we will need 65,000 biological scientists in 1970, an increase of 73 per cent over the number employed in 1959. Most of the jobs are in educational institutions, federal, state and local governments and private industries.

The College of Agriculture and Biological Sciences is composed of three main divisions: Resident Instruction, Research (Agricultural Experiment Station), and Extension (Agricultural Extension Service). Organized under the Division of Resident Instruction are curriculums in Agricultural Economics, Agricultural Education, Agricultural Engineering, Agronomy, Animal Science, Biology, Dairy Science, Entomology, Food Science, Forestry, Horticulture, Poultry Science, and Pre-Veterinary Medicine.

* Jointly administered by the College of Agriculture and Biological Sciences and the College of Engineering.
The College of Agriculture and Biological Sciences continuously modernizes its curriculums. In this connection, students in many of the curriculums now have the opportunity to specialize by choosing an option in Science, Business, or Production Technology.

**Science Option**—This option emphasizes the basic sciences that prepare students to contribute to the advancement of knowledge in their respective fields. It is designed for students whose anticipated field of work requires considerable scientific training, usually including graduate studies. Employment opportunities include research with State Agricultural Experiment Stations, the United States Department of Agriculture, and industrial and commercial organizations; and teaching in colleges of agriculture, and other educational work with Federal, State and industrial organizations.

**Business Option**—This option emphasizes principles and practices of business management as applied to businesses and industries associated with agriculture. It is designed for students who plan to work with one of the many businesses and industries that provide supplies and services for the farmer, and process and distribute farm products. Employment opportunities include work related to meat and poultry processing, sales and service of farm machinery, manufacturing and sales of fertilizers and pesticides, dairy and food processing, grain and seed processing, feed manufacturing, banking and credit, insurance, farm management, land appraising, and the marketing of agricultural commodities.

**Production Technology Option**—This option emphasizes the application of scientific principles to agricultural production. It is designed for students whose anticipated field of work requires broad general training in scientific and practical agriculture. Employment opportunities include general and specialized farming; agricultural extension services; teaching vocational agriculture; conservation of natural resources; agricultural communication; and agricultural services of the United States Department of Agriculture, State Departments of Agriculture, and private enterprises.

To illustrate further the types of work in which graduates engage, a few of the many occupations of agricultural graduates are listed under each curriculum.
BASIC CURRICULUM

Required of all students planning to major in Agricultural Economics, Agricultural Education, Agronomy, Animal Science, Dairy Science, Entomology, Horticulture or Poultry Science

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td><strong>Second Semester</strong></td>
</tr>
<tr>
<td>AgBio 101 Introd. to Agric. and Biol. Sci.</td>
<td>Agron 102 Crop Science 3 (2,3)</td>
</tr>
<tr>
<td>Bot 101 Gen. Botany</td>
<td>An Sc 102 Animal Science* 2 (2,0)</td>
</tr>
<tr>
<td>Ch 101 Gen. Chemistry</td>
<td>An Sc 104 Animal Science Lab.* 1 (0,3)</td>
</tr>
<tr>
<td>Engl 101 English Composition</td>
<td>Ch 102 Gen. Chemistry 4 (3,3)</td>
</tr>
<tr>
<td>Math 105 Alg. and Trig.</td>
<td>Engl 102 English Composition 3 (3,0)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>Math 106 Algebra 4 (4,0)</td>
</tr>
<tr>
<td></td>
<td>Animal Science Lab.° 1 (0,3)</td>
</tr>
<tr>
<td></td>
<td>Zool 101 Gen. Zoology 3 (3,0)</td>
</tr>
<tr>
<td></td>
<td>Zool 103 Gen. Zoology Lab. 1 (0,3)</td>
</tr>
<tr>
<td></td>
<td>AS or MS—Basic 1 (2,1)</td>
</tr>
<tr>
<td>17</td>
<td>18</td>
</tr>
</tbody>
</table>

- Students planning to major in Ornamental Horticulture may substitute EG 101 and CE 200 for An Sc 102 and 104.
- Students planning to choose the Science Option should schedule Math 106 in the second semester of the freshman year.

AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

Currently the curriculum in Agricultural Economics and Rural Sociology provides for two options—Science and Business. In general the Business option is the equivalent of a major in Agricultural Business Administration with a strong background in agricultural and biological science. Those who select this option would not normally expect to pursue their formal training much beyond the bachelor’s degree. The Science option on the other hand has been designed primarily for those who expect to become professional agricultural economists or rural sociologists and whose plans for education would likely include some work at the graduate level.

Employment opportunities open to graduates with degrees in Agricultural Economics are many. They include research and teaching in institutions of higher learning; sales and promotional work for a variety of businesses; management positions in the farm loan departments of private banks or with cooperative farm credit agencies; public relations activities for various firms; market managers and directors; county agents; representatives of government agencies serving agriculture; and operators of numerous enterprises.
**AGRICULTURAL ECONOMICS CURRICULUM**

*(See page 116 for Freshman Year)*

### SCIENCE OPTION

#### SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th></th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acct 201 Prin. of Accounting</strong></td>
<td>3 (3.0)</td>
<td><strong>Ag Ec 202 Agric. Economics</strong></td>
</tr>
<tr>
<td><strong>Agro 202 Soils</strong></td>
<td>3 (2.3)</td>
<td><strong>Econ 202 Principles of Econ.</strong></td>
</tr>
<tr>
<td><strong>Econ 201 Principles of Econ.</strong></td>
<td>3 (3.0)</td>
<td><strong>Engl 204 Survey of Engl. and Amer. Lit.</strong></td>
</tr>
<tr>
<td><strong>Engl 203 Survey of Engl. Lit.</strong></td>
<td>3 (3.0)</td>
<td><strong>Math 205 Anal. Geom., Cal. II</strong></td>
</tr>
<tr>
<td><strong>Math 106 Anal. Geom., Cal. I</strong></td>
<td>4 (4.0)</td>
<td><strong>Phys 201 Gen. Physics</strong></td>
</tr>
<tr>
<td><strong>AS or MS—Basic.</strong></td>
<td>1 (2.1)</td>
<td><strong>Phys 203 Gen. Physics Lab.</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>17</td>
<td><strong>AS or MS—Basic.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Junior Year</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ag Ec 309 Introd. to Marketing</strong></td>
<td>3 (3.0)</td>
</tr>
<tr>
<td><strong>Ag Ec 460 Agric. Finance</strong></td>
<td>2 (2.0)</td>
</tr>
<tr>
<td><strong>Econ 302 Money and Banking</strong></td>
<td>3 (3.0)</td>
</tr>
<tr>
<td><strong>Gov 301 Am. Gov. and Pol. Par.</strong></td>
<td>3 (3.0)</td>
</tr>
<tr>
<td><strong>Psych 301 Gen. Psychology</strong></td>
<td>3 (3.0)</td>
</tr>
<tr>
<td><strong>Approved Electives§</strong></td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>18</td>
</tr>
</tbody>
</table>

#### SENIOR YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th></th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ag Ec 405 Seminar</strong></td>
<td>1 (1.0)</td>
<td><strong>Ag Ec 406 Seminar</strong></td>
</tr>
<tr>
<td><strong>Engl 304 Advanced Comp.</strong></td>
<td>3 (3.0)</td>
<td><strong>Ag Ec 452 Agric. Policy</strong></td>
</tr>
<tr>
<td><strong>Ex St 401 Introd. Statistics</strong></td>
<td>3 (2.3)</td>
<td><strong>Ag Ec 456 Prices</strong></td>
</tr>
<tr>
<td><strong>Gen 302 Genetics</strong></td>
<td>3 (2.3)</td>
<td><strong>Engl 301 Public Speaking</strong></td>
</tr>
<tr>
<td><strong>Economics Elective†</strong></td>
<td>3</td>
<td><strong>Ex St 462 Stat. Appl. to Econ.</strong></td>
</tr>
<tr>
<td><strong>Approved Electives§</strong></td>
<td>6</td>
<td><strong>Approved Electives‡</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>19</td>
<td><strong>Approved Electives‡</strong></td>
</tr>
</tbody>
</table>

*Of the 22 hours of approved electives a minimum of 9 hours must be taken in other departments in the College of Agriculture and Biological Sciences.

† To be selected from the following courses: Econ 314, Econ 403, Econ 404, Econ 407, Econ 412, Econ 416, For 304, Hist 306, IM 404.

### BUSINESS OPTION

#### SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th></th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agron 202 Soils</strong></td>
<td>3 (2.3)</td>
<td><strong>Acct 201 Prin. of Accounting</strong></td>
</tr>
<tr>
<td><strong>Econ 201 Principles of Econ.</strong></td>
<td>3 (3.0)</td>
<td><strong>Ag Ec 202 Agric. Economics</strong></td>
</tr>
<tr>
<td><strong>Engl 203 Survey of Engl. Lit.</strong></td>
<td>3 (3.0)</td>
<td><strong>Econ 202 Principles of Econ.</strong></td>
</tr>
<tr>
<td><strong>IM 201 Introd. to Ind. Mgt.</strong></td>
<td>3 (3.0)</td>
<td><strong>Engl 204 Survey of Engl. and Amer. Lit.</strong></td>
</tr>
<tr>
<td><strong>Math 106 Anal. Geom., Cal. 1§</strong></td>
<td>4 (4.0)</td>
<td><strong>Gov 301 Am. Gov. and Pol. Par.</strong></td>
</tr>
<tr>
<td><strong>AS or MS—Basic.</strong></td>
<td>1 (2.1)</td>
<td><strong>Phys 201 Gen. Physics</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>17</td>
<td><strong>Phys 203 Gen. Physics Lab.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Junior Year</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ag Ec 309 Introd. to Marketing</strong></td>
<td>3 (3.0)</td>
</tr>
<tr>
<td><strong>Ag Ec 331 Advertising and Merch.</strong></td>
<td>3 (3.0)</td>
</tr>
<tr>
<td><strong>Hist 301 U. S. Since 1865</strong></td>
<td>3 (3.0)</td>
</tr>
<tr>
<td><strong>Psych 301 Gen. Psychology</strong></td>
<td>3 (3.0)</td>
</tr>
<tr>
<td><strong>Approved Electives‡</strong></td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>19</td>
</tr>
</tbody>
</table>

#### SENIOR YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th></th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ag Ec 405 Seminar</strong></td>
<td>1 (1.0)</td>
<td><strong>Ag Ec 406 Seminar</strong></td>
</tr>
<tr>
<td><strong>Ag Ec 451 Agric. Cooperation</strong></td>
<td>2 (2.0)</td>
<td><strong>Ag Ec 452 Agric. Policy</strong></td>
</tr>
<tr>
<td><strong>Engl 304 Advanced Comp.</strong></td>
<td>3 (3.0)</td>
<td><strong>Ag Ec 456 Prices</strong></td>
</tr>
<tr>
<td><strong>Ex St 401 Introd. Statistics</strong></td>
<td>3 (2.3)</td>
<td><strong>Engl 301 Public Speaking</strong></td>
</tr>
<tr>
<td><strong>Gen 302 Genetics</strong></td>
<td>3 (2.3)</td>
<td><strong>Ex St 462 Stat. Appl. to Econ.</strong></td>
</tr>
<tr>
<td><strong>Business Elective†</strong></td>
<td>3</td>
<td><strong>Approved Electives‡</strong></td>
</tr>
<tr>
<td><strong>Approved Electives‡</strong></td>
<td>3</td>
<td><strong>Approved Electives‡</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>18</td>
<td><strong>Approved Electives‡</strong></td>
</tr>
</tbody>
</table>

*With approval of class adviser Ch 220 may be substituted for Math 106.

† Of the 21 hours of approved electives a minimum of 9 hours must be taken in other departments in the College of Agriculture and Biological Sciences.

‡ To be selected from the following courses: Acct 202, Ag Ec 361, Econ 301, Econ 302, Econ 312, IM 301, IM 302, IM 304, IM 307, IM 402.
AGRICULTURAL EDUCATION

This curriculum, organized within the framework of the Production Technology option, is designed primarily for students who wish to prepare for positions in vocational agriculture. It is also appropriate for those who plan to engage in other forms of rural educational work, such as agricultural missionary, public relations, and agricultural extension. In addition many graduates enter farming, soil conservation and other governmental work whereas others are employed in business and industry.

The curriculum provides for a broad training in agriculture as well as general and professional education, including student teaching.

AGRICULTURAL EDUCATION CURRICULUM
(See page 116 for Freshman Year)

<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td><strong>Second Semester</strong></td>
</tr>
<tr>
<td>Ag Ed 201 Introd. to Ag. Ed.</td>
<td>Ag Ec 202 Agric. Economics 3 (3,3)</td>
</tr>
<tr>
<td>Agron 202 Soils</td>
<td>AgE 205 Farm Shop 3 (3,3)</td>
</tr>
<tr>
<td>Econ 201 Principles of Econ.</td>
<td>AgE 206 Agric. Mechanization 3 (3,3)</td>
</tr>
<tr>
<td>Phys 201 Gen. Physics</td>
<td>Amer. Lit. 3 (3,0)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>PS 201 Introd. to Poultry Sc. 3 (3,3)</td>
</tr>
<tr>
<td></td>
<td>AS or MS—Basic 1 (2,1)</td>
</tr>
<tr>
<td></td>
<td><strong>17</strong></td>
</tr>
<tr>
<td><strong>Junior Year</strong></td>
<td><strong>19</strong></td>
</tr>
<tr>
<td>AgE 301 Soil Conservation</td>
<td>Ag Ec 452 Agric. Policy 3 (3,0)</td>
</tr>
<tr>
<td>Dy Sc 201 Introd. Dairying</td>
<td>An Sc 301 Feeds and Feeding 3 (3,0)</td>
</tr>
<tr>
<td>Engl 301 Public Speaking</td>
<td>Ed 302 Edu. Psychology 3 (3,0)</td>
</tr>
<tr>
<td>Gov 301 Am. Gov. and Pol. Par.</td>
<td>For 307 Farm Forestry 3 (3,3)</td>
</tr>
<tr>
<td>Hort 464 Food Preservation*</td>
<td>RS 301 Rural Sociology 3 (3,0)</td>
</tr>
<tr>
<td>Approved Elective</td>
<td>Approved Elective 3</td>
</tr>
<tr>
<td></td>
<td><strong>18</strong></td>
</tr>
<tr>
<td><strong>Senior Year</strong></td>
<td><strong>18</strong></td>
</tr>
<tr>
<td>Ag Ec 302 Farm Management</td>
<td>Ag Ed 401 Methods in Ag. Educ. 3 (2,3)</td>
</tr>
<tr>
<td>Agron 301 Fertilizers</td>
<td>Ag Ed 406 Directed Teaching 6 (0,18)</td>
</tr>
<tr>
<td>Bot 401 Plant Pathology</td>
<td>Eg Ed 422 Introd. to Adult Educ. 3 (3,3)</td>
</tr>
<tr>
<td>Ent 301 Elem. and Econ. Ent.</td>
<td>Ed 458 Health Educ.† 3 (3,0)</td>
</tr>
<tr>
<td>Hort 407 Landscape Design</td>
<td>Music 310 Music Appreciation † 3 (3,0)</td>
</tr>
<tr>
<td>Approved Elective</td>
<td><strong>19</strong></td>
</tr>
<tr>
<td></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

* Hort 302 or 305 or 352 or 451 or 456 may be substituted upon approval of the class adviser.

† Students electing Advanced AS or MS must schedule Ed 458 or Music 310 prior to the second semester of the senior year.

AGRONOMY

The curriculum in Agronomy deals with crop and soil science. Trained agronomists may choose their life work from many different fields that relate to soils and crops. The work they choose may range from the highly applied (farming) to the highly abstract (basic research). Between these extremes are the college and high school teaching, the extension service, and soil conservation work.
Fertilizer companies and manufacturers of weed control chemicals conduct research, sales, and technical services that employ agronomists. Large seed companies are looking for plant breeders and other men trained in agronomy to direct their production programs. Recently, opportunities have intensified for soil scientists to make land appraisals for tax commissions and others. Agronomists hold many important administrative positions. Some are doing technical work with Foundations in Asia and South America.

Options may be chosen in either Science, Business or Production Technology.

**AGRONOMY CURRICULUM**

*(See page 116 for Freshman Year)*

### SCIENCE OPTION

#### SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 325 Org. Chem.</td>
<td>Agron 202 Soils</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>AS or MS—Basic</td>
</tr>
</tbody>
</table>

**16**

#### JUNIOR YEAR

| Bact 301 Gen. Bacteriology | Bot 352 Plant Physiology |
| Econ 201 Principles of Econ. | Engl 301 Public Speaking |
| Gen 302 Genetics | Approved Electives† |
| Math 206 Anal. Geom., Cal. III | **12** |
| Social Science Elective* | **12** |

**19**

#### SENIOR YEAR

| Agron 455 Seminar | Agron 405 Plant Breeding |
| Bot 401 Plant Pathology | or Bact 410 Soil Microbiology |
| Ex St 401 Introd. Statistics | Agron 456 Seminar |
| Approved Electives† | Gov 301 Am. Gov. and Pol. Par. |

**12**

**19**

*To be selected from the following courses: Geog 301, Geog 302, Hist 301, Psych 301, RS 301, Soc 301.

†At least nine credits must be taken from the following courses: Agron 301, Agron 306, Agron 308, Agron 401, Agron 403, Agron 407, Agron 409, Agron 452, Hort 468.

### BUSINESS OPTION

#### SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 220 Elem. Org. Chem.</td>
<td>Acct 201 Prin. of Accounting</td>
</tr>
<tr>
<td>Econ 201 Principles of Econ.</td>
<td>Ag Ec 202 Agric. Economics</td>
</tr>
<tr>
<td>Hort Elective</td>
<td><strong>3 (3.0)</strong></td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>Phys 201 Gen. Physics</td>
</tr>
</tbody>
</table>

**3 (3.0)**

**17**
### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agron 301 Fertilizers</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Bact 301 Gen. Bacteriology</td>
<td>4 (3.3)</td>
</tr>
<tr>
<td>Engl 301 Public Speaking</td>
<td>3 (5.0)</td>
</tr>
<tr>
<td>Gen 302 Genetics</td>
<td>3 (2.3)</td>
</tr>
<tr>
<td>Social Science Elective*</td>
<td>3</td>
</tr>
<tr>
<td>Approved Elective†</td>
<td>3</td>
</tr>
</tbody>
</table>

### Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Ec 309 Intro. to Marketing</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Agron 306 Forage &amp; Pasture Crops</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Agron 308 Phys. &amp; Chem. Edaph.</td>
<td>3 (1.6)</td>
</tr>
<tr>
<td>Bot 352 Plant Physiology</td>
<td>4 (3.3)</td>
</tr>
<tr>
<td>Approved Electives†</td>
<td>6</td>
</tr>
</tbody>
</table>

### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agron 405 Plant Breeding</td>
<td>3 (2.3)</td>
</tr>
<tr>
<td>Agron 452 Soil Fert. and Mgt.</td>
<td>2 (2.0)</td>
</tr>
<tr>
<td>Agron 456 Seminar</td>
<td>1 (1.0)</td>
</tr>
<tr>
<td>Gov 301 Am. Gov. and Pol. Par.</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Approved Electives†</td>
<td>9</td>
</tr>
</tbody>
</table>

### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agron 401 Adv. Crop &amp; Seed Lab.</td>
<td>1 (0.3)</td>
</tr>
<tr>
<td>Agron 408 Soil Classification</td>
<td>2 (1.3)</td>
</tr>
<tr>
<td>Agron 407 Prin. of Weed Control</td>
<td>3 (2.3)</td>
</tr>
<tr>
<td>Agron 409 Cotton &amp; Tobacco</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Agron 455 Seminar</td>
<td>1 (1.0)</td>
</tr>
<tr>
<td>Bot 401 Plant Pathology</td>
<td>3 (2.3)</td>
</tr>
<tr>
<td>Approved Electives†</td>
<td>6</td>
</tr>
</tbody>
</table>

### Production Technology Option

#### Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 220 Elem. Org. Chem.</td>
<td>4 (3.3)</td>
</tr>
<tr>
<td>Econ 201 Principles of Econ.</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Engl 205 Survey of Engl. Lit.</td>
<td>3 (5.0)</td>
</tr>
<tr>
<td>Phys 201 Gen. Physics</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Phys 203 Gen. Physics Lab.</td>
<td>1 (0.3)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2.1)</td>
</tr>
<tr>
<td>Approved Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

### Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Ec 302 Farm Management</td>
<td>3 (2.3)</td>
</tr>
<tr>
<td>AgE 301 Soil Conservation</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Agron 301 Fertilizers</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Bact 301 Gen. Bacteriology</td>
<td>4 (3.3)</td>
</tr>
<tr>
<td>Ent 301 Elem. and Econ. Ent.</td>
<td>3 (2.3)</td>
</tr>
<tr>
<td>Social Science Elective*</td>
<td>3</td>
</tr>
</tbody>
</table>

### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agron 401 Adv. Crop &amp; Seed Lab.</td>
<td>1 (0.3)</td>
</tr>
<tr>
<td>Agron 403 Soil Classification</td>
<td>2 (1.3)</td>
</tr>
<tr>
<td>Agron 407 Prin. of Weed Control</td>
<td>3 (2.3)</td>
</tr>
<tr>
<td>Agron 409 Cotton &amp; Tobacco</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Agron 455 Seminar</td>
<td>1 (1.0)</td>
</tr>
<tr>
<td>Bot 401 Plant Pathology</td>
<td>3 (2.3)</td>
</tr>
<tr>
<td>Approved Electives</td>
<td>4</td>
</tr>
</tbody>
</table>

### Production Technology Option

#### To be selected from the following courses: Geog 301, Geog 302, Hist 301, Psych 301, RS 301, Soc 301.

### Animal Science

The Animal Science Department emphasizes subject matter dealing with the application of scientific principles to livestock production and processing.

Occupations for Animal Science graduates include livestock farming; cattle, swine and sheep breeding; extension livestock specialists; feed specialists; county agents; teaching and research in...
animal industry; positions with meat packing companies; feed dealers; freezer locker operators; livestock dealers; and livestock commission brokers.

The Animal Science Department offers options in Science, Business and Production Technology.

**ANIMAL SCIENCE CURRICULUM**
(See page 116 for Freshman Year)

### SCIENCE OPTION

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sophomore Year</strong></td>
<td><strong>Second Semester</strong></td>
</tr>
<tr>
<td>Ch 323 Org. Chem.</td>
<td>Agron 202 Soils</td>
</tr>
<tr>
<td>Ch 327 Org. Chem. Lab.</td>
<td>Econ 201 Principles of Econ.</td>
</tr>
<tr>
<td>Phys 203 Gen. Physics Lab.</td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>Chemistry Elective*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Junior Year</th>
<th>Senior Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>An Sc 301 Feeds and Feeding</td>
<td>An Sc 406 Judging</td>
</tr>
<tr>
<td>An Sc 303 Feeds and Feeding Lab.</td>
<td>Bact 301 Gen. Bacteriology</td>
</tr>
<tr>
<td>An Sc 353 Meats</td>
<td>Engl 301 Public Speaking</td>
</tr>
<tr>
<td>An Sc 355 Meats Lab.</td>
<td>Gen 302 Genetics</td>
</tr>
<tr>
<td>Social Science Elective†</td>
<td>Approved Elective†</td>
</tr>
<tr>
<td>3 (3,0)</td>
<td>2 (1,3)</td>
</tr>
<tr>
<td>1 (0,3)</td>
<td>4 (3,3)</td>
</tr>
<tr>
<td>1 (1,0)</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>2 (0,6)</td>
<td>3 (2,3)</td>
</tr>
<tr>
<td>3 (2,3)</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

| 16 | 18 or 19 |

### BUSINESS OPTION

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sophomore Year</strong></td>
<td><strong>Second Semester</strong></td>
</tr>
<tr>
<td>Agron 202 Soils</td>
<td>Acct 201 Prin. of Accounting</td>
</tr>
<tr>
<td>Ch 220 Elem. Org. Chem.</td>
<td>Ag Ec 202 Agric. Economics</td>
</tr>
<tr>
<td>Econ 201 Principles of Econ.</td>
<td>Engl 204 Survey of Engl. and Amer. Lit.</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td>3 (2,3)</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>4 (3,3)</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>3 (3,0)</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>3 (3,0)</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>1 (2,1)</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>17</td>
<td>4</td>
</tr>
</tbody>
</table>

### Notes

- Ch 310, Ch 316, or Ch 324 and Ch 328.
- † To be selected from the following courses: Geog 301, Geog 302, Hist 301, Psych 301, RS 301, Soc 301.
- † Two of the following courses must be completed: An Sc 401, 407, or 410. One of the following lab courses must also be completed: An Sc 403, 409, or 410. The lab taken must correspond to one of the theory courses selected.

---

*Animal Science 121*
### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>An Sc 301 Feeds and Feeding</td>
<td>3</td>
</tr>
<tr>
<td>An Sc 303 Feeds and Feeding Lab.</td>
<td>1</td>
</tr>
<tr>
<td>An Sc 353 Meats</td>
<td>1</td>
</tr>
<tr>
<td>An Sc 355 Meats Lab.</td>
<td>2</td>
</tr>
<tr>
<td>Engl 301 Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>Gen 302 Genetics</td>
<td>3</td>
</tr>
<tr>
<td>Approved Electives*</td>
<td>6</td>
</tr>
</tbody>
</table>

**Total Credits: 19**

### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Ec 309 Intro. to Marketing</td>
<td>3</td>
</tr>
<tr>
<td>An Sc 306 Judging</td>
<td>2</td>
</tr>
<tr>
<td>Bact 301 Gen. Bacteriology</td>
<td>4</td>
</tr>
<tr>
<td>Gov 301 Am. Gov. and Pol. Par.</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Elective†</td>
<td>3</td>
</tr>
<tr>
<td>Approved Elective*</td>
<td>4</td>
</tr>
</tbody>
</table>

**Total Credits: 19**

### Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 220 Elem. Org. Chem.</td>
<td>4</td>
</tr>
<tr>
<td>Econ 201 Principles of Econ.</td>
<td>3</td>
</tr>
<tr>
<td>Engl 203 Survey of Eng. Lit.</td>
<td>3</td>
</tr>
<tr>
<td>Zool 307 Animal Anat. &amp; Phys.</td>
<td>3</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1</td>
</tr>
<tr>
<td>Approved Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credits: 17**

### Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agron 301 Fertilizers</td>
<td>3</td>
</tr>
<tr>
<td>An Sc 301 Feeds and Feeding</td>
<td>3</td>
</tr>
<tr>
<td>An Sc 303 Feeds and Feeding Lab.</td>
<td>1</td>
</tr>
<tr>
<td>An Sc 353 Meats</td>
<td>1</td>
</tr>
<tr>
<td>An Sc 355 Meats Lab.</td>
<td>2</td>
</tr>
<tr>
<td>Gov 301 Am. Gov. and Pol. Par.</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Elective*</td>
<td>3</td>
</tr>
<tr>
<td>Approved Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credits: 19**

### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>An Sc 401 Beef Production</td>
<td>3</td>
</tr>
<tr>
<td>An Sc 403 Beef Production Lab.</td>
<td>1</td>
</tr>
<tr>
<td>An Sc 407 Horse &amp; Sheep Prod. Lab.</td>
<td>2</td>
</tr>
<tr>
<td>An Sc 409 Horse &amp; Sheep Prod. Lab.</td>
<td>1</td>
</tr>
<tr>
<td>Dy Sc 403 Animal Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>Dy Sc 453 Animal Reprod.</td>
<td>3</td>
</tr>
<tr>
<td>Ent 301 Elem. and Econ. Ent.</td>
<td>1</td>
</tr>
<tr>
<td>Approved Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total Credits: 19**

* To be selected from the following courses: Geog 301, Geog 302, Hist 301, Psych 301, RS 301, Soc 301.

### DAIRY SCIENCE

Selected studies of fundamental and technical nature, superimposed upon the required basic science core of the Dairy Science curriculum, enable students to acquire the perspective, understanding, and proficiency necessary to enter a demanding, rewarding, and
respected industry. The production and processing areas in the Dairy Science curriculum emphasize understanding based on scientific principles, explaining why the tenets are true. Somewhat less emphasis is given to phases of technology concerned with how to do things, but these areas are given good coverage.

Required and suggested studies in Arts and Sciences plus courses selected by the student in areas of personal interest complete the educational program designed to fit the graduate for his total lifework.

Occupational opportunities for dairy science graduates include management of production and processing facilities, teaching research, and extension work, quality control work for processing units and production organizations, public health service, industrial promotion and public relations work in both production and processing fields, dairy and food products engineering, special services, and educational work in non-institutional fields. Special service opportunities are available in areas of state and national breed association work, breeding organizations, industrial supplies, production and processing equipment and supplies. Opportunities in educational activities not connected with schools and colleges include positions with industrial associations, state and federal services, and federal programs with foreign assignments.

The Dairy Science curriculum has three self-contained options—Science, Business, and Production Technology.

DAIRY SCIENCE CURRICULUM
(See page 116 for Freshman Year)

<table>
<thead>
<tr>
<th>SCIENCE OPTION</th>
<th>SOPHOMORE YEAR</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First Semester</td>
<td>Agron 209 Soils</td>
</tr>
<tr>
<td>Ch 323 Org. Chem.</td>
<td>3 (3,0)</td>
<td>Ch 324 Org. Chem.</td>
</tr>
<tr>
<td>Ch 327 Org. Chem. Lab.</td>
<td>1 (0,3)</td>
<td>Ch 328 Org. Chem. Lab.</td>
</tr>
<tr>
<td>Econ 201 Principles of Econ.</td>
<td>3 (5,0)</td>
<td>Dy Sc 201 Introd. Dairying</td>
</tr>
<tr>
<td>Engl 203 Survey of Engl. Lit.</td>
<td>3 (5,0)</td>
<td>Engl 204 Survey of Engl. and Americ. Lit.</td>
</tr>
<tr>
<td>Phys 201 Gen. Physics</td>
<td>3 (3,0)</td>
<td>Phys 204 Gen. Physics Lab.</td>
</tr>
<tr>
<td>Phys 203 Gen. Physics Lab.</td>
<td>1 (0,3)</td>
<td>AS or MS—Basic.</td>
</tr>
<tr>
<td>AS or MS—Basic.</td>
<td>1 (2,1)</td>
<td>19</td>
</tr>
<tr>
<td>19</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

JUNIOR YEAR

<table>
<thead>
<tr>
<th>Sharing Courses</th>
<th>Ch 310 Agric. Biochemistry</th>
<th>Dy Sc 310 D. Cattle Selection</th>
<th>Dy Sc 300 Sensory Eval. Tech.</th>
</tr>
</thead>
<tbody>
<tr>
<td>An Sc 301 Feeds and Feeding</td>
<td>3 (3,0)</td>
<td>or Dy Sc 310 D. Cattle Selection</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>Dy Sc 305 Dairy Tech. &amp; Engr.</td>
<td>3 (2,3)</td>
<td>Dy Sc 306 Ch. &amp; Phys. Nat. of Milk</td>
<td>2 (1,3)</td>
</tr>
<tr>
<td>Dy Sc 307 Market Milk*</td>
<td>3 (2,3)</td>
<td>Gen 302 Genetics</td>
<td>3 (2,3)</td>
</tr>
<tr>
<td>Engl 301 Public Speaking</td>
<td>3 (5,0)</td>
<td>Gov 301 Am. Gov. and Pol. Par.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Social Science Elective†</td>
<td>3 (3,0)</td>
<td>18 or 17</td>
<td></td>
</tr>
<tr>
<td>Approved Elective</td>
<td>3</td>
<td>19</td>
<td></td>
</tr>
</tbody>
</table>
### Degrees and Curriculums

#### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bact 402 Dairy Bacteriology</td>
<td>3</td>
</tr>
<tr>
<td>Dy Sc 408 Animal Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>Dy Sc 409 Dairy Seminar</td>
<td>2</td>
</tr>
<tr>
<td>Dy Sc 453 Animal Reprod.</td>
<td>3</td>
</tr>
<tr>
<td>Dy Sc 305 Animal Reprod. Lab†</td>
<td>1</td>
</tr>
<tr>
<td>Zool 307 Animal Anst. &amp; Phys.</td>
<td>3</td>
</tr>
<tr>
<td>Approved Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

18

#### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>An Sc 452 Animal Breeding</td>
<td>3</td>
</tr>
<tr>
<td>or Dy Sc 404 Dairy Plant Mgt.</td>
<td>3</td>
</tr>
<tr>
<td>Dy Sc 410 Dairy Seminar</td>
<td>2</td>
</tr>
<tr>
<td>Dy Sc 452 Dairy Cattle Feed.</td>
<td>2</td>
</tr>
<tr>
<td>Dy &amp; Mgt.</td>
<td>3</td>
</tr>
<tr>
<td>Ex St 401 Introd. Statistics</td>
<td>3</td>
</tr>
<tr>
<td>Approved Electives</td>
<td>6</td>
</tr>
</tbody>
</table>

17 - 18

* Taught only in academic years ending with odd number (example 1964-1965).
† Dy Sc 402 may be substituted for Dy Sc 453 and 455. Dy Sc 402 will be taught in second semester of academic years ending in even number (example 1965-1966).
‡ To be selected from the following courses: Geog 301, Geog 302, Hist 301, Psych 301, RS 301, Soc 301.

#### Business Option

#### Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acct 201 Prin. of Accounting</td>
<td>3</td>
</tr>
<tr>
<td>Ch 220 Elem. Org. Chem.</td>
<td>4</td>
</tr>
<tr>
<td>Econ 201 Principles of Econ.</td>
<td>3</td>
</tr>
<tr>
<td>Engl 203 Survey of Engl. Lit.</td>
<td>3</td>
</tr>
<tr>
<td>Phys 201 Gen. Physics</td>
<td>3</td>
</tr>
<tr>
<td>Phys 203 Gen. Physics Lab.</td>
<td>1</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1</td>
</tr>
</tbody>
</table>

18

#### Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Ec 202 Agric. Economics</td>
<td>3</td>
</tr>
<tr>
<td>Agron 202 Soils</td>
<td>3</td>
</tr>
<tr>
<td>Dy Sc 201 Introd. Dairying</td>
<td>3</td>
</tr>
<tr>
<td>Engl 204 Survey of Engl. and Amer. Lit.</td>
<td>3</td>
</tr>
<tr>
<td>IM 201 Introd. to Indust. Mgt.</td>
<td>3</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1</td>
</tr>
</tbody>
</table>

19

#### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bact 301 Gen. Bacteriology</td>
<td>3</td>
</tr>
<tr>
<td>Dy Sc 305 Dairy Tech. &amp; Engr.</td>
<td>3</td>
</tr>
<tr>
<td>Dy Sc 307 Market Milk*</td>
<td>3</td>
</tr>
<tr>
<td>Engl 301 Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>Social Science Elective†</td>
<td>3</td>
</tr>
<tr>
<td>Approved Electives§</td>
<td>3</td>
</tr>
</tbody>
</table>

19

* Taught only in academic years ending with odd number (example 1964-1965).
† Dy Sc 402 may be substituted for Dy Sc 453 and 455. Dy Sc 402 will be taught in second semester of academic years ending in even number (example 1965-1966).
‡ To be selected from the following courses: Geog 301, Geog 302, Hist 301, Psych 301, RS 301, Soc 301.
§ At least three of the following courses must be completed: Ag Ec 351, Ag Ec 352, Ag Ec 456, Ag Ec 460, Econ 302, Econ 312, IM 302, IM 307.

#### Production Technology Option

#### Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 220 Elem. Org. Chem.</td>
<td>4</td>
</tr>
<tr>
<td>Dy Sc 201 Introd. Dairying</td>
<td>3</td>
</tr>
<tr>
<td>Econ 201 Principles of Econ.</td>
<td>3</td>
</tr>
<tr>
<td>Engl 205 Survey of Engl. Lit.</td>
<td>3</td>
</tr>
<tr>
<td>Phys 201 Gen. Physics</td>
<td>3</td>
</tr>
<tr>
<td>Phys 203 Gen. Physics Lab.</td>
<td>1</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1</td>
</tr>
</tbody>
</table>

18

#### Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Ec 202 Agric. Economics</td>
<td>3</td>
</tr>
<tr>
<td>Agron 202 Farm Management</td>
<td>3</td>
</tr>
<tr>
<td>Agron 202 Soils</td>
<td>3</td>
</tr>
<tr>
<td>Agron 306 Forage &amp; Pasture Crops</td>
<td>3</td>
</tr>
<tr>
<td>Engl 204 Survey of Engl. and Amer. Lit.</td>
<td>3</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1</td>
</tr>
</tbody>
</table>

19

* Taught only in academic years ending with odd number (example 1964-1965).
† Dy Sc 402 may be substituted for Dy Sc 453 and 455. Dy Sc 402 will be taught in second semester of academic years ending in even number (example 1965-1966).
‡ To be selected from the following courses: Geog 301, Geog 302, Hist 301, Psych 301, RS 301, Soc 301.
### Entomology

Entomology is a branch of science that deals with the study of insects. In many ways insects are the most important group of animals that affect man. At the present time insects are costing the American public approximately four billion dollars annually. There will always be a need for qualified entomologists and the financial rewards to members of this profession are comparable to those enjoyed by most other scientists.

Two options are available in the Entomology curriculum—Science and Business. Depending on training, ability, and interest, entomologists find employment in such areas as the following: (1) research entomologists with several federal agencies, the state experiment stations, or private research foundations; (2) teaching entomology and/or zoology at the college or university level; (3) industrial research and the development of more efficient insecticides; (4) quarantine and regulatory work at both state and federal levels; (5) sales and management for agricultural chemical or the pest control industries; (6) the federal and state extension services; (7) many other specialized areas where a knowledge of insects is essential, such as beekeeping or disease transmission.

<table>
<thead>
<tr>
<th>JUNIOR YEAR</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td><strong>Second Semester</strong></td>
</tr>
<tr>
<td>Bact 301 Gen. Bacteriology</td>
<td>An Sc 301 Feeds and Feeding</td>
</tr>
<tr>
<td>Dy Sc 307 Market Milk*</td>
<td>Dy Sc 306 Ch. &amp; Phys. Nat. of Milk</td>
</tr>
<tr>
<td>Engl 301 Public Speaking</td>
<td>Dy Sc 310 Dairy Cattle Selection.</td>
</tr>
<tr>
<td>Social Science Elective†</td>
<td>Gen 302 Genetics</td>
</tr>
<tr>
<td></td>
<td>Approved Elective</td>
</tr>
<tr>
<td>19</td>
<td>17</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SENIOR YEAR</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td><strong>Second Semester</strong></td>
</tr>
<tr>
<td>Bact 402 Dairy Bacteriology</td>
<td>An Sc 452 Animal Breeding</td>
</tr>
<tr>
<td>Dy Sc 403 Animal Nutrition</td>
<td>or Dy Sc 404 Dairy Plant Mgt.*</td>
</tr>
<tr>
<td>Dy Sc 409 Dairy Seminar</td>
<td>Dy Sc 410 Dairy Seminar</td>
</tr>
<tr>
<td>Dy Sc 453 Animal Reprod.†</td>
<td>Dy Sc 452 Dairy Cattle Feed.</td>
</tr>
<tr>
<td>Dy Sc 455 Animal Reprod. Lab.†</td>
<td>&amp; Mgt.</td>
</tr>
<tr>
<td>Approved Elective</td>
<td>Approved Elective</td>
</tr>
<tr>
<td>18</td>
<td>17</td>
</tr>
</tbody>
</table>

* Taught only in academic years ending with odd number (example 1964-1965).
† Dy Sc 402 may be substituted for Dy Sc 453 and 455. Dy Sc 402 will be taught in second semester of academic years ending in even number (example 1965-1966).
‡ To be selected from the following courses: Geog 301, Geog 302, Hist 301, Psych 301, R S 301, Soc 301.
### ENTOMOLOGY CURRICULUM

(See page 116 for Freshman Year)

#### SCIENCE OPTION

**Sophomore Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phys 201 Gen. Physics</td>
<td>Ent 301 Elem. and Econ. Ent.</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>Phys 204 Gen. Physics Lab.</td>
</tr>
<tr>
<td><strong>16</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Junior Year</th>
<th>Senior Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bact 301 Gen. Bacteriology</td>
<td>Bot 352 Plant Physiology</td>
</tr>
<tr>
<td>Ch 316 Quan. Anal.</td>
<td>Ent 306 Econ. Entomology*</td>
</tr>
<tr>
<td>Ent 305 Econ. Entomology*</td>
<td>Gen 302 Genetics</td>
</tr>
<tr>
<td>Approved Electives§</td>
<td><strong>19</strong></td>
</tr>
<tr>
<td><strong>19</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

* To be taught in 1965-1966 and alternate years thereafter.
† To be taught in 1966-1967 and alternate years thereafter.
§ At least three of the following courses must be completed: Ag Ec 351, Ag Ec 352, Ag Ec 456, Ag Ec 460, Econ 302, Econ 312, IM 302, IM 307.

#### BUSINESS OPTION

**Sophomore Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agron 202 Soils</td>
<td>Acct 201 Prin. of Accounting</td>
</tr>
<tr>
<td>Ch 220 Elem. Org. Chem.</td>
<td>Ag Ec 202 Agric. Economics</td>
</tr>
<tr>
<td>Econ 201 Principles of Econ.</td>
<td>Engl 204 Survey of Engl. and Amer. Lit.</td>
</tr>
<tr>
<td>IM 201 Intro. to Ind. Mgt.</td>
<td>Phys 201 Gen. Physics</td>
</tr>
<tr>
<td>IM or MS—Basic</td>
<td>Phys 203 Gen. Physics Lab.</td>
</tr>
<tr>
<td><strong>17</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Junior Year</th>
<th>Senior Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Ec 309 Intro. to Marketing</td>
<td>Bot 301 Gen. Bacteriology</td>
</tr>
<tr>
<td>Ag Ec 351 Advertising and Merch.</td>
<td>Engl 301 Public Speaking</td>
</tr>
<tr>
<td>Ent 305 Econ. Entomology*</td>
<td>Ent 306 Econ. Entomology*</td>
</tr>
<tr>
<td>Approved Electives</td>
<td><strong>19</strong></td>
</tr>
<tr>
<td><strong>19</strong></td>
<td><strong>19</strong></td>
</tr>
</tbody>
</table>

* To be taught in 1965-1966 and alternate years thereafter.
† To be taught in 1966-1967 and alternate years thereafter.
§ To be selected from the following courses: Geog 301, Geog 302, Hist 301, Psych 301, RS 301, Soc 301.
HORTICULTURE (Fruit and Vegetable)

This curriculum provides the student with a basic education in science and the humanities, and the application of both in the scientific, technical, and business phases of the fruit and vegetable industry.

Opportunities in this field of study include vegetable and fruit farm management; inspection of fresh fruit, vegetable and other food products as well as nursery stock. There are many other opportunities as in plant breeding, agricultural extension service work, horticultural research, horticultural teaching and writing, and fruit and vegetable processing. Other occupations include sales and field work with seedsmen and nurserymen, and manufacturers of food fertilizer, and pesticide products.

Students majoring in the fruit and vegetable phase of Horticulture may choose from the Science, Business, or Production Technology options.

HORTICULTURE (FRUIT AND VEGETABLE) CURRICULUM
(See page 116 for Freshman Year)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SCIENCE OPTION</strong></td>
<td><strong>Sophomore Year</strong></td>
</tr>
<tr>
<td>Agron 202 Soils</td>
<td>Ch 316 Quan. Analysis</td>
</tr>
<tr>
<td>Ch 323 Org. Chem.</td>
<td>or Ch 324 Org. Chem.</td>
</tr>
<tr>
<td>Phys 201 Gen. Physics</td>
<td>Hort 201 Gen. Horticulture</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>Phys 204 Gen. Physics Lab.</td>
</tr>
<tr>
<td><strong>19</strong></td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td><strong>19 or 18</strong></td>
<td><strong>19 or 19</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>JUNIOR YEAR</strong></th>
<th><strong>SENIOR YEAR</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bact 301 Gen. Bacteriology</td>
<td>Bot 352 Plant Physiology</td>
</tr>
<tr>
<td>Eng 301 Public Speaking</td>
<td>Ent 301 Elem. and Econ. Ent.</td>
</tr>
<tr>
<td>Hort 302 Prin. Veg. Prod.</td>
<td>Gen 302 Genetics</td>
</tr>
<tr>
<td>Hort 352 Commercial Pomology</td>
<td>Social Science Elective*</td>
</tr>
<tr>
<td>Approved Elective</td>
<td>Approved Elective</td>
</tr>
<tr>
<td><strong>19</strong></td>
<td>Approved Elective</td>
</tr>
<tr>
<td><strong>18 or 19</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SENIOR YEAR</strong></th>
<th><strong>16</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bot 401 Plant Pathology</td>
<td>Agron 405 Plant Breeding</td>
</tr>
<tr>
<td>Ex St 401 Intro. Statistics</td>
<td>Hort 410 Seminar</td>
</tr>
<tr>
<td>Hort 407 Landscape Design</td>
<td>Hort 468 Intro. to Research</td>
</tr>
<tr>
<td>Hort 409 Seminar</td>
<td>Approved Elective</td>
</tr>
<tr>
<td>Hort 464 Food Preservation</td>
<td><strong>10</strong></td>
</tr>
<tr>
<td>Approved Elective</td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

* To be selected from the following courses: Geog 301, Geog 302, Hist 301, Psych 301, RS 301, Soc 301.
### BUSINESS OPTION

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Sophomore Year</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agron 202 Soils</td>
<td>Acct 201 Prin. of Accounting</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Ch 220 Elem. Org. Chem.</td>
<td>Ch 220 Agric. Economics</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Econ 201 Principles of Econ.</td>
<td>Econ 204 Survey of Engl. and Amer. Lit.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>IM 201 Introd. to Ind. Mgt.</td>
<td>Phys 201 Gen. Physics</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>Phys 203 Gen. Physics Lab.</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td></td>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17</td>
</tr>
</tbody>
</table>

#### JUNIOR YEAR

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Ec 351 Advertising and Merch.</td>
<td>Ag Ec 309 Introd. to Marketing</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Bact 301 Gen. Bacteriology</td>
<td>Bot 352 Plant Physiology</td>
<td>4 (3,3)</td>
</tr>
<tr>
<td>Engl 301 Public Speaking</td>
<td>Gen 302 Genetics</td>
<td>3 (2,3)</td>
</tr>
<tr>
<td>Hort 302 Prin. Veg. Prod.</td>
<td>Gov 301 Am. Gov. and Pol. Par.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Hort 305 Plant Propagation</td>
<td>Ent 301 Elem. and Econ. Ent.</td>
<td>3 (2,3)</td>
</tr>
<tr>
<td>Hort 352 Commercial Pomology</td>
<td>Social Science Elective*</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19</td>
</tr>
</tbody>
</table>

#### SENIOR YEAR

| Hort 407 Landscape Design | Bot 401 Plant Pathology | 3 (2,3) |
| Hort 409 Seminar | Hort 410 Seminar | 1 (1,0) |
| Hort 464 Food Preservation | Approved Electives† | 14 |
| | | 18 |

*To be selected from the following courses: Geog 301, Geog 302, Hist 301, Psych 301, RS 301, Soc 301.
†At least two of the following courses must be selected: Ag Ec 352, Ag Ec 456, Ag Ec 460, Econ 302, Econ 312, IM 302, IM 307.

### PRODUCTION TECHNOLOGY OPTION

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Sophomore Year</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agron 202 Soils</td>
<td>Ag Ec 202 Agric. Economics</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Ch 220 Elem. Org. Chem.</td>
<td>AgE 206 Agric. Mechanization</td>
<td>3 (2,3)</td>
</tr>
<tr>
<td>Econ 201 Principles of Econ.</td>
<td>Engl 204 Survey of Engl. and Amer. Lit.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Engl 203 Survey of Engl. Lit.</td>
<td>Ent 301 Elem. and Econ. Ent.</td>
<td>3 (2,3)</td>
</tr>
<tr>
<td>Hort 201 Gen. Horticulture</td>
<td>Phys 201 Gen. Physics</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Hort 303 Plant Materials I</td>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
</tr>
<tr>
<td>Hort 305 Plant Propagation</td>
<td></td>
<td>17</td>
</tr>
<tr>
<td>Hort 352 Commercial Pomology</td>
<td></td>
<td>19</td>
</tr>
</tbody>
</table>

#### JUNIOR YEAR

| Bact 301 Gen. Bacteriology | Ag Ec 302 Farm Management | 3 (2,3) |
| Engl 301 Public Speaking | Bot 352 Plant Physiology | 4 (3,3) |
| Hort 302 Prin. Veg. Prod. | Gen 302 Genetics | 3 (2,3) |
| Hort 303 Plant Materials I | Gov 301 Am. Gov. and Pol. Par. | 3 (3,0) |
| Hort 305 Plant Propagation | Social Science Elective* | 3 |
| Hort 352 Commercial Pomology | Approved Elective | 3 |
| | | 19 |

#### SENIOR YEAR

| Bot 401 Plant Pathology | Agron 405 Plant Breeding | 3 (2,3) |
| Hort 409 Seminar | Hort 308 Landscape Design | 3 (2,3) |
| Hort 464 Food Preservation | Hort 410 Seminar | 1 (1,0) |
| | Hort 451 Small Fruit Culture | 3 (2,3) |
| | Hort 456 Truck Crops | 3 (2,3) |
| | Approved Electives | 5 |
| | | 18 |

*To be selected from the following courses: Geog 301, Geog 302, Hist 301, Psych 301, RS 301, Soc 301.

### HORTICULTURE (Ornamental)

This curriculum is designed to give students a scientific background and technical facilities in the field of Ornamental Horticult-
ture. Subject matter covers plant materials culture, uses, and planning of ground spaces.

Graduates find careers in nursery work, floriculture, landscape designing, landscape contracting, turf management, and park supervision. Other occupations are as research personnel, teachers, extension workers, and as representatives of fertilizer, machinery, and chemical companies.

Students desiring to major in Ornamental Horticulture may choose from the Science, Business, or Production Technology options.

## HORTICULTURE (ORNAMENTAL) CURRICULUM

*(See page 116 for Freshman Year)*

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SCIENCE OPTION</strong></td>
<td><strong>Second Semester</strong></td>
</tr>
<tr>
<td><strong>SOPHOMORE YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>Agron 202 Soils</td>
<td>Ch 316 Quan. Analysis</td>
</tr>
<tr>
<td>Ch 323 Org. Chem.</td>
<td>or Ch 324 Org. Chem.</td>
</tr>
<tr>
<td>Ch 327 Org. Chem. Lab.</td>
<td>and Ch 328 Org. Chem. Lab.</td>
</tr>
<tr>
<td>Engl 203 Survey of Eng. Lit.</td>
<td>Econ 201 Principles of Econ.</td>
</tr>
<tr>
<td>Phys 201 Gen. Physics</td>
<td>Amer. Lit.</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>Phys 202 Gen. Phys.</td>
</tr>
<tr>
<td></td>
<td>Phys 204 Gen. Physics Lab.</td>
</tr>
<tr>
<td></td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>JUNIOR YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>Bact 301 Gen. Bacteriology</td>
<td>Bot 352 Plant Physiology</td>
</tr>
<tr>
<td>Gen 302 Genetics</td>
<td>Engl 301 Public Speaking</td>
</tr>
<tr>
<td>Gov 301 Am. Gov. and Pol. Par.</td>
<td>Ent 301 Elem. and Econ. Ent.</td>
</tr>
<tr>
<td>Hort 302 Prin. Veg. Prod.</td>
<td>Hort 304 Plant Materials II</td>
</tr>
<tr>
<td>Hort 303 Plant Materials I</td>
<td>Hort 308 Landscape Design</td>
</tr>
<tr>
<td>Hort 305 Plant Propagation</td>
<td>Hort 310 Floriculture</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SENIOR YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>Bot 401 Plant Pathology</td>
<td>Bot 356 Taxonomy</td>
</tr>
<tr>
<td>Hort 352 Commercial Pomology</td>
<td>Ex St 401 Introd. Statistics</td>
</tr>
<tr>
<td>Hort 409 Seminar</td>
<td>Hort 410 Seminar</td>
</tr>
<tr>
<td>Approved Electives</td>
<td>Hort 468 Intro. to Research</td>
</tr>
<tr>
<td></td>
<td>Social Science Elective*</td>
</tr>
<tr>
<td></td>
<td>Approved Electives</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*To be selected from the following courses: Geog 301, Geog 302, Hist 301, Psych 301, RS 301, Soc 301.

## BUSINESS OPTION

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SOPHOMORE YEAR</strong></td>
<td></td>
</tr>
<tr>
<td>Agron 202 Soils</td>
<td>Ag Ec 202 Agri. Economics</td>
</tr>
<tr>
<td>Ch 220 Elem. Org. Chem.</td>
<td>Acct 201 Prin. of Accounting</td>
</tr>
<tr>
<td>Econ 201 Principles of Econ.</td>
<td>Engl 204 Survey of Engl. and</td>
</tr>
<tr>
<td>Engl 203 Survey of Eng. Lit.</td>
<td>Amer. Lit.</td>
</tr>
<tr>
<td>IM 201 Introd. to Ind. Mgt.</td>
<td>Hort 201 Gen. Horticulture</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>Phys 201 Gen. Physics</td>
</tr>
<tr>
<td></td>
<td>Phys 203 Gen. Physics Lab.</td>
</tr>
<tr>
<td></td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
POULTRY SCIENCE

The Poultry Science curriculum is designed to provide sound training in the basic disciplines within which the poultry industry operates. Technical poultry courses emphasize the application of basic principles to production, processing and marketing of poultry products.

Required courses in other departments and schools plus electives selected in areas of the student's personal interest provide a broad educational program designed to equip the graduate for his total life work.
Graduates of the Poultry Science curriculum find employment as sales and servicemen with feed, drug and equipment manufacturers, extension agents and specialists, hatchery managers and poultry farm operators. The increased use of the chick as an experimental animal provides positions for graduates as researchers with pharmaceutical houses, chemical manufacturers, private laboratories, government research organizations, colleges and experiment stations. A strong research program conducted by the department provides opportunity for student participation in this challenging area. Many research and technical positions require training at the graduate level.

The growing size and increasing complexity of poultry industry organization has created a need for Poultry Science majors with training in business and communications.

A student may elect the Science, Business or Production Technology option.

**Poultry Science Curriculum**

(See page 116 for Freshman Year)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS 201 Introd. to Poultry Sc.</td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>19</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Junior Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>An Sc 301 Feeds and Feeding</td>
</tr>
<tr>
<td>or Math 205 Anal. Geom., Cal. II</td>
</tr>
<tr>
<td>PS 355 Poultry Grad. &amp; Proc.*</td>
</tr>
<tr>
<td>Zool 307 Animal Anat. &amp; Physiol.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>18 or 17</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Senior Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bact 401 Adv. Bacteriology</td>
</tr>
<tr>
<td>or Ent 301 Elem. and Econ. Ent.</td>
</tr>
<tr>
<td>or Ent 455 Med. &amp; Vet. Ent.</td>
</tr>
<tr>
<td>or Zool 301 Compar. Vert. Anat.</td>
</tr>
<tr>
<td>or Zool 405 Animal Histology</td>
</tr>
<tr>
<td>Dy Sc 403 Animal Nutrition</td>
</tr>
<tr>
<td>PS 401 Poultry Environ. Tech.†</td>
</tr>
<tr>
<td>PS 451 Poultry Nutrition†</td>
</tr>
<tr>
<td>Approved Elective</td>
</tr>
<tr>
<td>19 or 18</td>
</tr>
</tbody>
</table>

* To be taught in 1965-1966 and alternate years thereafter.
† To be taught in 1966-1967 and alternate years thereafter.
‡ To be selected from the following courses: Geog 301, Geog 302, Hist 301, Psych 301, RS 301, Soc 301.
§ Two semesters of same language selected from French, German, Russian, or Spanish.
## Degrees and Curriculums

### BUSINESS OPTION

#### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 220 Elem. Org. Chem.</td>
<td>(3,3)</td>
</tr>
<tr>
<td>Econ 201 Principles of Econ.</td>
<td>(3,0)</td>
</tr>
<tr>
<td>Engl 203 Survey of Engl. Lit.</td>
<td>(3,0)</td>
</tr>
<tr>
<td>IM 301 Intro. to Indus. Mgt.</td>
<td>(3,0)</td>
</tr>
<tr>
<td>PS 201 Intro. to Poultry Sci.</td>
<td>(2,3)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>(1,2,1)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

#### Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acct 201 Prin. of Accounting</td>
<td>(3,0)</td>
</tr>
<tr>
<td>Ag Ec 202 Agric. Economics</td>
<td>(3,0)</td>
</tr>
<tr>
<td>Agron 202 Soils</td>
<td>(3,0)</td>
</tr>
<tr>
<td>An Sc 301 Feeds and Feeding</td>
<td>(3,0)</td>
</tr>
<tr>
<td>Engl 204 Survey of Engl. and Amer. Lit.</td>
<td>(3,0)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>20</strong></td>
</tr>
</tbody>
</table>

#### Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Ec 309 Intro. to Marketing</td>
<td>(3,0)</td>
</tr>
<tr>
<td>Bact 301 Gen. Bacteriology</td>
<td>(4,3)</td>
</tr>
<tr>
<td>Dy Sc 201 Intro. Dairying</td>
<td>(3,0)</td>
</tr>
<tr>
<td>Engl 301 Public Speaking</td>
<td>(3,0)</td>
</tr>
<tr>
<td>Gen 302 Genetics</td>
<td>(2,3)</td>
</tr>
<tr>
<td>PS 355 Poultry Grad. &amp; Proc.*</td>
<td>(3,0)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>19</strong></td>
</tr>
</tbody>
</table>

#### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Ec 351 Advertising and Merch.</td>
<td>(3,0)</td>
</tr>
<tr>
<td>PS 401 Poultry Environ. Tech.†</td>
<td>(3,0)</td>
</tr>
<tr>
<td>PS 451 Poultry Nutrition†</td>
<td>(3,0)</td>
</tr>
<tr>
<td>Approved Electives</td>
<td>(8 or 9)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

* To be taught in 1965-1966 and alternate years thereafter.
† To be selected from the following courses: Geog 301, Geog 302, Hist 301, Psych 301, RS 301, Soc 301.

### PRODUCTION TECHNOLOGY OPTION

#### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agron 202 Soils</td>
<td>(2,3)</td>
</tr>
<tr>
<td>Ch 220 Elem. Org. Chem.</td>
<td>(3,3)</td>
</tr>
<tr>
<td>Econ 201 Principles of Econ.</td>
<td>(3,0)</td>
</tr>
<tr>
<td>Engl 203 Survey of Engl. Lit.</td>
<td>(3,0)</td>
</tr>
<tr>
<td>PS 201 Intro. to Poultry Sci.</td>
<td>(2,3)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>(1,2,1)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

#### Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agron 202 Agric. Economics</td>
<td>(3,0)</td>
</tr>
<tr>
<td>AgE 206 Agric. Mechanization</td>
<td>(3,0)</td>
</tr>
<tr>
<td>Dy Sc 201 Intro. Dairying</td>
<td>(3,0)</td>
</tr>
<tr>
<td>Engl 204 Survey of Engl. and Amer. Lit.</td>
<td>(3,0)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

#### Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>An Sc 301 Feeds and Feeding</td>
<td>(3,0)</td>
</tr>
<tr>
<td>Bact 301 Gen. Bacteriology</td>
<td>(4,3)</td>
</tr>
<tr>
<td>Engl 301 Public Speaking</td>
<td>(3,0)</td>
</tr>
<tr>
<td>Gen 302 Genetics</td>
<td>(2,3)</td>
</tr>
<tr>
<td>PS 355 Poultry Grad. &amp; Proc.*</td>
<td>(3,0)</td>
</tr>
<tr>
<td>Zool 307 Animal Anat. &amp; Physiol.</td>
<td>(2,3)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>19</strong></td>
</tr>
</tbody>
</table>

#### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS 401 Poultry Environ. Tech.†</td>
<td>(3,0)</td>
</tr>
<tr>
<td>PS 451 Poultry Nutrition†</td>
<td>(3,0)</td>
</tr>
<tr>
<td>Approved Electives</td>
<td>(14)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td><strong>20</strong></td>
</tr>
</tbody>
</table>

* To be taught in 1965-1966 and alternate years thereafter.
† To be selected from the following courses: Geog 301, Geog 302, Hist 301, Psych 301, RS 301, Soc 301.
AGRICULTURAL ENGINEERING

The Agricultural Engineering curriculum is jointly administered by the College of Agriculture and Biological Sciences and the College of Engineering.

Agricultural Engineering deals fundamentally with the application of the engineering sciences to progress in agriculture. Agricultural engineers provide engineering services in the areas of power and machinery, soil and water conservation engineering, farm electrification, agricultural structures, and processing engineering.

The curriculum of Agricultural Engineering leads to the degree of Bachelor of Science in Agricultural Engineering. It is based on the study of fundamentals of mathematics, physics, chemistry, and biology. The engineering sciences of mechanics, fluids, thermodynamics, and electrical theory, together with the basic agricultural sciences of soils, plants and animals, provide the foundation for the Agricultural Engineering design and analysis. Courses in the humanities are included to provide the student with a well-rounded educational program. Graduate courses are offered leading to advanced degrees.

Opportunities in Agricultural Engineering include employment with industry as design engineers, research engineers, production engineers, and in sales and service; with state and federal agencies as teachers, research engineers, and extension engineers; as field engineers with soil conservation service, bureau of reclamation, etc.; with agricultural enterprises as managers, contractors, equipment retailers and consulting engineers. The Agricultural Engineering curriculum is accredited by the Engineers’ Council for Professional Development.

**AGRICULTURAL ENGINEERING CURRICULUM**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Freshman Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 101 General Chemistry</td>
<td>AgBio 101 Introd. Agr. &amp; Biol. Sci.</td>
</tr>
<tr>
<td>Engr 101 Engineering Systems</td>
<td>Ch 102 General Chemistry</td>
</tr>
<tr>
<td>EG 109 Engr. Com. &amp; Design</td>
<td>Engl 102 English Composition</td>
</tr>
<tr>
<td>or Hist 104 Western Civilization</td>
<td>Hist 104 Western Civilization</td>
</tr>
<tr>
<td>Engl 101 English Composition</td>
<td>or EG 109 Engr. Com. &amp; Design</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>Phys 122 Mech. &amp; Wave Phenom.</td>
</tr>
<tr>
<td></td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td><strong>15</strong></td>
<td><strong>19</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Sophomore Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>AgE 209 Ag. Eng. Technology</td>
<td>AgE 299 Digital Computation</td>
</tr>
<tr>
<td>EM 201 Statics</td>
<td>Bot 101 General Botany</td>
</tr>
<tr>
<td>Engl 203 Surv. of Engl. Lit.</td>
<td>EM 202 Dynamics</td>
</tr>
<tr>
<td>Phys 221 Ther. &amp; Elec. Phen.</td>
<td>Phys 222 Opt. &amp; Mod. Phys.</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td><strong>19</strong></td>
<td><strong>20</strong></td>
</tr>
</tbody>
</table>
## BIOLOGY

The Biology curriculum is designed to give the student fundamental training in the Biological Sciences. It is arranged to give him a broad background in the biological, physical, and social sciences and then in the junior and senior years to permit him to select an option for further study either in Botany or Zoology. The number of available elective credits is sufficient to permit a student to take work in related fields of basic science or in the various areas of applied Biology.

The Biology curriculum is designed to train students for employment as applied biologists in sales, service, or research in industry or government service. It is also suitable as a base for those students who desire to take further work at the graduate level and thus prepare themselves to teach or conduct independent research in the basic or applied biological sciences.

### BIOLOGY CURRICULUM

#### FIRST SEMESTER

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AgE 355 Engr. Anal. &amp; Creat.</td>
<td>3</td>
</tr>
<tr>
<td>Agron 202 Soils</td>
<td>3</td>
</tr>
<tr>
<td>EE 307 Basic Elec. Engr.</td>
<td>3</td>
</tr>
<tr>
<td>EE 309 Elec. Engr. Lab.</td>
<td>1</td>
</tr>
<tr>
<td>EM 304 Mechanics of Materials</td>
<td>3</td>
</tr>
<tr>
<td>Math 309 Engr. Math. II</td>
<td>3</td>
</tr>
<tr>
<td>ME 311 Engr. Thermo. I</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>19</strong></td>
</tr>
</tbody>
</table>

#### SECOND SEMESTER

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AgE 362 Energy Conv. in Ag. Sys.</td>
<td>3</td>
</tr>
<tr>
<td>Bot 352 Plant Physiology</td>
<td>4</td>
</tr>
<tr>
<td>EE 308 Basic Elec. Engr.</td>
<td>3</td>
</tr>
<tr>
<td>EE 310 Elec. Engr. Lab.</td>
<td>1</td>
</tr>
<tr>
<td>EM 320 Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>Zool 101 General Zoology</td>
<td>3</td>
</tr>
<tr>
<td>Zool 103 General Zoology Lab.</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

#### JUNIOR YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AgE 451 Ag. Struct. Design</td>
<td>3</td>
</tr>
<tr>
<td>AgE 465 Engr. Prop. of Biol. Mat.</td>
<td>3</td>
</tr>
<tr>
<td>AgE 471 Research</td>
<td>1</td>
</tr>
<tr>
<td>CrE 310 Intro. to Mat. Science</td>
<td>3</td>
</tr>
<tr>
<td>or ME 304 Heat Transfer I</td>
<td>3</td>
</tr>
<tr>
<td>CE 200 Elem. Surveying</td>
<td>2</td>
</tr>
<tr>
<td>Econ 201 Prin. of Economics</td>
<td>3</td>
</tr>
<tr>
<td>Approved Elective</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

#### SENIOR YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AgE 416 Agric. Machinery</td>
<td>3</td>
</tr>
<tr>
<td>AgE 422 Soil &amp; Water Con. Engr.</td>
<td>4</td>
</tr>
<tr>
<td>AgE 442 Agric. Proc. Engr.</td>
<td>3</td>
</tr>
<tr>
<td>Gov 301 Amer. Gov. and Pol. Par.</td>
<td>3</td>
</tr>
<tr>
<td>Approved Elective</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

### FRESHMAN YEAR

#### FIRST SEMESTER

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bot 101 Gen. Botany</td>
<td>4</td>
</tr>
<tr>
<td>Ch 101 General Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>EG 101 Freehand Sketching</td>
<td>1</td>
</tr>
<tr>
<td>Engl 101 English Composition</td>
<td>3</td>
</tr>
<tr>
<td>Math 105 Alg. &amp; Trig.</td>
<td>4</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

#### SECOND SEMESTER

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AgBio 101 Introd. Agr. &amp; Biol. Sci.</td>
<td>1</td>
</tr>
<tr>
<td>Ch 102 General Chemistry</td>
<td>4</td>
</tr>
<tr>
<td>Engl 102 English Composition</td>
<td>3</td>
</tr>
<tr>
<td>Math 106 Anal. Geom., Cal. I</td>
<td>4</td>
</tr>
<tr>
<td>Zool 101 Gen. Zoology</td>
<td>3</td>
</tr>
<tr>
<td>Zool 103 Gen. Zoology Lab.</td>
<td>1</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

### SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 201 Principles of Econ.</td>
<td>3</td>
</tr>
<tr>
<td>Engl 203 Survey of Engl. Lit.</td>
<td>3</td>
</tr>
<tr>
<td>Phys 201 Gen. Physics</td>
<td>3</td>
</tr>
<tr>
<td>Phys 203 Gen. Physics Lab.</td>
<td>1</td>
</tr>
<tr>
<td>Zool 301 Vertebrate Anatomy</td>
<td>3</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1</td>
</tr>
<tr>
<td>Approved Elective</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

*To be selected from the following courses: AgE 202, Econ 202, Gov 101, Hist 104, Rel 301, Rel 302.*
BOTANY OPTION

First Semester | Second Semester
--- | ---
Bot 301 Gen. Bacteriology | Chemistry Elective* 4 or 5
Bot 352 Plant Physiology | Gen 302 Genetics 3 (2,3)
Engl 301 Public Speaking | Approved Electives† 12 or 11
Chemistry Elective* | 4 or 5
Approved Electives† | 19

ZOOLOGY OPTION

First Semester | Second Semester
--- | ---
Ch 327 Org. Chem. Lab. | Zool 302 Vertebrate Embryology 3 (2,3)
Ent 301 Elem. & Econ. Ent. | Chemistry Elective† 4 or 5
Zool 307 Animal Anat. & Phys. | Social Science Elective† 3
Approved Electives* | Approved Electives* 5 or 4

FOOD SCIENCE

The food processing industry is the nation’s largest industry. Since it is also a growing industry which requires scientists in increasing numbers, many excellent opportunities are available to food scientists.

The curriculum in Food Science provides an excellent education designed to prepare graduates for occupations in the food industry, research positions in government organizations and state experiment stations, food inspection and grading work with state and federal agencies, teaching, extension and consulting opportunities.

The student may choose either the Science or the Business option. The Science option provides an excellent basis for graduate study as well as employment. The Business option will be of particular interest to the student who wishes to combine technical and busi-
ness courses with a view toward management positions in the food industry.

### FOOD SCIENCE CURRICULUM

#### Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 101 Gen. Chemistry</td>
<td>Ch 102 General Chemistry</td>
</tr>
<tr>
<td>Engl 101 English Composition</td>
<td>Engl 102 English Composition</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>Zool 101 Gen. Zoology</td>
</tr>
<tr>
<td><strong>16</strong></td>
<td>AS or MS—Basic</td>
</tr>
</tbody>
</table>

#### Second Semester

<table>
<thead>
<tr>
<th><strong>First Semester</strong></th>
<th><strong>Second Semester</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 323 Org. Chem.</td>
<td>Ch 312 Anal. Chemistry</td>
</tr>
<tr>
<td>Econ 201 Principles of Econ.</td>
<td>Ch 324 Org. Chemistry</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>Phys 204 Gen. Phys. Lab.</td>
</tr>
<tr>
<td><strong>16</strong></td>
<td>AS or MS—Basic</td>
</tr>
</tbody>
</table>

#### Junior Year

<table>
<thead>
<tr>
<th><strong>First Semester</strong></th>
<th><strong>Second Semester</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bact 301 Gen. Bacteriology</td>
<td>Bact 312 Food Microbiology</td>
</tr>
<tr>
<td>Ch 339 Physical Chem. Lab.</td>
<td>FdSc 304 Food Processing</td>
</tr>
<tr>
<td>Ex St 401 Introd. Statistics</td>
<td>Approved Electives†</td>
</tr>
<tr>
<td>FdSc 401 Elem. of Food Sci.</td>
<td><strong>18</strong></td>
</tr>
<tr>
<td>FdSc 405 Food Analysis†</td>
<td></td>
</tr>
<tr>
<td>Approved Electives†</td>
<td></td>
</tr>
<tr>
<td><strong>20</strong></td>
<td></td>
</tr>
</tbody>
</table>

#### Senior Year

<table>
<thead>
<tr>
<th><strong>First Semester</strong></th>
<th><strong>Second Semester</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 423 Gen. Biochemistry</td>
<td>Engl 301 Public Speaking</td>
</tr>
<tr>
<td>Ch 425 Gen. Biochemistry Lab.</td>
<td>FdSc 404 Food Processing†</td>
</tr>
<tr>
<td>Ex St 401 Introd. Statistics</td>
<td>FdSc 406 Biochem. of Nutrition†</td>
</tr>
<tr>
<td>FdSc 405 Food Analysis†</td>
<td>Approved Electives†</td>
</tr>
<tr>
<td>Approved Electives†</td>
<td><strong>8</strong></td>
</tr>
<tr>
<td><strong>20</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Science Option

#### Sophomore Year

<table>
<thead>
<tr>
<th><strong>First Semester</strong></th>
<th><strong>Second Semester</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 220 Elem. Org. Chem.</td>
<td>Acct 201 Prin. of Accounting</td>
</tr>
<tr>
<td>Econ 201 Principles of Econ.</td>
<td>Ag Ec 202 Agric. Economics</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>IM 201 Introd. to Ind. Mgt.</td>
</tr>
<tr>
<td>Approved Electives†</td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td><strong>18</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

### Business Option

#### Sophomore Year

<table>
<thead>
<tr>
<th><strong>First Semester</strong></th>
<th><strong>Second Semester</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Ec 351 Advertising and Mdsg.</td>
<td>Ag Ec 309 Introd. to Marketing</td>
</tr>
<tr>
<td>Bact 301 Gen. Bacteriology</td>
<td>Bact 312 Food Microbiology</td>
</tr>
<tr>
<td>DySc 305 Dairy Tech. &amp; Engr.</td>
<td>Ch 310 Agric. Biochemistry</td>
</tr>
<tr>
<td>FdSc 301 Raw Food Mat. for Proc.²</td>
<td>FdSc 304 Food Processing</td>
</tr>
<tr>
<td>FdSc 303 Elem. of Food Sci.</td>
<td>Approved Electives†</td>
</tr>
<tr>
<td>Approved Electives†</td>
<td><strong>6</strong></td>
</tr>
<tr>
<td><strong>20</strong></td>
<td></td>
</tr>
</tbody>
</table>

#### Junior Year

<table>
<thead>
<tr>
<th><strong>First Semester</strong></th>
<th><strong>Second Semester</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Ec 351 Advertising and Mdsg.</td>
<td>Ag Ec 309 Introd. to Marketing</td>
</tr>
<tr>
<td>Bact 301 Gen. Bacteriology</td>
<td>Bact 312 Food Microbiology</td>
</tr>
<tr>
<td>DySc 305 Dairy Tech. &amp; Engr.</td>
<td>Ch 310 Agric. Biochemistry</td>
</tr>
<tr>
<td>FdSc 301 Raw Food Mat. for Proc.²</td>
<td>FdSc 304 Food Processing</td>
</tr>
<tr>
<td>FdSc 303 Elem. of Food Sci.</td>
<td>Approved Electives†</td>
</tr>
<tr>
<td>Approved Electives†</td>
<td><strong>19</strong></td>
</tr>
</tbody>
</table>
FORESTRY

The Clemson Forestry curriculum includes the fundamental and applied sciences needed in the scientific management of multiple-use forests. Foresters of professional standing are employed in various capacities by private concerns or by federal, state, and other public agencies. They may be engaged as managers and administrators of forest lands, technical specialists in extension, fire protection, recreation, or in other activities presupposing professional forestry knowledge. Foresters earning advanced degrees find employment in academic work and in research conducted both by public and private agencies.

FORESTRY CURRICULUM

### Freshman Year

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bot 101 Gen. Botany</td>
<td>4 (3,3)</td>
</tr>
<tr>
<td>Ch 101 Gen. Chemistry</td>
<td>4 (3,3)</td>
</tr>
<tr>
<td>Engl 203 Survey of Engl. Lit.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>For 201 Intro. to Forestry</td>
<td>1 (1,0)</td>
</tr>
<tr>
<td>For 203 Silvics</td>
<td>2 (2,0)</td>
</tr>
<tr>
<td>Geol 201 Physical Geol.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Phys 201 Gen. Physics</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Phys 203 Gen. Physics Lab.</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>16</td>
</tr>
</tbody>
</table>

**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AgBio 101 Introd. Agr. &amp; Biol. Sci.</td>
<td>1 (1,0)</td>
</tr>
<tr>
<td>Ch 102 General Chemistry</td>
<td>4 (3,3)</td>
</tr>
<tr>
<td>Engl 204 Survey of Engl. and Lit.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>For 202 Dendrology</td>
<td>4 (3,3)</td>
</tr>
<tr>
<td>Math 205 Anal. Geom., Cal. II</td>
<td>4 (4,0)</td>
</tr>
<tr>
<td>Phys 202 Gen. Physics</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Phys 204 Gen. Physics Lab.</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>19</td>
</tr>
</tbody>
</table>

### Sophomore Year

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>For 251 Silvics</td>
<td>3 (2,3)</td>
</tr>
<tr>
<td>For 252S Forest Engineering</td>
<td>2 cr.</td>
</tr>
<tr>
<td>For 253S Dendrometry</td>
<td>4 cr.</td>
</tr>
<tr>
<td>For 254S Forest Products</td>
<td>1 cr.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>19</td>
</tr>
</tbody>
</table>

**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bot 356 Taxonomy</td>
<td>3 (1,6)</td>
</tr>
<tr>
<td>CE 203 Topog. Surv. &amp; Map.</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>Engl 204 Survey of Engl. and Lit.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>For 202 Dendrology</td>
<td>4 (3,3)</td>
</tr>
<tr>
<td>Math 205 Anal. Geom., Cal. II</td>
<td>4 (4,0)</td>
</tr>
<tr>
<td>Phys 202 Gen. Physics</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Phys 204 Gen. Physics Lab.</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>20</td>
</tr>
</tbody>
</table>

### Forestry Summer Camp

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>For 251S Silvics</td>
<td>2 cr.</td>
</tr>
<tr>
<td>For 252S Forest Engineering</td>
<td>2 cr.</td>
</tr>
<tr>
<td>For 253S Dendrometry</td>
<td>4 cr.</td>
</tr>
<tr>
<td>For 254S Forest Products</td>
<td>1 cr.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>19</td>
</tr>
</tbody>
</table>

### Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 201 Principles of Econ.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Ent 307 Forest Entomology</td>
<td>3 (2,3)</td>
</tr>
<tr>
<td>Ex St 401 Intro. Statistics</td>
<td>3 (2,3)</td>
</tr>
<tr>
<td>For 301 Aeriel Forest Mapping</td>
<td>3 (2,3)</td>
</tr>
<tr>
<td>For 303 Silvicultare</td>
<td>4 (3,3)</td>
</tr>
<tr>
<td>Approved Elective*</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>17</td>
</tr>
</tbody>
</table>

* To be taught in 1965-1966 and alternate years thereafter.
† To be taught in 1966-1967 and alternate years thereafter.
At least three elective credits must be selected from the following courses: Hist 301, Psych 301, RS 301, Soc 301. Two of the following courses must be completed: Ag Ec 352, Ag Ec 456, Ag Ec 460, Econ 302, Econ 312, IM 302, IM 307.
PRE-VETERINARY MEDICINE

The curriculum in Pre-Veterinary Medicine is designed to meet the general requirements for admission to certain schools of veterinary medicine. Since the requirements for entrance to these schools are not uniform, the student in planning his program should consider the specific requirements of the school he expects to attend. Under the Southern Regional Educational Plan, ten qualified students from South Carolina may enter the School of Veterinary Medicine at the University of Georgia each year. The courses listed below are minimum requirements for all students applying under the Regional Education Board Contract. Only the exceptional student can expect to complete the minimum requirements in four semesters. Students in the entering classes in Schools of Veterinary Medicine now average in excess of three years of Pre-Veterinary training.

PRE-VETERINARY MEDICINE CURRICULUM

<table>
<thead>
<tr>
<th>Senior Year</th>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bot 405 Forest Pathology</td>
<td>3 (2,3)</td>
<td>Engl 301 Public Speaking</td>
</tr>
<tr>
<td>For 403 Forest Products</td>
<td>3 (2,3)</td>
<td>For 402 Logging and Milling</td>
</tr>
<tr>
<td>For 405 Forest Protection</td>
<td>2 (2,0)</td>
<td>For 404 Management Plans</td>
</tr>
<tr>
<td>For 407 Forest Regulation</td>
<td>4 (3,5)</td>
<td>For 406 For. Policy &amp; Admin.</td>
</tr>
<tr>
<td>Gov 301 Am. Gov. and Pol. Par.</td>
<td>3 (3,0)</td>
<td>For 408 Forest Valuation</td>
</tr>
<tr>
<td>Approved Elective*</td>
<td>3</td>
<td>Approved Elective*</td>
</tr>
</tbody>
</table>

18       16

* At least three credits must be selected from the following courses: Geog 301, Geog 302, Hist 301, Psych 301, RS 301, Soc 301.

SCHOOL OF ARCHITECTURE

The School of Architecture has as its prime objective well-rounded professional education for architectural practice and for training prospective building contractors. Secondarily, it prepares students for service in other areas of the building industry. Cultural courses in the visual arts are offered by the School to students in other disciplines. Two professional five-year curriculums are offered—the curriculum in Architecture, leading to the degree, Bachelor of Architecture, with basic options in Design and Structure; and that
in Building Construction, leading to the degree, Bachelor of Building Construction.

The development of man's physical environment is the field of the architect, embracing fundamental consideration of function, structure and beauty. The scope of professional problems in architecture may vary in scale and complexity from the design of furniture to complex buildings and urban planning. To best serve society in a rapidly changing era, the architect should retain a progressive attitude, and must understand and employ the aesthetic and technological tools at his disposal. Because of the nature of the profession, emphasis in all aspects of the School program is on creativity and maintaining standards of high quality. A broad background in the social sciences is necessary to the architect as a servant of humanity, as is a thorough training in the various disciplines of the profession which is at once an art and a science.

Architectural design is the core-course of the Architectural curriculum, engaging an increasing amount of the student's time as he advances, and enabling him to employ creatively the knowledge gained in the theory courses.

The curriculum in Architecture is accredited by the National Architectural Accrediting Board. The School of Architecture is a member of the Association of Collegiate Schools of Architecture.

The building industry is the largest in the country and there is a tremendous demand for qualified persons to translate the work of the architect into physical reality. This is the professional responsibility of the Building Contractor. The professional curriculum in Building Construction embraces the four necessary basic disciplines. One, an understanding of the humanities, to develop a whole man. Second, a comprehension of building in its several aspects. Third, a knowledge of the business and economic aspects of building construction, and fourth, an understanding of the relevant technical disciplines. The curriculum has been organized with the approval of the South Carolina Board of Architectural Examiners, the South Carolina Board of Engineering Examiners, and the South Carolina Contractors Licensing Board. It is endorsed by the Carolinas' Branch of the Association of General Contractors.

The physical facilities of the School of Architecture are excellent, being located in a newly constructed architectural building. Arranged around a courtyard and a large exhibition gallery, the School has flexible north-lighted studios for work in design and adjunct arts. Shops, offices, classrooms, and studios are carefully interrelated and well equipped. The architectural library adjoins the design
studios of the School and is regarded as a controlled working area. The collection includes books, periodicals, manuscripts, slides, films and other visual aids, and is strengthened annually from purchases by the central University Library and through gifts and bequests.

Each year the regular class offerings of the School of Architecture are supplemented by a series of lectures by outstanding specialists in various areas of architecture, and the adjunct arts and sciences. Such visits vary in length from two days to a month. The Architectural Gallery presents exhibits in architecture, painting, sculpture, and allied arts and crafts. The Clemson Architectural Foundation was established to assist in providing the lecture and exhibition programs, as well as field trips, scholarships, and other aids to the professional education of architects and contractors.

The School of Architecture reserves the right to require additional screening procedures in addition to those required of other applicants for admission.

**ARCHITECTURE CURRICULUM**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>First Year</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch 103 Environ. Tech. I</td>
<td>2 (1,3)</td>
<td>Arch 104 Environ. Tech. II</td>
</tr>
<tr>
<td>Arch 105 Visual Arts</td>
<td>2 (0,6)</td>
<td>Arch 106 Visual Arts</td>
</tr>
<tr>
<td>Arch 151 Basic Design</td>
<td>5 (1,12)</td>
<td>Arch 152 Basic Design</td>
</tr>
<tr>
<td>Engl 101 Engl. Composition</td>
<td>3 (3,0)</td>
<td>Engl 102 Engl. Composition</td>
</tr>
<tr>
<td>Math 105 Algebra and Trig.</td>
<td>4 (4,0)</td>
<td>Math 106 Anal Geom., Cal. I</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td><strong>17</strong></td>
<td></td>
<td><strong>17</strong></td>
</tr>
<tr>
<td>Arch 251 Arch. Design</td>
<td>6 (1,15)</td>
<td>Arch 252 Arch. Design</td>
</tr>
<tr>
<td>Engl 203 Survey of Engl. Lit.</td>
<td>3 (3,0)</td>
<td>Engl 204 Survey of Engl. and Amer. Lit.</td>
</tr>
<tr>
<td>Phys 201 Gen. Phys.</td>
<td>3 (3,0)</td>
<td>Phys 202 General Physics</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td><strong>17</strong></td>
<td></td>
<td><strong>17</strong></td>
</tr>
<tr>
<td>Arch 309 Arch. History I</td>
<td>2 (2,0)</td>
<td>Arch 310 Arch. History II</td>
</tr>
<tr>
<td>Arch 351 Arch. Design</td>
<td>7 (1,18)</td>
<td>Arch 352 Arch. Design</td>
</tr>
<tr>
<td>EM 201 Statics</td>
<td>3 (3,0)</td>
<td>EM 304 Mech. of Materials</td>
</tr>
<tr>
<td>Electives</td>
<td>6</td>
<td>Electives</td>
</tr>
<tr>
<td><strong>18</strong></td>
<td></td>
<td><strong>18</strong></td>
</tr>
<tr>
<td><strong>OPTION I</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Semester</td>
<td></td>
<td>Second Semester</td>
</tr>
<tr>
<td>Arch 413 Arch. History III</td>
<td>2 (2,0)</td>
<td>Arch 414 Arch. History IV</td>
</tr>
<tr>
<td>Arch 415 Structural Methods</td>
<td>2 (2,0)</td>
<td>Arch 452 Arch. Design</td>
</tr>
<tr>
<td>Arch 451 Arch. Design</td>
<td>8 (2,18)</td>
<td>Arch 476 Mechanical Plant</td>
</tr>
<tr>
<td>Arch 475 Mechanical Plant</td>
<td>2 (2,0)</td>
<td>CE 416 Structural Design</td>
</tr>
<tr>
<td>CE 308 Structural Analysis</td>
<td>4 (3,3)</td>
<td>Engl 301 Public Speaking</td>
</tr>
<tr>
<td><strong>18</strong></td>
<td></td>
<td><strong>19</strong></td>
</tr>
<tr>
<td><strong>FIFTH YEAR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arch 480 Office Practice</td>
<td>2 (2,0)</td>
<td>Arch 405 Visual Arts</td>
</tr>
<tr>
<td>Arch 491 Arch. &amp; Town Plan.</td>
<td>11 (5,18)</td>
<td>Arch 481 Office Practice</td>
</tr>
<tr>
<td>Electives</td>
<td>4</td>
<td>Arch 492 Arch. Thesis</td>
</tr>
<tr>
<td><strong>17</strong></td>
<td></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>
OPTION II

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch 405 Visual Arts</td>
<td>Arch 414 Arch. History IV</td>
</tr>
<tr>
<td>Arch 415 Structural Methods</td>
<td>Arch 476 Mechanical Plant</td>
</tr>
<tr>
<td>Arch 475 Mechanical Plant</td>
<td>CE 309 Structural Design</td>
</tr>
<tr>
<td>CE 308 Structural Analysis</td>
<td>Engl 301 Public Speaking</td>
</tr>
<tr>
<td>CE 331 Soil Mechanics</td>
<td>Electives</td>
</tr>
<tr>
<td>Geol 406 Engr. Geology</td>
<td>Electives</td>
</tr>
</tbody>
</table>

18

FIFTH YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch 480 Office Practice</td>
<td>Arch 481 Office Practice</td>
</tr>
<tr>
<td>CE 404 Concrete Structures</td>
<td>CE 453 Adv. Struct. Analysis</td>
</tr>
<tr>
<td>Electives</td>
<td>Electives</td>
</tr>
</tbody>
</table>

18

Each class adviser has an up-to-date list of approved electives giving suggested course sequences. Any exception to this list must be approved in writing by the Dean of the School.

BUILDING CONSTRUCTION CURRICULUM

FIRST YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch 103 Environ. Tech. I</td>
<td>Arch 104 Environ. Tech. II</td>
</tr>
<tr>
<td>Arch 105 Visual Arts</td>
<td>Arch 106 Visual Arts</td>
</tr>
<tr>
<td>Arch Const 141 Elem. of Bldg. I</td>
<td>Arch Const 142 Elem. of Bldg. II</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>AS or MS—Basic</td>
</tr>
</tbody>
</table>

16

SECOND YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch Const 241 Elem. of Bldg. III</td>
<td>Arch Const 242 Elem. of Bldg. IV</td>
</tr>
<tr>
<td>Econ 201 Prin. of Economics</td>
<td>Econ 202 Prin. of Economics</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>Phys 202 General Physics</td>
</tr>
</tbody>
</table>

18

THIRD YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acct 201 Prin. of Accounting</td>
<td>Acct 202 Prin. of Accounting</td>
</tr>
<tr>
<td>Arch 309 Arch. History I</td>
<td>Arch 310 Arch. History II</td>
</tr>
<tr>
<td>Arch 341 Arch. Const.</td>
<td>Arch 442 Arch. Const.</td>
</tr>
<tr>
<td>EM 201 Statics</td>
<td>Arch 476 Mechanical Plant</td>
</tr>
<tr>
<td>Engl 301 Public Speaking</td>
<td>CE 416 Structural Design</td>
</tr>
<tr>
<td>Soc 301 Introd. Sociology</td>
<td>IM 302 Industrial Management</td>
</tr>
</tbody>
</table>

18

FOURTH YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch 413 Arch. History III</td>
<td>Arch 414 Arch. History IV</td>
</tr>
<tr>
<td>Arch 441 Arch. Const.</td>
<td>Arch 442 Arch. Const.</td>
</tr>
<tr>
<td>Arch 475 Mechanical Plant</td>
<td>Arch 476 Mechanical Plant</td>
</tr>
<tr>
<td>CE 308 Structural Design</td>
<td>CE 416 Structural Design</td>
</tr>
<tr>
<td>Geol 406 Engr. Geology</td>
<td>IM 302 Industrial Management</td>
</tr>
<tr>
<td>IM 301 Cost Accounting</td>
<td>Soc 405 Industrial Sociology</td>
</tr>
</tbody>
</table>

18

FIFTH YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch Const 443 Const. Mgt</td>
<td>Arch Const 444 Bldg. Const. Thesis</td>
</tr>
<tr>
<td>Arch 480 Office Practice</td>
<td>Arch 481 Office Practice</td>
</tr>
<tr>
<td>CE 331 Soil Mechanics</td>
<td>Econ 313 Commercial Law</td>
</tr>
<tr>
<td>Econ 315 Commercial Law</td>
<td>IE 304 Methods and Standards</td>
</tr>
<tr>
<td>IE 303 Job Evaluation</td>
<td>Electives</td>
</tr>
</tbody>
</table>

18

Each class adviser has an up-to-date list of approved electives giving suggested course sequences. Any exception to this list must be approved in writing by the Dean of the School.
COLLEGE OF ARTS AND SCIENCES

In addition to acting as a service school to all other colleges and schools of the University by furnishing nearly all of the instruction in the humanities, the physical sciences, and the social sciences, considered essential for a well-educated graduate, the College of Arts and Sciences offers seven major curriculums leading to the Bachelor of Science degree which are as follows: Chemistry, Geology, Mathematics, Medical Technology, Physics, Pre-Medicine, and Science Teaching. In addition, the College offers a curriculum in the Arts and Sciences leading to the Bachelor of Arts degree. Major concentrations under the Bachelor of Arts program may be taken in the following areas: Chemistry, Economics, English, Geology, History, Mathematics, Modern Languages, or Natural Sciences. Furthermore, the College of Arts and Sciences offers programs leading to graduate degrees in several of these fields.

BACHELOR OF ARTS CURRICULUM

The curriculum leading to the Bachelor of Arts degree is designed to meet the needs of those students who desire a broad general education as a preparation for intelligent citizenship and for those who desire to teach in the secondary schools. The first two years are spent in introductory work in various areas, in order to give the student breadth of view and to enable him to take a more intelligent part in his own education. During the last two years the student concentrates in selected fields. This curriculum provides an excellent background for pre-law students, business, and journalism.

The work required in the Bachelor of Arts curriculum for the freshman year is as shown below, with the few exceptions noted depending on major or minor concentrations during the later years.

<table>
<thead>
<tr>
<th></th>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Freshman Year</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Second Semester</td>
</tr>
<tr>
<td>Engl 101 Engl. Composition</td>
<td>3 (3,0)</td>
<td>Engl 102 Engl. Composition</td>
</tr>
<tr>
<td>Hist 101 American History</td>
<td>3 (3,0)</td>
<td>Hist 102 American History</td>
</tr>
<tr>
<td>Math 101 Math. Analysis*</td>
<td>3 (3,0)</td>
<td>Math 102 Math. Analysis*</td>
</tr>
<tr>
<td>Modern Language</td>
<td>3 (3,1)</td>
<td>Modern Language</td>
</tr>
<tr>
<td>Physical Science†</td>
<td>4</td>
<td>Physical Science†</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>17</td>
</tr>
</tbody>
</table>

* Those students planning to concentrate in Chemistry, Geology, or Natural Sciences schedule Math 105, 106 instead of Math 101, 102; those concentrating in Mathematics or Mathematics Teaching schedule Math 106, 205.
† Election of a two semester sequence of the same Physical Science is required; however, those concentrating in Chemistry, Mathematics Teaching, or Natural Sciences must schedule Chemistry.

Preferably on entrance, and not later than the end of his sophomore year, each student in the Bachelor of Arts curriculum must select a primary and secondary (major and minor) field of concentration from the following:
Major
Chemistry
Economics
English
Geology
History
Mathematics
Modern Languages
Natural Sciences

Minor
Biology
Chemistry
Economics
English
Geology
History
Mathematics
Modern Languages
Psychology
Secondary Education
Sociology

The major concentration requires 24 semester hours and the minor 15 semester hours above the sophomore level unless otherwise indicated.

These fit into the basic curriculum for the three upper-class years with minor variations depending on the specific major or minor selected.

The total number of hours required for the Bachelor of Arts curriculum varies from 128 to 135 depending on the major and minor concentrations.

### First Semester

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bot 101 General Botany</td>
<td>4 (3.3)</td>
</tr>
<tr>
<td>Econ 201 Prin. of Economics</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Engl 203 Surv. of Engl. Lit.</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Hist 203 Hist. of Civilization</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Modern Language*</td>
<td>3 (3.1)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

### Second Semester

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 204 Survey of Engl. and Amer. Lit.</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Hist 204 Hist. of Civilization</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Modern Language*</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Music 310 Music Appreciation§</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>or Arch 403 Intro. to Vis. Arts</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Zool 101, 103 Gen. Zoology</td>
<td>4 (3.3)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

### Junior Year

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities†</td>
<td>3</td>
</tr>
<tr>
<td>Major</td>
<td>6</td>
</tr>
<tr>
<td>Minor</td>
<td>3</td>
</tr>
<tr>
<td>Modern Language*</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

### Senior Year

<table>
<thead>
<tr>
<th>Subject</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major</td>
<td>6</td>
</tr>
<tr>
<td>Minor</td>
<td>6</td>
</tr>
<tr>
<td>Social Sciences‡</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

The minimum number of hours required for graduation varies from 128 to 135 depending on the major and minor concentrations.

* The student may elect either 3 years of 1 foreign language or 2 years of each of 2 languages. In the event a student elects two years of each of two foreign languages, six credits of this total may be used as free electives or to satisfy the requirements of the humanities electives.

† Humanities include Art, English, Foreign Languages, Music, Philosophy and Religion.

‡ Social Sciences include Economics, Government, History, Psychology and Sociology.

§ Students planning to teach should select Arch 403 and take Music 310 during the semester in which Directed Teaching is scheduled.
Detailed information concerning the various combinations of majors and minors is as follows:

**Biology (Secondary Field of Concentration Only).** The recommended program of study consists of the required courses in the Bachelor of Arts curriculum plus 15 semester hours from the field of the biological sciences in addition to Bot 101 and Zool 101, 103. The courses selected must be approved by the student's adviser.

This secondary field of concentration is particularly recommended for those students majoring in geology.

**Bachelor of Arts Curriculum with a Chemistry Major**

Both major and minor concentrations in chemistry are allowed for students in the Bachelor of Arts program. As a major field of concentration, the complete four-year curriculum is as shown below.

(See page 142 for Freshman Year)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bot 101 General Botany</td>
<td>Engl 204 Surv. of Engl. &amp; Am. Lit.</td>
</tr>
<tr>
<td>Math 205 Anal. Geom., Cal. II</td>
<td>Modern Language</td>
</tr>
<tr>
<td>Modern Language</td>
<td>Phys 202 General Physics</td>
</tr>
<tr>
<td>Phys 201 General Physics</td>
<td>Zool 101, 103 Gen. Zoology</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td><strong>18</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

**Junior Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 201 Prin. of Economics</td>
<td>Hist 204 Hist. of Civilization</td>
</tr>
<tr>
<td>Hist 203 Hist. of Civilization</td>
<td>Major</td>
</tr>
<tr>
<td>Major</td>
<td>Minor</td>
</tr>
<tr>
<td>Minor*</td>
<td>Modern Language</td>
</tr>
<tr>
<td>Modern Language</td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

**Senior Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities Elective</td>
<td>Major</td>
</tr>
<tr>
<td>Major</td>
<td>Minor</td>
</tr>
<tr>
<td>Minor*</td>
<td>Music 310 Music Appreciation</td>
</tr>
<tr>
<td>Social Sciences Elective</td>
<td>or Arch 403 Intro to the Visual Arts</td>
</tr>
<tr>
<td><strong>15</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

A minimum of 135 semester hours required for graduation.

* If mathematics is chosen as the minor concentration, Math 205, 206 would satisfy 8 hours of the minor requirement, thus permitting additional electives or more laboratory work in the major field.

For a major or minor concentration in chemistry, the 24 or 15 hours respectively of chemistry will be selected by the individual in consultation with his adviser.

**Economics.** The recommended program of study consists of the required courses of the basic Bachelor of Arts curriculum plus Econ 202. The latter course should be taken the second half of the sophomore year and Music 310 postponed until the junior year. The Econ 202 will be substituted for a 3-hour elective.

Twenty-four semester hours must be completed to fulfill the requirements for a major field of concentration and 15 semester hours to fulfill the requirements for a minor field of concentration.
Courses for a concentration shall be chosen from the following list and shall include Econ 314:


It is strongly recommended that students who anticipate graduate study in economics, minor in mathematics.

Additional approved electives will be added as needed to meet the minimum of 128 semester hours required for graduation.

**English.** For a major concentration, the recommended program of study consists of the required courses of the basic Bachelor of Arts curriculum and 24 semester hours of English above the sophomore level, including the following:

Engl 402, 405 or 406, 423 or 424.

Three courses from the following are required:


One course from the following is required:

Engl 415, 416, 435, 437, 438, 439, 440, 441, 442.

Additional electives from courses listed below will be added as needed to meet the total semester hours required for graduation:


Engl 304, Advanced Composition, or departmental certification of proficiency in composition is required.

For a minor concentration in English, the recommended program of study consists of the required courses of the basic Bachelor of Arts curriculum and 15 semester hours of English above the sophomore level, including:

Engl 405 or 406, 423 or 424.

One course from the following is required:


Additional electives from English courses numbered above 400 will be added as needed to meet the minimum of 128 semester hours required for graduation. Engl 304, Advanced Composition, or departmental certification of proficiency in composition is required.

**Geology.** The recommended program in Geology consists of the required courses in the basic Bachelor of Arts curriculum with the additional requirement that students majoring in Geology must take Math 105 and 106 instead of Math 101 and 102 in the freshman year and Math 205 and 206 in place of Econ 201 and Music 310 in the sophomore year. The latter two courses will be taken in place of electives in the junior year.
Geology majors or minors may elect a second year of Physical Science postponing their Biological Sciences to the junior year.

Twenty-four semester hours must be completed to fulfill the requirements for the primary field of concentration and 15 semester hours to fulfill the requirements for the secondary field of concentration. Courses for concentration are as follows:


Additional approved electives will be added as needed to meet the minimum of 132 semester hours required for graduation.

**History.** The recommended program of study consists of the required courses in the basic Bachelor of Arts curriculum plus Gov 301. The latter course should be taken as the required elective the first half of the junior year.

Twenty-four semester hours must be completed to fulfill the requirements for the primary field of concentration and 15 semester hours to fulfill the requirements for the secondary field of concentration. Courses for concentration shall be chosen from the following list:

Hist 306, 309, 310, 312, 313, 402, 403, 408, 410, 411, 412, 413.

Additional approved electives will be added as needed to meet the minimum of 128 semester hours required for graduation.

**Mathematics.** For a major concentration, the recommended program of study consists of the required courses of the basic Bachelor of Arts curriculum with the additional requirement that students majoring or minoring in Mathematics must take Math 106 and 205 instead of Math 101 and 102 in the freshman year and Math 206 and 305 in place of Econ 201 and Music 310 in the sophomore year. The latter two courses will be taken in place of electives in the junior year.

Twenty-four semester hours of mathematics above the sophomore level must be completed to fill the requirements for the primary field of concentration, including the following:

Math 402, 411, 453, 454.

At least two courses from the following:
Math 306, 310, 412, and any 400-level course.

Fifteen semester hours must be completed to fill the requirements for the secondary field of concentration including the following:
Math 205, 206.

At least two courses from the following:
Math 305, 306, 310, and any 400-level course.
For a minor in a physical science:

Twenty-three semester hours must be completed in one of the sciences. (This includes the basic requirement in a physical science.) Or,

Fifteen hours in another physical science other than that offered to fill the basic requirement.

The minimum number of semester hours for graduation with a major concentration in mathematics will be 131 hours.

### Curriculum for Prospective Mathematics Teachers

(See page 142 for Freshman Year)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bot 101 General Botany</strong></td>
<td><strong>Engl 204 Surv. of Engl. &amp; Am. Lit.</strong></td>
</tr>
<tr>
<td><strong>Engl 203 Survey of Engl. Lit.</strong></td>
<td><strong>Hist 204 Hist. of Civilization</strong></td>
</tr>
<tr>
<td><strong>Hist 203 History of Civilization</strong></td>
<td><strong>Language</strong></td>
</tr>
<tr>
<td><strong>Language</strong></td>
<td><strong>Engl 303 Statistics</strong></td>
</tr>
<tr>
<td><strong>Math 206 Anal. Geom., Cal. III</strong></td>
<td><strong>Math 305 Found. of Analysis</strong></td>
</tr>
<tr>
<td><strong>AS or MS—Basic</strong></td>
<td><strong>AS or MS—Basic</strong></td>
</tr>
<tr>
<td>4 (3,3)</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>3 (3,0)</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>3 (3,0)</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>4 (4,0)</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>1 (2,1)</td>
<td>1 (2,1)</td>
</tr>
<tr>
<td><strong>18</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Junior Year</strong></th>
<th><strong>Senior Year</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ed 301 Hist. of Amer. Ed.</strong></td>
<td><strong>Econ 201 Prin. of Economics</strong></td>
</tr>
<tr>
<td><strong>Math 308 College Geometry</strong></td>
<td><strong>Ed 302 Educational Psych.</strong></td>
</tr>
<tr>
<td><strong>Math 411 Linear Algebra</strong></td>
<td><strong>Gov 301 Amer. Gov. and Pol. Par.</strong></td>
</tr>
<tr>
<td><strong>Language</strong></td>
<td><strong>Language</strong></td>
</tr>
<tr>
<td><strong>Zool 101, 103 Gen. Zoology</strong></td>
<td><strong>Math 412 Intro. to Mod. Alg.</strong></td>
</tr>
<tr>
<td>3 (3,0)</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>3 (3,0)</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>3 (3,0)</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>3 (3,0)</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>4 (3,3)</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td><strong>16</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

| **Arch 403 Introd. to Visual Arts** | **Ed 412 Directed Teaching†** |
| **Ed 355 Adol. Growth and Devel.** | **Ed 424 Techniques of Teaching** |
| **Math 408 Topics in Geometry** | **Ed 458 Health Education** |
| **Math 417 Math Programs** | **Music 310 Mus. Appreciation** |
| **Math Elective** | **Music 310 Mus. Appreciation** |
| 3 (3,0) | 3 (3,0) |
| 3 (3,0) | 3 (3,0) |
| 3 (3,0) | 3 (3,0) |
| **15** | **15** |

A student must have a minimum of 131 semester hours of credit for graduation. Any free hours that the student may have due to a reduction in the language requirement or military requirement are to be taken in economics or government.

Math 402 and 403 or 404 may be used to replace Math 303 and the mathematics elective. If this option is not used, then the mathematics elective may come from the following courses: Math 306, 310, 402, 406, 452, 453. Any mathematics courses which require one of these as a prerequisite will have to be taken outside of the program.

† The last semester of the senior year is a block course and must be taken as listed.

**Modern Languages.** The recommended program in Modern Languages consists of the required courses of the basic Bachelor of Arts curriculum and 24 semester hours in one language or 18 semester hours in one language and 12 semester hours in a second language to fulfill the requirements for the primary field of concentration. Completion of 15 semester hours in one language is required to fulfill the requirements for the secondary field of concentration. Only courses numbered 301 and above may be used in fulfilling these requirements. Courses for concentration shall be chosen from the following, all of which are 3 cr. (3,0):
Er 303, † 304, † 305, † 306, † 403, 404.
Span 303, † 304, † 305, † 306, † 401, 402, 405, 406.

Additional approved electives will be added as needed to meet the minimum of 128 semester hours required for graduation.

*N Required of students with the primary field of concentration in French.
† Required of students with the primary field of concentration in German.
‡ Required of students with the primary field of concentration in Spanish.

**Natural Sciences Concentration**
(In conjunction with a secondary concentration in Education only)
(See page 142 for Freshman Year)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bot 101 General Botany</td>
<td>Engl 204 Survey of Engl. and</td>
</tr>
<tr>
<td>Hist 203 Hist. of Civil</td>
<td>Hist 204 Hist. of Civilization</td>
</tr>
<tr>
<td>Language</td>
<td>Language</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Econ 201 Prin. of Econ</td>
<td>Ed 302 Educational Psych.</td>
</tr>
<tr>
<td>Ed 301 Hist. of Amer.</td>
<td>Geol 304 Historic. Geol.</td>
</tr>
<tr>
<td>Geol 201 Physical Geol.</td>
<td>Geol 305 Historic. Geol. Lab.</td>
</tr>
<tr>
<td>Geol 203 Phys. Geol. Lab.</td>
<td>Language</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Arch 403 Introd. to Visual Arts</td>
<td>Ed 412 Directed Teaching*</td>
</tr>
<tr>
<td>Ed 335 Adol. Growth &amp; Dev.</td>
<td>Ed 424 Techniques of Teaching</td>
</tr>
<tr>
<td>Phys 304 Descriptive Astronomy</td>
<td>Ed 458 Health Education</td>
</tr>
<tr>
<td>Sciences Elective</td>
<td>Music 310 Music Appreciation</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A student must have a minimum of 135 semester credit hours for graduation.
Elective to be taken in one field: Chemistry, Physics, Biology, or Geology—5 hours.
This major combined with Education would meet all state requirements for certification in Natural Science, General Science, and one Science field.
* The last semester of the senior year is a block schedule and must be taken as listed.

**Psychology (Secondary Field of Concentration Only).** The recommended program of study consists of fifteen semester hours of course work beyond Psychology 301. This program may begin in the sophomore year. Courses for the concentration may be selected from Psych 308, 401, 402, 403; Ed 302, 335.

**Secondary Education (Secondary Field of Concentration Only).** The recommended program of study consists of the required courses in the Bachelor of Arts curriculum, a required major concentration in the Bachelor of Arts curriculum, and the basic program specified by the South Carolina State Department of Education. This list of
requirements should be obtained from the Education Adviser before registering for the sophomore year.

The following education courses are required:

Ed 301, 302, 335, 412, 424.

Ed 301, 302, 335 and 424 must be completed in sequence before registering for Ed 412, Directed Teaching. Application to the instructor in charge of Directed Teaching should be made, in writing, twelve months before scheduling Ed 412. A student whose cumulative grade-point ratio is lower than the requirement for graduation will not be permitted to register for Directed Teaching.

In addition, Arch 403, Ed 458, and Music 310 are required for certification in South Carolina. Ed 412 is conducted on a full-day basis for one-half semester. Students taking Ed 412 will register for Ed 424, 458 and Music 310, these three courses being taught on a six-day basis during the first half of the semester.

Recommended teaching fields (primary fields of concentration) are English, Mathematics, Modern Languages, Natural Sciences, and Social Sciences. Requirements for teacher certification vary with the fields. Each semester after the freshman year, course schedules must be approved by the Education Adviser, prior to registration.

Additional approved electives will be added as needed to meet the total semester hours required for graduation.

Sociology (Secondary Field of Concentration Only). The recommended program of study consists of the required courses in the Bachelor of Arts curriculum plus Gov 301. The latter course should be taken as the required elective the first half of the junior year.

Fifteen semester hours must be completed to fulfill the requirements for the secondary field of concentration. Courses for concentration shall be chosen from the following list and shall include Soc 301 and 302:

Soc 301, 302, 402, 404, 405, 406, 407, 408.

Additional approved electives will be added as needed to meet the total semester hours required for graduation.

BACHELOR OF SCIENCE CURRICULUMS

CHEMISTRY

Chemistry, the study of the composition of matter, is an interesting and extremely useful introduction to the discipline of science. In its methods it combines valuable training in accuracy of observa-
tion with applied reasoning. In its content it embraces knowledge indispensable to an enlightened conception of the world.

Due to the fundamental importance of chemistry, there is a great demand for men and women especially trained in this field. An increasing number of executives in industry are men with training in chemistry, and intermediate positions offer an unusual variety of occupational prospects; experiment and development in laboratories; supervision and production in plant, sales, and consultation.

Women chemists find ready employment in medical research, and in the food, textile and cosmetics industries. Other careers are open to those who combine some work in chemistry with secretarial training or with foreign languages, especially German and Russian.

Because of the large number of elective hours in the chemistry curriculum, it is possible to arrange a course of study which will include work in another area of interest in order to broaden the student’s education, or to more precisely fit him for the specific career he may have in view.

### CHEMISTRY CURRICULUM

#### Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 101 General Chemistry</td>
<td>Ch 102 Gen. Chemistry</td>
</tr>
<tr>
<td>Ger 101 Elementary German</td>
<td>Ger 102 Elementary German</td>
</tr>
<tr>
<td>Hist 101 American History</td>
<td>Math 205 Anal. Geom., Cal. II</td>
</tr>
<tr>
<td>Math 106 Anal. Geom., Cal. I</td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>Elective*</td>
</tr>
<tr>
<td></td>
<td>3 (3,0)</td>
</tr>
<tr>
<td><strong>18</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

#### Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 323 Org. Chem.</td>
<td>Ch 219 Chemical Principles</td>
</tr>
<tr>
<td>Ch 325 Org. Chem. Lab</td>
<td>Ch 324 Org. Chem.</td>
</tr>
<tr>
<td>Math 206 Anal. Geom., Cal. III</td>
<td>Engl 204 Survey of Engl. and</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>Phys 214 Gen. Phys. Lab.</td>
</tr>
<tr>
<td></td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td></td>
<td>1 (2,1)</td>
</tr>
<tr>
<td><strong>18</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

#### Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 316 Quan. Analysis</td>
<td>Ch 332 Phys. Chemistry</td>
</tr>
<tr>
<td>Ch 331 Phys. Chemistry</td>
<td>Ch 334 Phys. Chemistry Lab.</td>
</tr>
<tr>
<td>Ch 333 Phys. Chemistry Lab.</td>
<td>Phys 351 Introd. to Mod. Physics</td>
</tr>
<tr>
<td>Ch 442 Chem. Lit.</td>
<td>Electives*</td>
</tr>
<tr>
<td>Math 306 Ord. Diff. Equations</td>
<td>Electives*</td>
</tr>
<tr>
<td>Elective*</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td></td>
<td>17</td>
</tr>
<tr>
<td><strong>17</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

#### Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 402 Inorg. Chem.</td>
<td>Ch 411 Instr. Analysis</td>
</tr>
<tr>
<td>Electives*</td>
<td>Electives*</td>
</tr>
<tr>
<td></td>
<td>4 (2,6)</td>
</tr>
<tr>
<td></td>
<td>14</td>
</tr>
<tr>
<td><strong>18</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

A minimum of 140 semester hours required for graduation.

* Electives:

For the degree of B.S. in Chemistry, a student must elect at least 18 hours in English, Languages, History, Government, Economics, Sociology, Psychology, etc.
Geology is a relatively young science. The word itself is only about 200 years old. It means the science of the earth. Such a science must be involved with the physics and chemistry of materials which comprise the earth, but equally important it must consider the development of life on earth. Fundamentally then the chemical, physical, and biological responses to various environments on and in the earth must be thoroughly understood so that the historical development of the earth may be deduced, predictions of the future inferred, and natural resources intelligently developed.

Industry in our modern civilization is dependent on minerals and rocks. Metals have their origin in them as do our chief power sources, coal, petroleum, and radio-active minerals. The power and wealth of nations depend largely on their exploration, control and development of mineral wealth.

Geologists today are entering upon a new era. Widening horizons are indicated by employment not only in mineral producing industries but by railroads, municipalities, engineering firms, and water authorities. For this reason, it is important that the geologists’ education rest on a broad yet rigorous base.

This curriculum provides the student with the fundamentals in the geological sciences and excellent support in the other basic sciences. On successful completion of the Bachelor of Science program the student should be adequately prepared for employment or for graduate study in any field of geology.

**GEOLOGY CURRICULUM**

**FRESHMAN YEAR**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 101 General Chemistry</td>
<td>Ch 102 General Chemistry</td>
</tr>
<tr>
<td>Engl 101 English Composition</td>
<td>Engl 102 English Composition</td>
</tr>
<tr>
<td>Hist 101 American History</td>
<td>Hist 102 American History</td>
</tr>
<tr>
<td>Modern Language*</td>
<td>Modern Language*</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Geol 201 Physical Geology</td>
<td>Engl 204 Surv. of Engl. &amp; Am. Lit.</td>
</tr>
<tr>
<td>Geol 203 Phys. Geol. Lab.</td>
<td>Geol 304 Historical Geology</td>
</tr>
<tr>
<td>Modern Language</td>
<td>Modern Language</td>
</tr>
<tr>
<td>Zool 101 Gen. Zoology</td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>15</td>
</tr>
</tbody>
</table>

|                                                    |                                                     |
| 19                                                 |                                                     |
JUNIOR YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geol 306 Mineralogy</td>
<td>Ex St 401 Introd. Statistics</td>
</tr>
<tr>
<td>Phys 211 Gen. Phys. for Engr.</td>
<td>Geol 309 Petrology</td>
</tr>
<tr>
<td>Electives†</td>
<td>Phys 212 Gen. Phys. for Engr.</td>
</tr>
<tr>
<td></td>
<td>Electives†</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

17

Summer Geology Field Camp,† 6 semester hours

<table>
<thead>
<tr>
<th>SENIOR YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geol 402 Structural Geology</td>
</tr>
<tr>
<td>Geol 403 Invert. Paleontology</td>
</tr>
<tr>
<td>Approved Electives†</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

15

A minimum of 140 semester hours is required for graduation.

* German or French is recommended. Two years in the same language is required.

† At least 12 hours must be elected from the humanities and/or social sciences.

Clemson University does not conduct a field camp in geology, but attendance at a camp approved by the geology staff is required.

MATHEMATICS

The mathematics curriculum is designed to give basic training to those students whose ultimate goal is the creation of mathematical concepts and methods that are of basic and general applicability to the desired subject whether it be physics, computer science, communication theory, data processing, statistics, operations research, economics, or any branch of the physical sciences in which a strong mathematical background is a prerequisite. In addition to containing basic mathematics courses which are needed to prepare the student for the present day mathematical world, the curriculum allows the student in his junior year, to select one of five optional sets of courses which will provide an introduction to an area where mathematics is applied. These options are physics operations research, computer science, managerial science and communications.

This curriculum provides an adequate background for the student who plans to pursue graduate study in mathematics and at the same time adequately prepares the student to fill many interesting positions in space research, computer development, business, or government research.

MATHEMATICS CURRICULUM

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Freshman Year</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 101 General Chemistry</td>
<td>Ch 102 General Chemistry</td>
<td></td>
</tr>
<tr>
<td>Engl 101 English Composition</td>
<td>Engl 102 English Composition</td>
<td></td>
</tr>
<tr>
<td>Fr 101 Elem. French</td>
<td>Fr 102 Elem. French</td>
<td></td>
</tr>
<tr>
<td>or Ger 101 Elem. German</td>
<td>or Ger 102 Elem. German</td>
<td></td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>Phys 122 Mech. and Wave Phen.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AS or MS—Basic</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

15

18
**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 203 Survey of Engl. Lit.</td>
<td>3</td>
</tr>
<tr>
<td>Fr 201 Inter. French</td>
<td>3</td>
</tr>
<tr>
<td>or Ger 201 Elem. German</td>
<td>3</td>
</tr>
<tr>
<td>Hist 101 American History</td>
<td>3</td>
</tr>
<tr>
<td>Math 206 Anal. Geom., Cal. III</td>
<td>4</td>
</tr>
<tr>
<td>Phys 221 Gen. Phys. for Engr.</td>
<td>3</td>
</tr>
<tr>
<td>Phys 223 Gen. Phys. Lab.</td>
<td>1</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>2</td>
</tr>
</tbody>
</table>

**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 204 Surv. of Engl. &amp; Am. Lit.</td>
<td>3</td>
</tr>
<tr>
<td>Fr 202 Inter. French</td>
<td>3</td>
</tr>
<tr>
<td>or Ger 202 Inter. German</td>
<td>3</td>
</tr>
<tr>
<td>Math 305 Found. of Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Math 306 Diff. Equations</td>
<td>3</td>
</tr>
<tr>
<td>Phys 222 Gen. Phys. for Engr.</td>
<td>3</td>
</tr>
<tr>
<td>Phys 224 Gen. Phys. Lab.</td>
<td>1</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>2</td>
</tr>
</tbody>
</table>

**Sophomore Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 201 Principles of Econ.</td>
<td>3</td>
</tr>
<tr>
<td>Engl 301 Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>Math 411 Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>Math Elective</td>
<td>3</td>
</tr>
<tr>
<td>Option†</td>
<td>3</td>
</tr>
<tr>
<td>Elective‡</td>
<td>3</td>
</tr>
</tbody>
</table>

**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hist 301 U.S. Since 1865</td>
<td>3</td>
</tr>
<tr>
<td>Math 310 Computer Programming</td>
<td>3</td>
</tr>
<tr>
<td>Math 412 Intro. to Mod. Algebra</td>
<td>3</td>
</tr>
<tr>
<td>Math Elective</td>
<td>3</td>
</tr>
<tr>
<td>Option†</td>
<td>3</td>
</tr>
<tr>
<td>Elective‡</td>
<td>3</td>
</tr>
</tbody>
</table>

**Junior Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 402 Theory of Probability</td>
<td>3</td>
</tr>
<tr>
<td>Math Elective</td>
<td>3</td>
</tr>
<tr>
<td>Option†</td>
<td>3</td>
</tr>
<tr>
<td>Elective‡</td>
<td>3</td>
</tr>
</tbody>
</table>

**Senior Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 403 Statistical Inference</td>
<td>3</td>
</tr>
<tr>
<td>or Math 404 Stochastic Processes</td>
<td>3</td>
</tr>
<tr>
<td>Math 464 Math. Anal. II</td>
<td>3</td>
</tr>
<tr>
<td>Math Elective</td>
<td>3</td>
</tr>
<tr>
<td>Elective‡</td>
<td>6</td>
</tr>
</tbody>
</table>

A minimum of 134 semester hours required for graduation.

* The elective mathematics courses are as follows: Math 313, 403, 404, 407, 408, 409, 413, 427, 428, 429, 451, 452, 455, 457, 458, and approved courses in the 500 series.

† The options are as follows: Physics, which includes Phys 321, Phys 322, Phys 341, and one of Phys 351 and Phys 441; Operations Research, which includes IE 404, IE 415, IE 411, Math 429, and Math 452; Managerial Science, which includes Econ 202, Econ 314, IM 404, IE 415, and IM 311; Communications, which include EE 307, EE 308, EE 320, EE 324, EE 410, and recommended but not required, EE 327 and EE 328; and Computer Science which includes Math 409, Math 427, Math 428, Math 429, and Math 452.

‡ The electives may be taken from those courses which the catalog lists as approved electives for students in the College of Arts and Sciences.

**MEDICAL TECHNOLOGY**

Medical technologists are individuals who are qualified to perform a wide variety of chemical, microscopical, and bacteriological tests to aid physicians in the detection, diagnosis, and treatment of disease. They are usually responsible to a medical doctor, generally a pathologist (one who specializes in the nature and causes of disease). Some technologists work under the supervision of a medical scientist who specializes in a particular branch of clinical science. The largest group of medical technologists work in hospital laboratories and the demand exceeds the supply at the present time.

In cooperation with the School of Medical Technology of the Greenville General Hospital, Greenville, South Carolina, Clemson University offers a four-year curriculum leading to the degree of Bachelor of Science in Medical Technology. The first three years of this program are spent in classwork at Clemson. For the fourth year, the student resides in Greenville, where he will take courses and work under instructors on the staff of the School of Medical Technology of the Greenville General Hospital.
Upon satisfactory completion of the prescribed courses, the student will be awarded the Bachelor of Science degree in Medical Technology.

During the final year of work at the Greenville General Hospital, both room and board are furnished by the hospital.

**MEDICAL TECHNOLOGY CURRICULUM**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td><strong>Second Semester</strong></td>
</tr>
<tr>
<td>Ch 101 General Chemistry</td>
<td>Bot 101 General Botany</td>
</tr>
<tr>
<td>Engl 101 Engl. Composition</td>
<td>Ch 102 General Chemistry</td>
</tr>
<tr>
<td>Hist 101 American History</td>
<td>Engl 102 Engl. Composition</td>
</tr>
<tr>
<td>Math 101 Mathematical Analysis</td>
<td>Math 102 Mathematical Analysis</td>
</tr>
<tr>
<td>Modern Language</td>
<td>Modern Language</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td><strong>Total Credits:</strong> 17</td>
<td>18</td>
</tr>
</tbody>
</table>

**Sophomore Year**

<table>
<thead>
<tr>
<th>Ch 323 Org. Chem.</th>
<th>Ch 324 Org. Chemistry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 203 Survey of Engl. Lit.</td>
<td>Econ 201 Frinc. of Economics</td>
</tr>
<tr>
<td>Hist 102 American History</td>
<td>Engl 204 Surv. of Engl. &amp; Am. Lit.</td>
</tr>
<tr>
<td>Modern Language</td>
<td>Modern Language</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td><strong>Total Credits:</strong> 18</td>
<td>18</td>
</tr>
</tbody>
</table>

**Junior Year**

<table>
<thead>
<tr>
<th>Ch 316 Quan. Analysis</th>
<th>Bact 301 Gen. Bacteriology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 202 Frinc. of Economics</td>
<td>Hist 204 Hist. of Civilization</td>
</tr>
<tr>
<td>Hist 203 Hist. of Civilization</td>
<td>Psych 301 Gen. Psychology</td>
</tr>
<tr>
<td>Phys 204 Gen. Physics Lab.</td>
<td>Electives</td>
</tr>
<tr>
<td>Zool 301 Comp. Vert. Anat.</td>
<td><strong>Total Credits:</strong> 16</td>
</tr>
<tr>
<td><strong>Total Credits:</strong> 18</td>
<td></td>
</tr>
</tbody>
</table>

**Senior Year**

<table>
<thead>
<tr>
<th>Med Tech 401</th>
<th>Serology and Immunology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Med Tech 402</td>
<td>Microbiology</td>
</tr>
<tr>
<td>Med Tech 403</td>
<td>Hematology</td>
</tr>
<tr>
<td>Med Tech 404</td>
<td>Blood Bank</td>
</tr>
<tr>
<td>Med Tech 405</td>
<td>Cytology</td>
</tr>
<tr>
<td>Med Tech 406</td>
<td>Histology</td>
</tr>
<tr>
<td>Med Tech 407</td>
<td>Urinalysis</td>
</tr>
<tr>
<td>Med Tech 408</td>
<td>Chemistry</td>
</tr>
<tr>
<td>Med Tech 409</td>
<td>Radioisotopes</td>
</tr>
<tr>
<td><strong>Total Credits:</strong> 36</td>
<td></td>
</tr>
</tbody>
</table>

*The minimum number of credit hours required for graduation in this curriculum is 141. First figure represents lecture hours, second figure represents seminar hours, and third figure represents clinical practice hours.

**Physics**

The curriculum in Physics is intended to give a thorough knowledge of the fundamental principles of physics. This course combines sound theoretical training and extensive laboratory practices in the various branches of physics with considerable work in one related field such as Chemistry or Electrical Engineering. The student is required to take at least two advanced mathematics courses; other
technical courses may be taken as electives if desired. On completing this curriculum the student should be prepared to enter research in an industrial or government laboratory; the curriculum also provides an excellent background for advanced work in the field of nuclear science, or for graduate work in Physics.

PHYSICS CURRICULUM

FIRST SEMESTER

FRESHMAN YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 101 General Chemistry</td>
<td>4 (3.3)</td>
</tr>
<tr>
<td>Engl 101 English Comp.</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Ger 101 Elementary German*</td>
<td>3 (3.1)</td>
</tr>
<tr>
<td>Math 106 Anal. Geom., Cal. I</td>
<td>4 (4.0)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2.1)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

SECOND SEMESTER

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 102 General Chemistry</td>
<td>4 (3.3)</td>
</tr>
<tr>
<td>Engl 102 English Composition</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Ger 102 Elementary German*</td>
<td>3 (3.1)</td>
</tr>
<tr>
<td>Math 205 Anal. Geom., Cal. II</td>
<td>4 (4.0)</td>
</tr>
<tr>
<td>Phys 152 Gen. Physics I</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Phys 133 Exp. Physics I</td>
<td>1 (0.3)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2.1)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>19</strong></td>
</tr>
</tbody>
</table>

SOPHOMORE YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 204 Surv. of Engl. Lit.</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Math 206 Anal. Geom., Cal. III</td>
<td>4 (4.0)</td>
</tr>
<tr>
<td>Phys 231 Gen. Phys. II</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Phys 233 Exp. Phys. II</td>
<td>1 (0.3)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2.1)</td>
</tr>
<tr>
<td>Approved Elective</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

JUNIOR YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hist 204 Hist. of Civilization</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Math (as approved)†</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Phys 321 Mechanics I</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Phys 325 Exp. Physics I</td>
<td>4 (2.6)</td>
</tr>
<tr>
<td>Approved Electives</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phys 322 Mechanics II</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Phys 326 Exp. Physics II</td>
<td>4 (2.6)</td>
</tr>
<tr>
<td>Phys 341 Elect. &amp; Magnetism</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Approved Electives</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

SENIOR YEAR

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phys 441 Elect. &amp; Magn.</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Phys 455 Mod. Physics</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Phys 465 Thermo. &amp; Stat. Mech.</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Approved Electives†</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

A minimum of 136 semester hours is required for graduation.

*Fr 101, 102 or Russ 101, 102 may be substituted for Ger 101, 102.
† Recommend Math 411.
†† Recommend Math 453, 454.

PRE-MEDICINE

The curriculum in Pre-Medicine is designed to meet the general entrance requirements of standard medical colleges. Since, however, requirements for entrance to various medical schools are not uniform, the student before choosing his electives should consult the specific requirements of the medical college of his preference.

Those preparing for the study of medicine are advised to complete four years of undergraduate work before entering a medical school, although some medical colleges will accept a student after three years of Pre-Medicine.
Students preparing for the study of dentistry find the first two years of this curriculum appropriate for the purpose.

**PRE-MEDICINE CURRICULUM**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Freshman Year</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 101 General Chemistry</td>
<td>4 (3,3)</td>
<td>Bot 101 General Botany</td>
</tr>
<tr>
<td>Engl 101 Engl. Composition</td>
<td>3 (3,0)</td>
<td>Ch 102 General Chemistry</td>
</tr>
<tr>
<td>Hist 101 American History</td>
<td>3 (3,0)</td>
<td>Engl 102 Engl. Composition</td>
</tr>
<tr>
<td>Math 101 Mathematical Analysis</td>
<td>3 (3,0)</td>
<td>Math 102 Mathematical Analysis</td>
</tr>
<tr>
<td>Modern Language</td>
<td>3 (3,1)</td>
<td>Modern Language</td>
</tr>
<tr>
<td>AS or MS—Basic.</td>
<td>1 (2,1)</td>
<td>AS or MS—Basic.</td>
</tr>
<tr>
<td><strong>17</strong></td>
<td></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 323 Org. Chem.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Ch 327 Org. Chem. Lab.</td>
<td>1 (0,8)</td>
</tr>
<tr>
<td>Engl 203 Survey of Engl. Lit.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Hist 102 American History</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Modern Language</td>
<td>3 (3,1)</td>
</tr>
<tr>
<td>Zool 101 Gen. Zoology</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Zool 103 Gen. Zool. Lab.</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>AS or MS—Basic.</td>
<td>1 (2,1)</td>
</tr>
<tr>
<td><strong>18</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Junior Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 316 Quan. Analysis</td>
<td>5 (3.6)</td>
</tr>
<tr>
<td>Econ 202 Prin. of Economics</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Hist 203 Hist. of Civilization</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Phys 202 Gen. Physics</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Phys 204 Gen. Physics Lab.</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
</tr>
<tr>
<td><strong>18</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Senior Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 301 Public Speaking</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Soc 301 Introd. Sociology</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Zool 302 Vertebrate Embryology</td>
<td>3 (2,3)</td>
</tr>
<tr>
<td>Electives</td>
<td>6</td>
</tr>
<tr>
<td><strong>15</strong></td>
<td></td>
</tr>
</tbody>
</table>

A minimum of 134 semester hours required for graduation.

**SCIENCE TEACHING**

The program leading to a Bachelor of Science degree in Science Teaching is designed for students planning to teach Mathematics, Biology, Chemistry or Physics and General Science on the secondary school level.

It requires a major concentration in Mathematics, Biology, Chemistry or Physics and a secondary concentration in Secondary Education. The required science electives are included to give some degree of competency in a field other than the major area.

The freshman year is identical for the four majors. Since the sophomore courses differ according to the major field, students should follow the printed curriculum closely.
## Pre-Pharmacy Curriculum

Pharmacy is a five-year program, the first two years of which will be taken at Clemson and the student who does pre-pharmacy here will, as a rule, transfer to the S. C. Medical College. His degree, once he completes the final three years, will be in Pharmacy and will be awarded by the School of Pharmacy of the Medical College, not by Clemson.

### Pre-Pharmacy Curriculum

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Freshman Year</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 101 General Chemistry ... 4 (3,3)</td>
<td>Ch 102 General Chemistry ... 4 (3,3)</td>
<td>Ch 102 General Chemistry ... 4 (3,3)</td>
</tr>
<tr>
<td>Engl 101 English Composition ... 3 (3,0)</td>
<td>Engl 102 English Composition ... 3 (3,0)</td>
<td>Engl 102 English Composition ... 3 (3,0)</td>
</tr>
<tr>
<td>Hist 101 American History ... 3 (3,0)</td>
<td>Hist 102 American History ... 3 (3,0)</td>
<td>Hist 102 American History ... 3 (3,0)</td>
</tr>
<tr>
<td>AS or MS—Basic ... 1 (2,1)</td>
<td>AS or MS—Basic ... 1 (2,1)</td>
<td>AS or MS—Basic ... 1 (2,1)</td>
</tr>
<tr>
<td><strong>15</strong></td>
<td><strong>15</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bot 101 General Botany ... 4 (3,3)</td>
<td>Engl 204 Surv. of Engl. &amp; Am. Lit ... 3 (3,0)</td>
</tr>
<tr>
<td>Econ 201 Prin. of Economics ... 3 (3,0)</td>
<td>Math 305 Found. of Anal. ... 3 (3,0)</td>
</tr>
<tr>
<td>Engl 203 Surv. of English Lit. ... 3 (3,0)</td>
<td>Major ... 3</td>
</tr>
<tr>
<td>Math 206 Anal. Geom., Cal. III ... 4 (4,0)</td>
<td>Phys 202 Gen. Physics† ... 3 (3,0)</td>
</tr>
<tr>
<td>Phys 201 Gen. Physics† ... 3 (3,0)</td>
<td>Phys 204 Gen. Physics Lab.† ... 1 (0,3)</td>
</tr>
<tr>
<td>Phys 203 Gen. Physics Lab.† ... 1 (0,3)</td>
<td>Zool 101 Gen. Zoology ... 3 (3,0)</td>
</tr>
<tr>
<td>AS or MS—Basic ... 1 (2,1)</td>
<td>Zool 105 Gen. Zoology Lab. ... 1 (0,3)</td>
</tr>
<tr>
<td><strong>19</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Junior Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ed 301 History of Amer. Ed ... 3 (3,0)</td>
<td>Ed 302 Ed. Psychology ... 3 (3,0)</td>
</tr>
<tr>
<td>Hist 203 Hist. of Civilization ... 3 (3,0)</td>
<td>Hist 204 History of Civilization ... 3 (3,0)</td>
</tr>
<tr>
<td>Major ... 3</td>
<td>Major ... 9</td>
</tr>
<tr>
<td>Science Elective† ... 3</td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Senior Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch 403 Introd to Vis. Arts ... 3 (3,0)</td>
<td>Ed 412 Directed Teaching* ... 6 (1,15)</td>
</tr>
<tr>
<td>Ed 335 Adol. Growth and Develop. ... 3 (3,0)</td>
<td>Ed 424 Tech. of Teaching ... 3 (3,0)</td>
</tr>
<tr>
<td>Gov 301 Amer. Gov. and Pol. Par. ... 3 (3,0)</td>
<td>Ed 458 Health Education ... 3 (3,0)</td>
</tr>
<tr>
<td>Major ... 3</td>
<td>Music 310 Music Appreciation ... 3 (3,0)</td>
</tr>
<tr>
<td>Science Elective† ... 3</td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

A student must have a minimum of 150 semester hours of credit for graduation.

* Block schedule of courses to be taken as shown.
† If the student is to major in physics or wishes to take his science electives in the field of physics, then these courses are to be replaced by Phys 211, 212, 213, and 214.
‡ The science electives are to come from the fields of astronomy, biology, chemistry, geology, mathematics, or physics and will not be from the same field as the major.
§ Students majoring in biology should schedule eight semester hours in chemistry in place of Math 205 and 206.
### Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 203 Survey of Eng. Lit.</td>
<td>Econ 201 Prin. of Economics</td>
</tr>
<tr>
<td>Hist 102 American History</td>
<td>Engl 204 Survey of Engl. and Amer. Literature</td>
</tr>
<tr>
<td>Modern Language</td>
<td>Modern Language</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>AS or MS—Basic</td>
</tr>
</tbody>
</table>

18 17

### Approved Electives for Students in the College of Arts and Sciences

The following are approved electives in the College of Arts and Sciences:

All undergraduate courses taught in the College of Arts and Sciences except the following:

Ch 450, Ed 460, 494, Engl 351, Geol 406, Phys 460.

Certain upper-level courses, not given in the College of Arts and Sciences, listed below, plus others recommended in a particular Arts and Sciences curriculum:


In exceptional instances certain other courses, but not in excess of 6 semester hours for the Bachelor of Arts program and 9 hours for other Arts and Sciences curriculums, may be approved by the class adviser and the Dean of the College of Arts and Sciences.

### College of Engineering

Nine curriculums are offered under the College of Engineering: Agricultural Engineering, Ceramic Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Education, Industrial Engineering, Mechanical Engineering, and Metallurgical Engineering. The curriculums in Agricultural, Ceramic, Chemical, Civil, Electrical, and Mechanical Engineering are accredited by the Engineers' Council for Professional Development. The curriculum in Agricultural Engineering is jointly administered by the College of Engineering and the College of Agriculture and Biological Sciences.

Although the College of Engineering does not offer specific options or majors under each of these curriculums, the instruction includes many phases of each respective field. Thus, a Civil Engineering student is graduated in Civil Engineering rather than structural engineering, highway engineering, sanitary engineering or other
such options, but the curriculum in Civil Engineering includes definite preparation along these lines. In the same way, the other engineering curriculums include thorough education in various phases of the field of specialization without over-emphasizing one phase to the neglect of others.

All engineering consists of the application of the laws of physics, chemistry, and mathematics to the solution of specific problems. Furthermore, any engineer must be able to express his ideas both in words and in graphical communications. For these two reasons the first two years of all the branches of Engineering here listed are substantially the same and deal largely with the fundamentals mentioned above.

In all curriculums, over-specialization is carefully avoided by the inclusion of subjects which involve the most direct application of the basic sciences and which serve to develop habits of orderly analysis and logical thinking. Each curriculum leads to a wide range of choice of a career and serves as preparation for continued on-the-job study following graduation, or further formal graduate study in a broad spectrum of fields.

The work required in all Engineering curriculums for the freshman year is as follows except as noted:

<table>
<thead>
<tr>
<th>First Semester</th>
<th>FRESHMAN YEAR</th>
<th>Second Semester *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 101 General Chemistry 4 (3,3)</td>
<td>Ch 102 General Chemistry 4 (3,3)</td>
<td></td>
</tr>
<tr>
<td>Engr 101 Engineering Systems 0 (1,0)</td>
<td>Engl 102 English Composition 3 (3,0)</td>
<td></td>
</tr>
<tr>
<td>EG 109 Engr. Com. and Design 3 (1,6)</td>
<td>Hist 104 Western Civilization 3 (3,0)</td>
<td></td>
</tr>
<tr>
<td>or Hist 104 Western Civ. 3 (3,0)</td>
<td>or EG 109 Engr. Com. and Design 3 (1,6)</td>
<td></td>
</tr>
<tr>
<td>Engl 101 English Composition 3 (3,0)</td>
<td>Math 205 Anal. Geom., Cal. II 4 (4,0)</td>
<td></td>
</tr>
<tr>
<td>AS or MS—Basic 1 (2,1)</td>
<td>AS or MS—Basic 1 (2,1)</td>
<td></td>
</tr>
</tbody>
</table>

* Agricultural Engineering students take AgBio 101, Introduction to Agriculture and Biological Sciences, in addition to other courses in the second semester.

AGRICULTURAL ENGINEERING

The Agricultural Engineering curriculum is jointly administered by the College of Agriculture and Biological Sciences and the College of Engineering.

Agricultural Engineering deals fundamentally with the application of the engineering sciences to progress in agriculture. Agricultural engineers provide engineering services in the areas of power and machinery, soil and water conservation engineering, farm electrification, agricultural structures, and processing engineering.

The curriculum of Agricultural Engineering leads to the degree of Bachelor of Science in Agricultural Engineering. It is based on
the study of fundamentals of mathematics, physics, chemistry, and biology. The engineering sciences of mechanics, fluids, thermodynamics, and electrical theory, together with the basic agricultural sciences of soils, plants and animals, provide the foundation for the Agricultural Engineering design and analysis. Courses in the humanities are included to provide the student with a well-rounded educational program. Graduate courses are offered leading to advanced degrees.

Opportunities in Agricultural Engineering include employment with industry as design engineers, research engineers, production engineers, and in sales and service; with state and federal agencies as teachers, research engineers, and extension engineers; as field engineers with soil conservation service, bureau of reclamation, etc.; with agricultural enterprises as managers, contractors, equipment retailers and consulting engineers. The Agricultural Engineering curriculum is accredited by the Engineers’ Council for Professional Development.

### Agricultural Engineering Curriculum

(See page 159 for Freshman Year)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Sophomore Year</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>AgE 209 Ag. Engr. Technology</td>
<td>2 (1,3)</td>
<td>AgE 299 Digital Computation</td>
</tr>
<tr>
<td>EM 201 Statics</td>
<td>3 (3,0)</td>
<td>Bot 101 General Botany</td>
</tr>
<tr>
<td>Engl 203 Surv. of Engl. Lit.</td>
<td>3 (3,0)</td>
<td>EM 202 Dynamics</td>
</tr>
<tr>
<td>Phys 221 Ther. &amp; Elec. Phen.</td>
<td>3 (3,0)</td>
<td>Phys 223 Opt. &amp; Mod. Phys.</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>

| Junior Year                                          |                                     |                                                     |
| AgE 355 Engr. Anal. & Creativity                    | 3 (2,3)                            | AgE 362 Energy Conv. in Ag. Sys.                    |
| Agron 202 Soils                                      | 3 (2,3)                            | Bot 352 Plant Physiology                            |
| EE 307 Basic Elec. Engr.                            | 3 (3,0)                            | EE 308 Basic Elec. Engr.                            |
| EM 304 Mech. of Materials                           | 3 (3,0)                            | EM 320 Fluid Mechanics                             |
| Math 309 Engr. Math. II                             | 3 (3,0)                            | Zool 101 General Zoology                            |
|                                                     | 19                                  | 18                                                  |

| Senior Year                                          |                                     |                                                     |
| AgE 431 Ag. Struct. Design                          | 3 (2,3)                            | AgE 416 Agr. Machinery                              |
| AgE 465 Engr. Prop. of Biol. Mat.                   | 3 (2,3)                            | AgE 422 Soil & Water Con. Engr.                     |
| AgE 471 Research                                    | 1 (0,3)                            | AgE 442 Agric. Proc. Engr.                          |
| CrE 310 Introd. to Mat. Science                     | 3 (3,0)                            | Gov 301 Amer. Gov. and Pol. Par.                    |
| or ME 304 Heat Transfer I                           | 3 (3,0)                            | Approved Electives                                 |
| CF 300 Elem. Surveying                              | 2 (1,3)                            |                                                     |
| Econ 201 Prin. of Economics                         | 3 (3,0)                            |                                                     |
| Approved Electives                                  | 3                                  |                                                     |
|                                                     | 18                                  | 16                                                  |
CERAMIC ENGINEERING

The ceramic industries have as their raw materials the non-metallic minerals other than fuel. These minerals constitute over 90 per cent of the earth's crust while the industries dependent on them comprise almost one-third the entire field of industrial activity. Ceramic industries produce products in eight major classifications: structural clay products; glass whitewares; refractories; abrasives; cements; limes and plaster; enameled metals; and raw material processing.

South Carolina possesses a wide variety of ceramic minerals which rank with forests as the richest natural resources in the State and make it possible for South Carolina to contribute raw materials to every major classification of the ceramic industry. South Carolina has a diversified ceramic industry with plants manufacturing portland cement, glass containers, glass fibers, sewer pipes, brick, refractories, special raw materials, and whitewares. The growth of these industries and the development of new ones is to a large measure dependent on the availability of trained engineers capable of incorporating and operating the modern techniques and equipment of the ceramic industries.

The curriculum of Ceramic Engineering leads to the degree of Bachelor of Science in Ceramic Engineering, and graduate courses are offered leading to advanced degrees. The course is based on a study of the fundamental courses in chemistry, physics, mathematics, and geology, and advanced courses are designed to apply these fundamental sciences to Ceramic Engineering. Courses in the humanities and social sciences together with courses in engineering sciences form major parts of the curriculum.

The Olin Foundation in 1953 provided a grant for the construction and equipping of a Ceramic Engineering building. The grant has provided Clemson University with the outstanding facilities for Ceramic Engineering education and research. An excellent ceramic laboratory has been equipped to demonstrate all processes of ceramic manufacturing including beneficiation of ores and clays, grinding and crushing materials, mixing and blending raw materials, forming the materials into various shapes, and drying and firing the prepared objects. Equipment for the control of industrial processes is studied and tests are made to determine the quality of various ceramic products. Well-equipped laboratories are available for research on raw materials and problems of ceramic industries in South Carolina.
Ceramic Engineering graduates find employment as plant executives, research engineers, plant designers and constructors, equipment manufacturers, consulting engineers, ceramic chemists, and technologists in the ceramic industries and in allied fields.

CERAMIC ENGINEERING CURRICULUM
(See page 159 for Freshman Year)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>CrE 201 Introd. Cer.</td>
<td>2 (2,0)</td>
</tr>
<tr>
<td>CrE 299 Digital Computation</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>Engl 203 Surv. of Engl. Lit.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Math 206 Anal. Geom., Cal. III</td>
<td>4 (4,0)</td>
</tr>
<tr>
<td>Phys 221 Ther. &amp; Elec. Phen.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Phys 223 Gen. Phys. Lab.</td>
<td>1 (0,5)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
</tr>
<tr>
<td>Approved Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>18</td>
</tr>
<tr>
<td>CrE 304 Exp. Design</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>CrE 306 Fuels Comb., Heat Trsf.</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>CrE 307 Thermal Proc. of Ceram.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Ch 331 Physical Chem.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>EE 307 Basic EE</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Math 313 Engr. Statistics</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>ME 304 Heat Transfer I</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td></td>
<td>17</td>
</tr>
<tr>
<td>CrE 403 Classes</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>CrE 406 Project</td>
<td>2 (0,6)</td>
</tr>
<tr>
<td>IE 410 Engr. &amp; Organization</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Geol 406 Engr. Geol.</td>
<td>2 (2,3)</td>
</tr>
<tr>
<td>Approved Elective</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>20</td>
</tr>
<tr>
<td>CrE 202 Materials</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>CrE 204 Lab. Procedures</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>EM 201 Statics</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Engl 204 Surv. of Engl. &amp; Am. Lit.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Math 208 Engr. Math. I</td>
<td>4 (4,0)</td>
</tr>
<tr>
<td>Phys 222 Opt. &amp; Mod. Phys.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Phys 224 Gen. Phys. Lab.</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
</tr>
<tr>
<td></td>
<td>19</td>
</tr>
</tbody>
</table>

JUNIOR YEAR

|                |                 |
| CrE 302 Thermo. Chem. Cer. | 3 (3,0) |
| CrE 309 Res. Methods | 2 (0,6) |
| Ch 333 Physical Chemistry | 3 (3,0) |
| EE 308 Basic EE | 3 (3,0) |
| EE 310 Elec. Engr. Lab. | 1 (0,3) |
| EM 304 Mech. of Matr. | 3 (3,0) |
| Approved Electives | 3 (3,0) |
|                | 18              |

SENIOR YEAR

|                |                 |
| CrE 402 Solid State Ceramics | 3 (3,0) |
| CrE 407 Plant Design | 3 (1,6) |
| CrE 418 Proc. Control | 3 (3,0) |
| Geol 307 Optical Min. | 3 (2,3) |
| Approved Electives | 7 |
|                | 19              |

Elective Policy. Nine credits humanistic-social and 7 credits engineering-scientific must be chosen. Each class adviser has a list of approved electives.

CHEMICAL ENGINEERING

The graduate of the science-oriented, research-minded Chemical Engineering Department is finding intellectually stimulating and financially rewarding positions in all phases of modern industry. Because of the fundamental nature of the Chemical Engineering curriculum, the graduate is avidly sought by the newer nuclear and space-oriented industries, as well as by the equally important chemical-process industries. Indeed, the chemical engineer is in great demand in areas of technology, such as textiles, metals, aircraft, power, instrumentation, computers, foods, pulp and paper, and petroleum.

The curriculum is built upon a base of three sciences (chemistry, physics, and mathematics) with supporting courses in mechanics, electrical engineering, and materials engineering and culminates in a solid core of courses in chemical engineering. In all such courses the emphasis is upon why things happen as they do and not how;
thus, the student is taught principles that will endure and not the methods of the present or past. He is taught to realize that all material things are chemical in nature; hence, the chemical engineer in the practice of his profession may be called upon to work with anything on the face of the earth. The scope of chemical engineering is broad.

In spite of the strong scientific flavor of the Chemical Engineering curriculum, the faculty is constantly striving to impress upon the student that he is studying engineering and not pure science. The ultimate purpose of engineering is to make some practical use of scientific and engineering theories; hence, economics must always be kept in mind during the design of engineering processes or products. In brief, the chemical engineer in industry, as contrasted to the pure research scientist, is concerned that his company makes a profit.

In industry the chemical engineer may pursue one of two parallel lines of advancement. One path leads to management, and it should be noted that the top management of most chemical companies consists of former technical men. The second and equally rewarding path is in engineering research and development. In this latter category are found the men who have developed the processes and products which shape the modern world in which we live.

The Chemical Engineering Department at Clemson is housed in Earle Hall which is one of the newest and best equipped buildings for chemical engineering education in the Southeast. All members of the Chemical Engineering faculty have been educated at the doctoral level and the department offers work leading to the Master of Science and Doctor of Philosophy degrees as well as the Bachelor of Science degree.

CHEMICAL ENGINEERING CURRICULUM
(See page 159 for Freshman Year)

<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ChE 299 Digital Comp.</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td></td>
<td>ChE 204 Introd. ChE I</td>
<td>2 (1,3)</td>
</tr>
<tr>
<td></td>
<td>Ch 323 Organic Chemistry</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td></td>
<td>Engl 203 Survey of English Lit.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td></td>
<td>Math 206 Anal. Geom., Cal. III</td>
<td>4 (4,0)</td>
</tr>
<tr>
<td></td>
<td>Phys 221 Ther. &amp; Elec. Phen.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td></td>
<td>Phys 223 Gen. Phys. Lab.</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td></td>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
</tr>
<tr>
<td></td>
<td>ChE 205 Introd. to ChE II</td>
<td>3 (2,3)</td>
</tr>
<tr>
<td></td>
<td>Ch 324 Org. Chemistry</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td></td>
<td>Ch 325 Org. Chemistry Lab.</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td></td>
<td>Engl 204 Surv. of Engl. &amp; Am. Lit.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td></td>
<td>Math 208 Engr. Math. I</td>
<td>4 (4,0)</td>
</tr>
<tr>
<td></td>
<td>Phys 222 Opt. &amp; Mod. Phys.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td></td>
<td>Phys 224 Gen. Phys. Lab.</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td></td>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
</tr>
</tbody>
</table>

18 19
CIVIL ENGINEERING

Civil Engineering is the broadest in scope of the engineering professions, being the parent stem from which most of the other branches of engineering have developed. All branches of Civil Engineering rest on a comparatively compact body of principles, in which the students are thoroughly trained in the classroom, the drafting room, the laboratory, and the field. Particular effort is made to develop those qualities essential to success in any field of endeavor and to fit the graduate to become a useful citizen—a good business man as well as a successful engineer.

The practice of civil engineering involves the planning, design, construction, maintenance, and use of large structures and systems to control and improve the environment for modern civilization. The structures may serve many purposes, such as buildings for commerce and industry, bridges for transportation, vehicles for space exploration, or dams for the control and storage of water or for generation of power. The systems provide essential services: water supply; waste water treatment; rail, air, and water transportation; and systems of highways. Projects such as these require that the civil engineer be trained in the social and economic issues as well as in basic science, engineering science, and technology. Though he may specialize in a particular branch of civil engineering, such as structural or transportation, he will need some acquaintance with all subdivisions of civil engineering as well as of other branches of engineering.

The course in Civil Engineering at Clemson University leads to the degree of Bachelor of Science and is planned to equip the grad-
uate with a working knowledge of the above subjects. The student receives early drill in the basic sciences of mathematics, chemistry, and physics, and is introduced gradually to the engineering sciences and the technical courses in civil engineering. By the end of the junior year the student will have had courses in the subdivisions of structural design, fluid flow, construction materials, environmental engineering, and soil mechanics. These will enable him to choose technical electives in his senior year in the subdivision of his choice. The non-technical electives are sufficient in number to provide breadth in the arts and humanities, and assure that the graduate has a well-rounded education.

The civil engineering graduate is prepared to work immediately upon graduation in practically any of the areas or subdivisions of the profession. He may find himself in responsible charge at an early date, so every effort is made to train him at Clemson in the ethical standards demanded by the profession. All courses are directed toward the development of initiative, self-reliance, and integrity in the student.

This department also offers a Fifth-year Professional Program to graduates of the four-year program who wish additional training in economics, management, operations, and a technical specialty. This program is designed to provide the engineer who enters construction, sales, or management with a breadth of training which is not possible under the normal four-year curriculum. The construction industry is the largest in the nation and this program is particularly designed for those who enter the field of heavy construction. More details on the Fifth-year Professional Program are available from the Department of Civil Engineering.

The department is located in the Civil Engineering Building, a modern air-conditioned structure erected in 1958. The laboratories are well equipped, and the classrooms are light and conducive to study. The building has an internal television system and the 220-seat auditorium is one of the most attractive ones on the campus.

### CIVIL ENGINEERING CURRICULUM

(See page 159 for Freshman Year)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sophomore Year</strong></td>
<td><strong>Junior Year</strong></td>
</tr>
<tr>
<td>CE 201 Terrestrial Meas. I</td>
<td>CE 202 Terrestrial Meas. II</td>
</tr>
<tr>
<td>EM 201 Statics</td>
<td>CE 299 Digital Computation</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>Phys 224 Gen. Phys. Lab.</td>
</tr>
<tr>
<td>4 (3,3)</td>
<td>1 (2,1)</td>
</tr>
<tr>
<td>3 (3,0)</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>3 (3,0)</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>4 (4,0)</td>
<td>4 (4,0)</td>
</tr>
<tr>
<td>3 (0,3)</td>
<td>3 (0,3)</td>
</tr>
<tr>
<td>1 (0,3)</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>19</td>
<td>19</td>
</tr>
</tbody>
</table>
### JUNIOR YEAR

<table>
<thead>
<tr>
<th>First Semester</th>
<th></th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 308 Structural Analysis</td>
<td>4</td>
<td>CE 309 Structural Design</td>
</tr>
<tr>
<td>CE 320 Conc. &amp; Bitum. Mats.</td>
<td>2</td>
<td>CE 331 Soil Mechanics</td>
</tr>
<tr>
<td>EM 202 Dynamics</td>
<td>3</td>
<td>CE 341 Environmental Engr.</td>
</tr>
<tr>
<td>Geol 406 Engr. Geology</td>
<td>3</td>
<td>EM 320 Fluid Mechanics</td>
</tr>
<tr>
<td>Aprv. Humanistic–Social Elective‡</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>17</td>
<td></td>
</tr>
</tbody>
</table>

### SENIOR YEAR

| CrE 310 Introd. to Mat. Science                                               | 3 | CE 404 Concrete Structures                                                     |
| CE 408 Mat. & Meth. of Const.                                                | 3 | CE 411 Transport Engr.                                                         |
| Econ 201 Prin. of Economics                                                 | 3 | CE 422 Engr. Relations                                                        |
| EM 420 Hydraulic Engr.                                                      | 3 | Aprv. Humanistic–Social Electives‡                                             |
| ME 311 Engr. Thermo. I                                                       | 3 | Approved Technical Elective‡                                                   |
| Approved Technical Elective‡                                                 |   |                                                                                 |
|                                                                               | 19|                                                                                 |

‡ Each class adviser has a list of approved electives from which students must make selections. Any exception to this list must have the written approval of the department head.

### ELECTRICAL ENGINEERING

Engineering deals fundamentally with the control of the energies of nature. Electrical Engineering is that branch of engineering which embraces the conversion of primary energy into electrical form, the application of this energy to perform useful work, and the study of electrical methods of carrying out sensing, control, and communication functions.

The curriculum for students in Electrical Engineering contains a selected series of fundamental studies which enable the student to enter any division of the field of Electrical Engineering. In addition, the curriculum includes a selected group of broadening and cultural studies.

The first two years are devoted largely to basic sciences, mathematics, English, and other subjects prerequisite to a study of engineering. In the last two years the courses, although still fundamental in nature, are based upon problems encountered in the various phases of electrical engineering. A limited degree of specialization in power or electronics work is possible.

The theoretical courses in science and engineering are paralleled and reinforced by strong laboratory courses, through which the student may make his own determinations of the characteristics of engineering materials and machines and other electrical devices. The laboratories are well equipped for this work.

The entire course is directed toward the development of initiative and self-reliance, so that the student may enter his chosen field with reasonable hope of usefulness and success.

Two options are shown in the curriculum. Option X is for those students who wish to enter industry or otherwise terminate their
formal college course work after obtaining the Bachelor of Science degree. Option Y is for students who plan to go on for graduate work in some form. In general, a grade-point ratio of 2.5 or better at the end of the sophomore year is required for those who plan to follow Option Y.

Students who entered Clemson as freshmen in the summer of 1964 or later will follow the curriculum as shown. Those entering prior to this date, or transfer students who would normally expect to graduate before June 1968, will follow earlier curriculums. These are available in class advisers’ offices.

**ELECTRICAL ENGINEERING CURRICULUM**
(See page 159 for Freshman Year)

**ALL OPTIONS**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Sophomore Year</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 205 Elec. Circuits I</td>
<td>3 (3,0)</td>
<td>EE 206 Elec. Circuits II</td>
</tr>
<tr>
<td>EE 299 Digital Comp.</td>
<td>1 (0,3)</td>
<td>EE 208 Elec. Engr. Lab. I</td>
</tr>
<tr>
<td>EM 201 Statics</td>
<td>3 (3,0)</td>
<td>EM 202 Dynamics</td>
</tr>
<tr>
<td>Engl 203 Surv. of Engl. Lit.</td>
<td>3 (3,0)</td>
<td>Engl 204 Surv. of Engl. &amp; Am. Lit.</td>
</tr>
<tr>
<td>Phys 221 Ther. &amp; Elec. Phen.</td>
<td>3 (3,0)</td>
<td>Phys 222 Opt. &amp; Mod. Phys.</td>
</tr>
<tr>
<td>Phys 223 Gen. Phys. Lab.</td>
<td>1 (0,3)</td>
<td>Phys 224 Gen. Phys. Lab.</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td><strong>19</strong></td>
<td></td>
<td><strong>19</strong></td>
</tr>
</tbody>
</table>

**OPTION X**

<table>
<thead>
<tr>
<th>Junior Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 201 Prin. of Economics</td>
</tr>
<tr>
<td>EE 320 Electronics I</td>
</tr>
<tr>
<td>EE 323 Elec. &amp; Mag. Fields</td>
</tr>
<tr>
<td>EE 328 Elect. Engr. Lab. II</td>
</tr>
<tr>
<td>EE 327 Network Theory I</td>
</tr>
<tr>
<td>Math 313 Engr. Statistics</td>
</tr>
<tr>
<td>ME 311 Engr. Thermo. I</td>
</tr>
<tr>
<td><strong>19</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Senior Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 310 Intro. to Mat. Science</td>
</tr>
<tr>
<td>EE 401 Seminar</td>
</tr>
<tr>
<td>EE 408 Energy Conversion</td>
</tr>
<tr>
<td>EE 409 Elec. Engr. Lab. V</td>
</tr>
<tr>
<td>EE 410 Feedback Control Sys.</td>
</tr>
<tr>
<td>EM 320 Fluid Mech.</td>
</tr>
<tr>
<td>Approved Electives</td>
</tr>
<tr>
<td><strong>17 — 20</strong></td>
</tr>
</tbody>
</table>

*CE 422 or IE 404 may be substituted for IE 410 if necessary.

† Each class adviser has a list of approved electives from which students must select. Any exceptions to this list must be approved in writing by the department head.

Students taking advanced ROTC or AFROTC require 150 credits for graduation. Six elective credits may be used for advanced ROTC or AFROTC courses. Of the remaining 12 electives, at least three credits must be in Electrical Engineering and at least six in approved social-humanistic studies.

Non-ROTC students must take at least three credits in Electrical Engineering and at least six in approved social-humanistic studies. A total of 144 credits is required for graduation.
OPTION Y

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 201 Prin. of Economics</td>
<td>EE 312 Electromechanics</td>
</tr>
<tr>
<td>EE 320 Electronics I</td>
<td>EE 314 Elec. Engr. Lab. III</td>
</tr>
<tr>
<td>EE 323 Elec. &amp; Mag. Fields</td>
<td>EE 322 Elec. Engr. Lab. IV</td>
</tr>
<tr>
<td>EE 325 Elec. Engr. Lab. II</td>
<td>EE 324 Electronics II</td>
</tr>
<tr>
<td>EE 327 Network Theory I</td>
<td>EE 328 Network Theory II</td>
</tr>
<tr>
<td>ME 311 Engr. Thermo. I</td>
<td>ME 304 Heat Transfer I</td>
</tr>
<tr>
<td><strong>19</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Senior Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 401 Seminar</td>
</tr>
<tr>
<td>EE 403 Energy Conversion</td>
</tr>
<tr>
<td>EE 409 Elec. Engr. Lab. V</td>
</tr>
<tr>
<td>EE 410 Feedback Control Sys.</td>
</tr>
<tr>
<td>EM 320 Fluid Mech.</td>
</tr>
<tr>
<td>Phys 351 Modern Physics</td>
</tr>
<tr>
<td>Approved Electives†</td>
</tr>
</tbody>
</table>

† Each class adviser has a list of approved electives from which students must select. Any exceptions to this list must be approved in writing by the department head.

Students taking advanced ROTC or AFROTC require 150 credits for graduation. Six elective credits may be used for advanced ROTC or AFROTC courses. Of the remaining 12 electives, at least three credits must be in Electrical Engineering and at least six in approved social-humanistic studies.

Non-ROTC students must take at least three credits in Electrical Engineering and at least six in approved social-humanistic studies. A total of 144 credits is required for graduation.

INDUSTRIAL EDUCATION

The curriculum in Industrial Education has as its primary objective the preparation of students to teach a wide variety of industrial subjects. These derive their purpose from needs which the expanding industry of South Carolina and the Southeastern region demand of the industrial education teacher. Some of the subjects which these teachers are required to teach include: drawing, woodworking, metal forming, machine shop, ceramics, plastics, textiles, electricity, auto mechanics, home mechanics, etc.

The curriculum is designed to provide the student with depth of understanding to meet the above and related demands. Industrial Education and related technical core work is coupled with studies in other areas as follows: Physics and Chemistry, 16 credit hours; Mathematics, 11; Biological Science, 4; Social Sciences, 15; and English, Literature, and Arts, 15.

Industrial Education laboratory courses are conducted in one of the best equipped facilities in the country.

Employment opportunities for the graduate in Industrial Education are reflected in the increasing demand for teachers of industrial subjects. In South Carolina, for example, present demand greatly exceeds the supply of qualified teachers.

Although the primary purpose of this curriculum is teaching in the technical field of Industrial Education, opportunities in other
careers are available. Clemson can point with pride to the positions of leadership held by its Industrial Education graduates in other fields of endeavor.

**INDUSTRIAL EDUCATION CURRICULUM**

<table>
<thead>
<tr>
<th><strong>First Semester</strong></th>
<th><strong>Freshman Year</strong></th>
<th><strong>Second Semester</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 101 Engl. Composition</td>
<td>3 (3,0)</td>
<td>EG 109 Engr. Com. &amp; Design</td>
</tr>
<tr>
<td>Hist 101 American History</td>
<td>3 (3,0)</td>
<td>Engl 102 English Composition</td>
</tr>
<tr>
<td>Math 105 Algebra &amp; Trig.</td>
<td>4 (4,0)</td>
<td>Hist 102 American History</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
<td>Math 106 Anal. Geom., Cal. I</td>
</tr>
</tbody>
</table>

**Sophomore Year**

| Econ 201 Prin. of Economics         | 3 (3,0)                            | Cr Ar 101 Pottery Materials         | 3 (2,3)                            |
| EG 203 Graph. Tech. for In. Ed.     | 3 (1,6)                            | Engl 204 Surv. of Engl. & Am. Lit.  | 3 (5,0)                            |
| Engl 203 Surv. of Engl. Lit.        | 3 (3,0)                            | Gov 301 Amer. Gov. and Pol. Par.    | 3 (3,0)                            |
| In Ed 201 In. Ed. Lab.              | 2 (1,3)                            | In Ed 202 In. Ed. Lab.              | 3 (1,6)                            |
| Phys 201 Gen. Phys.                 | 3 (3,0)                            | Phys 202 Gen. Phys.                 | 3 (3,0)                            |
| Phys 203 Gen. Phys. Lab.            | 1 (0,3)                            | Phys 204 Gen. Phys. Lab.            | 1 (0,3)                            |
| Zool 101, 103 Gen. Zoology          | 4 (3,3)                            | Text 329 General Textiles           | 3 (2,3)                            |
| or Bot 101 Gen. Botany              | 4 (3,3)                            | AS or MS—Basic                      | 1 (2,1)                            |
| AS or MS—Basic                      | 1 (2,1)                            |                                      |                                    |

**Junior Year**

| Ed 302 Ed. Psychology              | 3 (3,0)                            | Ed 335 Adol. Growth & Develop.      | 3 (3,0)                            |
| EE 303 Intro. to Elec. Engr.        | 3 (3,0)                            | In Ed 303 In. Ed. Lab.              | 3 (1,6)                            |
| Engl 301 Public Speaking           | 3 (1,6)                            | In Ed 304 Equip. Maintenance        | 1 (0,3)                            |
| In Ed 301 In. Ed. Lab.              | 3 (1,6)                            | Math 303 Statistics                 | 3 (3,0)                            |
| In Ed 302 Dwell. Mat. & Const.      | 2 (1,3)                            | Soc 301 Introd. Sociology           | 3 (3,0)                            |
| Approved Elective                   | 3                                  | Approved Electives                  | 6                                  |

**Senior Year**

| Ed 406 Hist. & Phil. of Ed.         | 3 (3,0)                            | Arch 403 Intro. to Visual Arts      | 3 (3,0)                            |
| In Ed 401 In. Ed. Lab.              | 3 (1,6)                            | Ed 458 Health Education            | 3 (3,0)                            |
| In Ed 405 Tests & Measurements      | 3 (3,0)                            | In Ed 402 Directed Teaching         | 6 (1,15)                           |
| In Ed 416 Des. & Op. In. Ed. Lab.   | 3 (2,3)                            | In Ed 422 Voc. Ed. Pro.             | 3 (3,0)                            |
| In Ed 425 Tech. Indus. Subj.        | 3 (3,0)                            | Music 310 Music Appreciation        | 3 (3,0)                            |
| In Ed 441 Comp. Gen. Shop Prac.     | 2 (1,3)                            |                                      |                                    |

---

Class adviser has an up-to-date list of approved electives. Students must select their electives from this list. Any exceptions to list must be approved in writing by the department head.

**INDUSTRIAL ENGINEERING**

The creative and challenging work of the Industrial Engineer lies basically in the complex field of manufacturing systems design. The breadth and complexity of Industrial Engineering is reflected in many of its component areas of effort. These are described by such titles as: manufacturing engineering and research, quality control engineering, cost control engineering, reliability engineering, value engineering, critical path scheduling (PERT, CPM), inventory control, automation, systems simulation and optimization, operations research, etc. The body of knowledge underlying each of several of the above is of such scope as to merit national societies whose purpose is to extend understanding in the respective fields.
The physical result of the design effort of the Industrial Engineer is the ingenious manufacturing system found within the factory building. The output of these systems is reflected in innumerable products, such as automobiles, radios, cloth and clothes, typewriters, airplanes, space vehicles, furniture, locomotives, instruments, boats, bicycles, etc.

Because Industrial Engineers are in demand in all types of manufacturing, other business enterprises, construction operations, government services, hospitals, airlines, etc., the curriculum at Clemson is predicated upon providing the best possible grounding in the fundamentals of science and engineering and in the methodology that enhances their creative application. Mathematics courses are required in five of the eight semesters. Instruction in computer programming is a basic requirement. Since modern engineering and management problems require the making of increasingly difficult decisions, the curriculum incorporates a sequence of courses in methods of Operations Research. These methods bring into play powerful mathematical tools of analysis and computer application. Classroom work in Industrial Engineering is implemented by experimental studies in one of the best equipped college laboratories of its kind in the country.

Because population growth imposes a requirement of increasing demand for all types of goods, and because manufacturing systems design becomes increasingly complex, the demand for Industrial Engineers grows at a rapid rate. Not only are there highly creative technical opportunities in the field, but because the Industrial Engineer possesses a breadth of understanding of organization and operation of an enterprise, growth into management positions provides additional opportunity.

### INDUSTRIAL ENGINEERING CURRICULUM

(See page 159 for Freshman Year)

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Sophomore Year</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM 201 Statics</td>
<td>Econ 201 Prin. of Economics</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Engl 203 Surv. of Engl. Lit.</td>
<td>Engl 204 Surv. of Engl. &amp; Am. Lit.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Math 206 Anal. Geom., Cal. III</td>
<td>IE 299 Digital Computation</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>Phys 224 Gen. Phys. Lab.</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
</tr>
</tbody>
</table>

17

18
### MECHANICAL ENGINEERING

Mechanical Engineering deals largely with the production of power from prime sources of energy and the design of a wide variety of mechanisms and systems involved in the production and use of power.

The curriculum for students in Mechanical Engineering follows a sequence beginning with the basic sciences of mathematics, physics and chemistry, continuing through the engineering sciences of thermodynamics, transport phenomena, mechanics of solids and fluids, strength of materials, electrical theory, and materials science, and ending with synthesis-type courses designed to require the student to draw on his entire engineering and technological background.

The economic aspects of engineering are emphasized, and the program is conducted so as to encourage orderly habits of attack and analysis, with the main emphasis on why rather than how. Students are encouraged to develop a broad background along with their scientific and engineering education, and humanistic-social courses are an important part of the curriculum.

Mechanical Engineering graduates work with the production and application of power, in research, and in design, development, construction and application of machines, as well as in management.

The Mechanical Engineering Department offers work leading to the Master of Science and the Doctor of Philosophy degrees as well as the Bachelor of Science degree.

Students who entered Clemson as freshmen in the summer of 1964 or later will follow the curriculum as shown. Those entering prior

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Junior Year</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM 304 Mech. of Materials</td>
<td>EE 307 Basic Elec. Engr.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>EM 305 Mech. of Mat. Lab.</td>
<td>EE 309 Elec. Engr. Lab.</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>IE 301 Introd. to In. Engr.</td>
<td>EM 202 Dynamics</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>IE 304 Methods &amp; Standards</td>
<td>IE 306 Process Fund. I</td>
<td>3 (2,3)</td>
</tr>
<tr>
<td>Math 313 Engr. Statistics</td>
<td>IE 308 Ind. Applic. of Statis.</td>
<td>3 (2,3)</td>
</tr>
<tr>
<td>ME 311 Thermodynamics</td>
<td>ME 304 Heat Transfer</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>MetE 302 Gen. Metallurgy</td>
<td>Humanistic-Social Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SENIOR YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 308 Basic Elec. Engr.</td>
</tr>
<tr>
<td>EE 310 Elec. Engr. Lab.</td>
</tr>
<tr>
<td>EM 320 Fluid Mechanics</td>
</tr>
<tr>
<td>IE 412 Seminar</td>
</tr>
<tr>
<td>IE 414 Methods of O.R. I</td>
</tr>
<tr>
<td>ME 315 Kinematics of Mech.</td>
</tr>
<tr>
<td>Approved Elective</td>
</tr>
<tr>
<td>Humanistic-Social Elective</td>
</tr>
</tbody>
</table>

Each class adviser has an up-to-date list of approved electives. Students must select their electives from this list. Any exceptions to list must be approved in writing by the department head.
to this date, or transfer students who would normally expect to graduate before June 1968, will follow earlier curriculums. These are available in class advisers’ offices.

MECHANICAL ENGINEERING CURRICULUM
(See page 159 for Freshman Year)

### First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM 201 Statics</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Engl 203 Surv. of Engl. Lit.</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Math 206 Anal. Geom., Cal. III</td>
<td>4 (4.0)</td>
</tr>
<tr>
<td>ME 201 Engr. Design &amp; Prod.</td>
<td>2 (1.3)</td>
</tr>
<tr>
<td>Phys 221 Ther. &amp; Elec. Phen.</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>Phys 223 Gen. Phys. Lab.</td>
<td>1 (0.3)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2.1)</td>
</tr>
</tbody>
</table>

### Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 308 Basic Elec. Engr.</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>EE 310 Elec. Engr. Lab.</td>
<td>1 (0.3)</td>
</tr>
<tr>
<td>Math 313 Engr. Statistics</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>ME 311 Engr. Thermo. I</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>ME 315 Kinematics of Mech.</td>
<td>3 (2.3)</td>
</tr>
<tr>
<td>Humanistic-Social Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

### Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 401 Prin. of Mech. Engr. Des.</td>
<td>3 (3.0)</td>
</tr>
<tr>
<td>ME 404 Auto. Control Engr.</td>
<td>4 (3.3)</td>
</tr>
<tr>
<td>ME 411 Gas Power</td>
<td>4 (3.3)</td>
</tr>
<tr>
<td>Humanities Elective</td>
<td>3</td>
</tr>
<tr>
<td>Technical Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

**Elective Policy.** Each class adviser has a list of approved electives.

### METALLURGICAL ENGINEERING

The metallurgical engineer is concerned with the extraction of metals from their ores and with the processing of these metals to useful engineering materials. He needs a sound and thorough knowledge of chemistry, physics, and mathematics as the core around which to build his specialty. He needs training in English and foreign languages so that he may communicate his knowledge and understand what his colleagues are doing. He requires training in the humanities that he may be a good citizen. His grandfather got along with about fifteen elemental metals; he must know and use seventy-five or more. Our engineering requirements are becoming more exacting, and our opportunities to fill them greater. Nuclear fission has greatly expanded the field of metallurgical knowledge and has required much of metallurgy, as has supersonic flight and our space exploration program. There is still room for much progress in the less spectacular areas, as in the production
of cast metal parts, in heat treating, and in the intelligent selection of metals for all engineering applications.

The industrial growth of the South presents many opportunities in metallurgical work; in the production of metals, in the processing of metals, and in the sale of metals. Until very recently there has been no opportunity for adequate metallurgical training in the South. Thanks to a generous gift from the Olin Foundation, Clemson University is in a unique position to offer training with the best of laboratory facilities and equipment.

METALLURGICAL ENGINEERING CURRICULUM
(See page 159 for Freshman Year)

<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td><strong>Second Semester</strong></td>
</tr>
<tr>
<td>Engr 203 Surv. of Engl. Lit.</td>
<td>CrE 299 Digital Computation</td>
</tr>
<tr>
<td>Math 206 Anal. Geom., Cal. III</td>
<td>EM 201 Statics</td>
</tr>
<tr>
<td>MetE 202 Introduct. to Metallurgy</td>
<td>Eng 204 Surv. of Engl. &amp; Am. Lit.</td>
</tr>
<tr>
<td>Phys 221 Ther. &amp; Elec. Phen.</td>
<td>MetE 220 Extractive Metallurgy</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>Phys 224 Gen. Phys. Lab.</td>
</tr>
<tr>
<td></td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td><strong>17</strong></td>
<td><strong>19</strong></td>
</tr>
</tbody>
</table>

| Junior Year |
|-------------|----------------|
| Ch 312 Anal. Chem | ChE 331 Chem. Engr. Thermo |
| Ch 314 Anal. Chemistry Lab | Ch 332 Phys. Chemistry |
| Ch 331 Phys. Chemistry | Ch 340 Phys. Chemistry Lab |
| MetE 301 Phys. Metallurgy | MetE 304 Physical Metallurgy |
| Non-Technical Elective* | MetE 320 Mech. Metallurgy |
|                         | **19**          |

| Senior Year |
|-------------|----------------|
| CrE 410 Analytical Processes | MetE 408 Heat Treating |
| CrE 419 Science of Engr. Mats. | MetE 425 Senior Thesis |
| ChE 430 Chem. Engr. Thermo. | MetE 450 Metallic Corrosion |
| MetE 402 Metallurgical Lit. | Non-Technical Electives* |
| MetE 455 Electrometallurgy | Technical Electives* |
| Non-Technical Elective* | **17** |

* Class advisers have an up-to-date list of approved electives and will suggest course sequences. A minimum of nine credits in the humanities or social sciences must be elected. Any exception to the courses on the list must be approved by the department head.

SCHOOL OF INDUSTRIAL MANAGEMENT AND TEXTILE SCIENCE

The School of Industrial Management and Textile Science is based on the industrialization of the South, business conversions from small independents to large complexes, new sciences and techniques and the ever-growing demand for reduced costs. It is set up to help fill the ever-growing demand for graduates educated in the field of scientific management, both in general and specialized fields.
Since World War II South Carolina has been immersed in new industries—plastics, chemicals, home appliances, glass, furniture, and paper. During this time textiles has maintained its relative position of importance in the State. It continues to be twice as large as all other industries combined.

This industrialization of the South has brought a diversified and complicated production era which demands a greater supply of top quality managerial prospects.

**INDUSTRIAL MANAGEMENT**

The curriculum in Industrial Management is offered for those students who plan to follow a career associated with industry or business. The curriculum constitutes a program of basic professional education designed to prepare students for eventual managerial and administrative positions in manufacturing and commerce, or careers in the general field of business. In keeping with the increasing demands by industry for students equipped with a well-rounded education, during the first two years training in the humanities, social, and physical sciences is emphasized. During the junior and senior years the student concentrates on various basic engineering, business, economic, and technical courses designed to furnish a balanced curriculum for those entering the fields of business or industry.

**INDUSTRIAL MANAGEMENT CURRICULUM**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Freshman Year</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC 109 Engr. Com. &amp; Des.</td>
<td>3 (1,6)</td>
<td>EG 110 Engr. Com. &amp; Des.</td>
</tr>
<tr>
<td>Engl 101 English Comp.</td>
<td>3 (3,0)</td>
<td>Engl 102 Engr. Comp.</td>
</tr>
<tr>
<td>Hist 101 American History</td>
<td>3 (3,0)</td>
<td>Hist 102 American History</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
<td>AS or MS—Basic</td>
</tr>
</tbody>
</table>

18

<table>
<thead>
<tr>
<th>Sophomore Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acct 201 Prin. of Accounting</td>
</tr>
<tr>
<td>Econ 201 Prin. of Economics</td>
</tr>
<tr>
<td>Engl 203 Surv. of Engl. Lit.</td>
</tr>
<tr>
<td>IM 201 Intro. to Ind. Mgt.</td>
</tr>
<tr>
<td>Phys 201 Gen. Physics</td>
</tr>
<tr>
<td>Phys 203 Gen. Physics Lab.</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
</tr>
</tbody>
</table>

17

<table>
<thead>
<tr>
<th>Junior Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 314 Inter. Econ. Theory</td>
</tr>
<tr>
<td>IE 307 Survey of Engr.</td>
</tr>
<tr>
<td>IM 301 Cost Accounting</td>
</tr>
<tr>
<td>Math 303 Statistics</td>
</tr>
<tr>
<td>Psych 301 Gen. Psychology</td>
</tr>
<tr>
<td>Approved Elective</td>
</tr>
</tbody>
</table>

18

<table>
<thead>
<tr>
<th>Junior Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 303 Intro. to E. E.</td>
</tr>
<tr>
<td>Engl 304 Adv. Composition</td>
</tr>
<tr>
<td>IM 302 Ind. Management</td>
</tr>
<tr>
<td>IM 304 Quality Control</td>
</tr>
<tr>
<td>IM 311 Intro. to Econometrics</td>
</tr>
<tr>
<td>Soc 301 Intro. to Sociology</td>
</tr>
<tr>
<td>Approved Elective</td>
</tr>
</tbody>
</table>

21
### Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Econ 312 Commercial Law</strong></td>
<td>IM 402 Prod., Plan., and Control 3 (3,0)</td>
</tr>
<tr>
<td><strong>Engl 301 Public Speaking</strong></td>
<td>IM 403 Special Problems 2 (2,0)</td>
</tr>
<tr>
<td><strong>IE 308 Eval. &amp; Wage Incentive</strong></td>
<td>IM 404 Managerial Econ. 3 (3,0)</td>
</tr>
<tr>
<td><strong>IM 408 Work Simplif. &amp; Stand.</strong></td>
<td>Soc 405 Industrial Sociology 3 (3,0)</td>
</tr>
<tr>
<td>Approved Elective</td>
<td>Approved Elective 6</td>
</tr>
</tbody>
</table>

18 17

### Secondary Concentration

During the junior and senior years the student is required to select courses from one of the following areas for the purpose of emphasizing a particular phase of the curriculum. This constitutes 12 credits.

- A. Agricultural Economics
- B. Ceramics
- C. Economics
- D. Finance
- E. Foreign Language
- F. Regional Analysis
- G. Textile Chemistry
- H. Textiles

The student must select an additional 6 elective credits approved by his class adviser or the Dean of the School of Industrial Management and Textile Science. Students enrolled in the advanced ROTC program may use 6 credits of advanced military courses to meet this requirement.

### TEXTILE CHEMISTRY

Preparation for a future in the modern textile industry requires training in a great many areas of science. The manifold types of materials used in the textile industry; such as natural fibers, synthetic polymers, dyes, and finishing agents; necessitates a working knowledge of the fundamental concepts underlying the properties and behavior of these products along with their practical utilization.

The curriculum in Textile Chemistry is designed to accomplish this purpose by including several courses in chemistry, mathematics and physics. Courses in fiber and fabric formulation, dyeing, polymer chemistry, colloid chemistry and inorganic chemistry all related to the textile industry are offered within the department. Other areas of study include statistics, quality control and fiber science.

This should prepare the student either for work in the textile industry or for graduate study in textiles or other scientific fields depending on his elective area of study.

The Textile Department offers the Master of Science degree and, in conjunction with the Chemistry Department, the Doctor of Philosophy in chemistry with a major in Textile Chemistry.
# TEXTILE CHEMISTRY CURRICULUM

## First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 101 General Chemistry</td>
<td>4 (3,3)</td>
</tr>
<tr>
<td>EG 109 Engr. Com. and Des.</td>
<td>3 (1,6)</td>
</tr>
<tr>
<td>Engl 101 English Composition</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Math 105 Algebra and Trig.</td>
<td>4 (4,0)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>

## Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 102 General Chemistry</td>
<td>4 (3,3)</td>
</tr>
<tr>
<td>Econ 201 Prin. of Economics</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Engl 102 English Composition</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Hist 104 Western Civilization</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

## Sophomore Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 219 Chem. Prin.</td>
<td>2 (2,0)</td>
</tr>
<tr>
<td>Engl 203 Survey of Engl. Lit.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Math 205 Anal. Geom., Cal. II</td>
<td>4 (4,0)</td>
</tr>
<tr>
<td>Phys 122 Mech. and Wave Phen.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>TC 203 Textile Chemistry</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>TC 207 Textile Chem. Lab.</td>
<td>2 (0,6)</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

## Junior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ch 331 Phys. Chem.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Math 306 Ord. Diff. Equations</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Phys 222 Optics and Mod. Phys.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Phys 224 General Phys. Lab.</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>TC 315 Chem. of Fibers</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>TC 317 Synthetic Fibers Lab.</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>Text 306 Yarn Structure II</td>
<td>1 (2,3)</td>
</tr>
<tr>
<td>Approved Elective</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20</strong></td>
</tr>
</tbody>
</table>

## Senior Year

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 304 Advanced Comp.</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>TC 457 Dyeing and Finishing I</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>TC 459 Dye Lab.</td>
<td>1 (0,3)</td>
</tr>
<tr>
<td>TC 461 Seminar and Research</td>
<td>2 (0,6)</td>
</tr>
<tr>
<td>TC 475 Cellulose Chem.</td>
<td>2 (0,6)</td>
</tr>
<tr>
<td>Text 313 Fabric Structure I</td>
<td>2 (2,3)</td>
</tr>
<tr>
<td>Text 324 Textile Statistics</td>
<td>3 (3,0)</td>
</tr>
<tr>
<td>Approved Elective</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20</strong></td>
</tr>
</tbody>
</table>

Approved Electives:

Courses in the following fields (junior or senior levels) beyond those required: Textiles, Textile Chemistry, Chemistry, English, Mathematics (especially Programming the Digital Computer, Math 310), Engineering, Management, Physics, Social Sciences, Advanced Aerospace Studies or Military Science up to 6 credits.

## TEXTILES

The Textile curriculum is planned to give adequate training in the textile technological and scientific subjects.

The first two years are devoted to the basic sciences of mathematics, physics, chemistry and English.

The curriculum is designed for the student with a strong desire to enter into the manufacturing or the scientific area of the textile industry. It prepares him for research and development work as well as for positions in production, standards and management administration. The curriculum has a very strong foundation for a graduate school program.
<table>
<thead>
<tr>
<th>First Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td><strong>Second Semester</strong></td>
</tr>
<tr>
<td>Ch 101 General Chemistry</td>
<td>Ch 102 General Chemistry</td>
</tr>
<tr>
<td>EG 109 Engr. Com. and Des.</td>
<td>Engl 102 English Composition</td>
</tr>
<tr>
<td>Eng 101 English Composition</td>
<td>Hist 104 Western Civilization</td>
</tr>
<tr>
<td>Text 122 Introd. Textiles*</td>
<td>AS or MS—Basic</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
</tr>
<tr>
<td><strong>Total Credits: 15</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Econ 201 Prin. of Economics</td>
<td>Econ 202 Prin. of Economics</td>
</tr>
<tr>
<td>Text 201 Fiber Processing I</td>
<td>Text 202 Fiber Processing II</td>
</tr>
<tr>
<td>AS or MS—Basic</td>
<td>1 (2,1)</td>
</tr>
<tr>
<td><strong>Total Credits: 17</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Junior Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Phys 222 Optics and Mod. Physics</td>
<td>TC 204 Textile Chemistry</td>
</tr>
<tr>
<td>Phys 224 General Physics Lab.</td>
<td>TC 206 Textile Chemistry Lab.</td>
</tr>
<tr>
<td>TC 203 Textile Chemistry</td>
<td>Text 304 Fiber Processing IV</td>
</tr>
<tr>
<td>TC 205 Textile Chemistry Lab.</td>
<td>Text 312 Fabric Development II</td>
</tr>
<tr>
<td>Text 308 Fiber Processing III</td>
<td>Text 322 Prop. of Text. Structures</td>
</tr>
<tr>
<td>Text 311 Fabric Development III</td>
<td>Text 324 Textile Statistics</td>
</tr>
<tr>
<td>Text 321 Fiber Science</td>
<td>Approved Electives†</td>
</tr>
<tr>
<td>Approved Electives†</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits: 20</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Senior Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>IM 304 Quality Control</td>
<td>Engl 304 Adv. Composition</td>
</tr>
<tr>
<td>TC 315 Chem. of Fibers</td>
<td>IM 408 Work Simplif. and Stand.</td>
</tr>
<tr>
<td>TC 317 Syn. Fiber Lab.</td>
<td>Text 412 Fabric Development IV</td>
</tr>
<tr>
<td>Text 411 Fabric Develop. III</td>
<td>Text 422 Textile Costing II</td>
</tr>
<tr>
<td>Text 414 Knitting</td>
<td>Text 426 Instrumentation</td>
</tr>
<tr>
<td>Text 421 Textile Costing I</td>
<td>Approved Electives†</td>
</tr>
<tr>
<td>Text 423 Seminar and Research</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits: 19</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Freshmen taking Math 100 will take Text 122 in second semester; others in first semester. Freshman adviser may place students in Text 122 for second semester where he deems it advisable.

†Approved Electives:

Courses in the following fields (junior or senior levels) beyond those required: Textiles, Textile Chemistry, Chemistry, English, Mathematics (especially Programming the Digital Computer, Math 310), Engineering, Management, Physics, Social Sciences, Advanced Aerospace or Military Science up to 6 credits.
DESCRIPTION OF COURSES

This list of courses includes for each course the catalog number, title of course, credit in semester hours, class laboratory hours per week, and the description of the course. In general, courses numbered 100-199 are freshman courses, 200-299 sophomore courses, 300-399 junior courses, and 400-499 senior courses. Courses numbered 500 or above are graduate courses and are open only to students admitted to the Graduate School, except that seniors with exceptional records may be enrolled with special permission.

ACCOUNTING
MR. WANNAMAKER, MR. DAVIS, MR. SHULER

ACCT 201—PRINCIPLES OF ACCOUNTING—3 cr. (3 and 0)
Practice in handling real and nominal accounts, together with an introduction to the use of various types of books of original entry, statements of profit and loss, and balance sheets.

ACCT 202—PRINCIPLES OF ACCOUNTING—3 cr. (3 and 0)
Continuation of Acct 201 with special attention to corporation and partnership accounting with emphasis on adjustment procedures and the analysis of financial statements. Prerequisite: Acct 201.

ACCT 301—INTERMEDIATE ACCOUNTING—3 cr. (3 and 0)
A study of the accounting theory underlying the generally accepted accounting principles with emphasis on financial statements. Prerequisite: Acct 202.

ACCT 302—INTERMEDIATE ACCOUNTING—3 cr. (3 and 0)

AEROSPACE STUDIES
LIEUTENANT COLONEL FRANKLIN
MAJ. GALLIGAN, CAPT. BIGGS, CAPT. CARTER, CAPT. JOHNSON,
CAPT. NIXON, CAPT. PARKER

GENERAL MILITARY EDUCATION PROGRAM

AS 109—WORLD MILITARY SYSTEMS—1 cr. (2 and 1)
An introductory course exploring the causes of the present world conflict, the role and relationship of military power to that conflict, and the responsibility of an Air Force officer. The course begins with a discussion of the factors from which differing political philosophies have evolved. It continues with a tri-dimensional analysis of the three prime political philosophies which have guided segments of society in the twentieth century. Leadership Laboratory period provides training in drill fundamentals and leadership.

AS 110—WORLD MILITARY SYSTEMS—1 cr. (2 and 1)
A discussion and examination of the means which nations use to develop and pursue their objectives and how they confront each other in the use of these means. The course as a continuation of AS 109 then treats individual
military systems with emphasis on the U. S. Department of Defense and the U. S. Air Force. Leadership Laboratory.

AS 209—World Military Systems—1 cr. (2 and 1)
A continuation of the study of world military forces and the politico-military issues surrounding the existence of these forces. This includes a study of the U. S. Army and Navy, their doctrines, missions and employment concepts; a study of the military forces of NATO, CENTO and SEATO and their role in the free world in their attempts at collective security. Leadership Laboratory.

AS 210—World Military Systems—1 cr. (2 and 1)
A study of the military forces of the USSR, as well as an examination of the military forces of the Chinese Communists and the Soviet Satellites. This phase of World Military Systems concludes with an analysis of the trends and implications of world military power. Leadership Laboratory.

PROFESSIONAL OFFICER EDUCATION PROGRAM

AS 309—Growth and Development of Aerospace Power—3 cr. (3 and 1)
A comprehensive study of the development of the United States Air Force, its mission and organization. Also a study of the nature of conflict, the development of aerospace power into a prime security element and the modes of employment of Aerospace Forces in general war, limited war, and actions short of war. Leadership Laboratory.

AS 310—Growth and Development of Aerospace Power—3 cr. (3 and 1)
Introduction to the characteristics of the solar system and how they affect space exploration and operations. A survey of types of orbits and trajectories, along with the operating principles, characteristics, and problems associated with space vehicle systems. Leadership Laboratory.

AS 409—The Professional Officer—3 cr. (3 and 1)
A study of military professionalism, leadership and management. Covers leadership theory function and practice as employed at all staff levels. Compares leadership in the military with that in private enterprise. Flight instruction ground school training consisting of 30 hours of navigation and meteorology for FIP students. Leadership Laboratory is designed to provide advance cadets in this phase with staff experience in the guidance, direction and control of an Air Force unit.

AS 410—The Professional Officer—3 cr. (3 and 1)
A continuation in the study of professionalism with the stress in the management area. This covers management principles and functions as well as the tools, practices and controls employed in management. Problem solving is a major portion of this course wherein principles and practices in problem solving are used in the classroom. This course concludes with a bloc of instruction designed to facilitate the adjustment of these members in the transition from cadet to officer on entry into active duty in the United States Air Force. Leadership Laboratory.
AGRICULTURAL ECONOMICS

Mr. Lanham

Mr. Stepp, Mr. Bauknight, Mr. Spurlock, Mr. Todd, Mr. von Tungeln, Mr. Corley, Mr. Hubbard, Mr. Talbert

Ag Ec 202—Agricultural Economics—3 cr. (3 and 0)

An analytical survey of the various subdivisions of agricultural economics, to include farm organization, enterprise analysis, land economics, marketing, farm prices, governmental farm policies, and the relation of agriculture to the national and international economy. Prerequisite: Econ 201.

Ag Ec 302—Farm Management—3 cr. (2 and 3)

Business principles underlying the organization and operation of individual farms. Prerequisite: Ag Ec 202 and Econ 202.

Ag Ec 305—Farm Accounting—3 cr. (2 and 3)

Double-entry bookkeeping is stressed. Study is made of special journals, simplifications for farm record keeping, farm inventories, farm budgets, interpretation of financial statements, and the factor method of farm business analysis.

Ag Ec 309—Introduction to Marketing—3 cr. (3 and 0)

A general introduction to the field of marketing with emphasis on marketing functions, institutions and channels of distribution. Other subjects covered include objectives and uses of marketing research, product design, brand policy, and pricing. Attention is given to industrial products as well as agricultural commodities. Prerequisite: Econ 201.

Ag Ec 351—Advertising and Merchandising—3 cr. (3 and 0)

A general introduction to advertising and merchandising theories and some practice with basic techniques. A partial list of subjects covered includes: function of advertising, propriety in advertising, institutions, media, market research, consumer appeals, loss leaders, mass displays, trade marks and brands, writing copy, color, layout, agencies and integrated advertising campaigns. Prerequisite: Junior standing.

Ag Ec 352—Public Finance—3 cr. (3 and 0)

Principles of financing government, sources of public revenue, objects of public expenditures, problems of fiscal administration, and the application of fiscal policies in stabilizing the national economy.

Ag Ec 357—Conservation of Natural Resources—3 cr. (3 and 0)

The principles and problems involved in the conservation of soil, water, and mineral resources, with special emphasis on economic aspects of various methods of resource utilization and on the costs and benefits of various conservation practices. Prerequisite: Econ 201.

Ag Ec 361—Marketing Livestock and Livestock Products—3 cr. (3 and 0)

Steps and conditions attending the marketing of livestock and dairy products are considered. Included are selling methods; factors affecting price, production and utilization of meats; fluid milk and other dairy products; practices of buyers and packers; activities of state and federal governments; pricing policies and price determination; market news services; and psychology and preferences of consumers. Prerequisite: Junior standing.

* On leave.
AG Ec 402—ECONOMICS OF AGRICULTURAL PRODUCTION—3 cr. (3 and 0)
An economic analysis of agricultural production involving (a) the concept of the farm as a firm, (b) principles for decision making, (c) the quantitative nature and use of production and cost functions and their interrelations and application of these principles to resource allocation on farms and among areas. Prerequisite: Permission of instructor.

AG Ec 405—SEMINAR—1 cr. (1 and 0)
An examination of the relation of economics and sociology to specific problems. Prerequisite: Major in Agricultural Economics.

AG Ec 406—SEMINAR—1 cr. (1 and 0)
A continuation of AG Ec 405.

AG Ec 451—AGRICULTURAL COOPERATION—2 cr. (2 and 0)
The principles and practices of business organization and management governing the successful operation of cooperative business enterprises. Major emphasis is placed upon cooperative selling, processing, purchasing, and service enterprises that serve farm people. Prerequisite: Econ 201.

AG Ec 452—AGRICULTURAL POLICY—3 cr. (3 and 0)
A review of public agricultural policy programs in the United States and a critical examination of current and proposed government policies and programs affecting the agricultural sector of the economy. Included are economic considerations as related to past and current farm price and income problems. Prerequisite: AG Ec 202 or Econ 202.

AG Ec 456—PRICES—3 cr. (3 and 0)
A review of the basic theory of price under competitive conditions and various modifications; nature, measurement and causes of daily, seasonal and cyclical price fluctuations; geographical price relationships; nature, function and behavior of futures markets; government price programs. Prerequisite: AG Ec 202 or Econ 202.

AG Ec 460—AGRICULTURAL FINANCE—2 cr. (2 and 0)
The financial needs of agriculture and of the organization, functions and interrelationships of agencies developed to meet these needs. Prerequisite: Econ 201.

AG Ec 501—ADVANCED FARM MANAGEMENT—3 cr. (2 and 3)
AG Ec 502—ECONOMICS OF AGRICULTURAL PRODUCTION—3 cr. (3 and 0)
AG Ec 503—LAND ECONOMICS—3 cr. (3 and 0)
AG Ec 504—WATER RESOURCE POLICIES—3 cr. (3 and 0)
AG Ec 506—ECONOMIC DEVELOPMENT IN AGRICULTURAL AREAS—3 cr. (3 and 0)
AG Ec 507—AGRICULTURAL MARKETING PROBLEMS—3 cr. (3 and 0)
AG Ec 514—CONTEMPORARY ECONOMIC PROBLEMS—3 cr. (3 and 0)
AG Ec 591—THESIS RESEARCH—3 cr.
AG Ec 592—THESIS RESEARCH—3 cr.
AG Ec 610—RESEARCH PROBLEMS IN FARM MANAGEMENT—3 cr. (3 and 0)
AG Ec 611—RESEARCH PROBLEMS IN FARM MANAGEMENT—3 cr. (3 and 0)
Description of Courses

Ag Ec 616—Research Problems in Marketing—3 cr. (3 and 0)
Ag Ec 617—Research Problems in Marketing—3 cr. (3 and 0)
Ag Ec 691—Doctoral Research—Credit to be arranged.

AGRICULTURAL EDUCATION

Mr. Davis
Mr. Bowen, Mr. Kirkley, Mr. Jensen, Mr. Rodgers

Ag Ed 201—Introduction to Agricultural Education—3 cr. (2 and 3)
Principles of education, development of agricultural education, and an introduction to the formulation of instructional programs for the teaching of farm people.

Ag Ed 401—Methods in Agricultural Education—3 cr. (2 and 3)
Appropriate methods of teaching vocational agriculture in high schools. The course includes procedures for organizing teaching programs, teaching high school students, and directing F.F.A. activities.

Ag Ed 406—Directed Teaching—6 cr. (0 and 18)
Guided participation in the professional responsibilities of a teacher of vocational agriculture including an intensive study of the problems encountered and the competencies developed. A half semester of directed teaching in selected schools is required. Prerequisite: Ag Ed 401 and Ag Ed 422.

Ag Ed 422—Introduction to Adult Education—3 cr. (2 and 3)
History and nature of adult education in the United States, with emphasis on adult education for rural people.

Ag Ed 431—Methods in Conservation Education—3 cr. (3 and 0)
A study of various techniques appropriate to teaching conservation. Instruction is applicable to both elementary and high school teachers. (Offered in Summer School only.)

Ag Ed 463—Advanced Conservation Education—3 cr. (3 and 0)
The broader aspects of conservation education. The course includes historical, geographical, and national conservation problems. (Offered in Summer School only.)

Ag Ed 465—Program Development in Agricultural Education—3 cr. (3 and 0)
Each student will determine needs and resources in a specific community and plan a program to meet these needs.

Ag Ed 467—Adult Education in Agriculture—3 cr. (2 and 3)
Principles and practices appropriate to the solution of problems encountered in instructional programs for adult farmers.

Ag Ed 503—Evaluation in Agricultural Education—3 cr. (2 and 3)
Ag Ed 504—Special Problems—3 cr. (2 and 3)
Ag Ed 505—Administration and Supervision in Agricultural Education—3 cr. (3 and 0)
Ag Ed 515—Advanced Methods of Teaching Farm Mechanics—3 cr. (2 and 3)
AGEd 520—Teaching Young Farmers—3 cr. (3 and 0)
AGEd 525—Supervision of Student Teaching—3 cr. (3 and 0)
AGEd 591—Introduction to Research in Education—3 cr.
AGEd 592—Research in Agricultural Education—3 cr.

AGRICULTURAL ENGINEERING*

Mr. Snell

Mr. Wilson, Mr. Drew, Mr. Rogers, Mr. Craig, Mr. Garner, Mr. Lambert

AGE 205—Farm Shop—3 cr. (2 and 3)
Correct methods and underlying reasons in proper use and maintenance of hand and power tools are emphasized. Principal topics include: carpentry, painting and finishing, soldering and sheet metal work, farm concrete, pipe fitting and plumbing, and farm and home water supply systems.

AGE 206—Agricultural Mechanization—3 cr. (2 and 3)
The agricultural student is taught to apply physical principles and sound reasoning to the mechanization of modern agricultural production and processing enterprises. Planning efficient operational systems and wise selection of equipment, based on function and economic suitability, are stressed. Prerequisite: Math 105, Phys 201 and 203.

AGE 209—Agricultural Engineering Technology—2 cr. (1 and 3)
This course is planned to provide the agricultural engineer with the background of knowledge and techniques needed in research, development, and operations. Prerequisite: EG 109, Phys 122.

AGE 299—Digital Computation—1 cr. (0 and 3)
An introduction to digital computer programming for students majoring in Agricultural Engineering. Emphasis is placed on computer languages and their application to the solution of simple problems in agricultural engineering. Prerequisite: Sophomore standing.

AGE 301—Soil Conservation—3 cr. (2 and 3)
Engineering and agronomic principles are applied to water management in agriculture. Elementary surveying, mathematics, crops and soil fundamentals are embodied into principles and practices of erosion control, drainage, water conservation and irrigation. Prerequisite: Math 105.

AGE 352—Farm Power—3 cr. (2 and 3)
Farm tractors and stationary power units. Principles of operation, preventive maintenance, adjustment and general repair are emphasized. Prerequisite: AGEd 206.

AGE 355—Engineering Analysis and Creativity—3 cr. (2 and 3)
The principles of professional creativity and engineering analysis are applied to agricultural engineering problems. The theory of feedback control systems is studied with consideration given to the application of these controls to agricultural systems. Prerequisite: Math 208, Phys 222.

* Jointly administered by the College of Agriculture and Biological Sciences and the College of Engineering.
AcE 360—Farm and Home Utilities—3 cr. (2 and 3)
A course for seniors and graduate students in agriculture curriculums, involving a study of electric and other utilities on the farm and in the home. Selection, installation and maintenance of wiring systems, motors and controls, home water systems and sewage disposal systems are emphasized. Prerequisite: Junior standing.

AcE 362—Energy Conversion in Agricultural Systems—3 cr. (2 and 3)
The energy requirements of agricultural systems with emphasis upon energy conversion methods. Characteristics of various sources of energy will be considered including economic aspects. The present energy conversion mechanisms used in agriculture will be studied and their limitations considered. Prerequisite: EM 202, ME 311.

AcE 416—Agricultural Machinery—3 cr. (2 and 3)
Engineering analysis of machines and of basic agricultural operations and systems requiring machine functions. Static and dynamic force analyses, energy transfer, functional analysis, elements of machine design, machine and system efficiency, and economic considerations are emphasized. Prerequisite: EM 304, AcE 362, and AcE 465.

AcE 422—Soil and Water Conservation Engineering—4 cr. (3 and 3)
Physical relationships of factors governing rainfall disposition are used as bases for defining the hydrology of agricultural watersheds, which in turn serves as a basis for analysis and design of water-control structures and other conservation methods. Basic soil-water-plant relationships are used to establish criteria for determining the need of drainage and irrigation. Engineering relationships involved in the design of drainage and irrigation facilities are studied. Prerequisite: AcE 362, EM 320, CE 200, Agron 202.

AcE 431—Agricultural Structures Design—3 cr. (2 and 3)
Analytical and synthetic design of building components, including fastening devices, as determined by both live and dead loads with emphasis on statically determinant members and their positions and utilization in frames and trusses. Major materials considered are wood, steel and concrete. Prerequisite: EM 304.

AcE 442—Agricultural Process Engineering—3 cr. (2 and 3)
Design of unit operations components used in agricultural processing installations. Engineering principles and instrumentation as applied to control systems, heat transfer, materials handling, storage and related subjects are emphasized. Prerequisite: AcE 465, ME 311, EE 308, EM 320.

AcE 465—Engineering Properties of Biological Materials—3 cr. (2 and 3)
The thermal, electrical, mechanical, and chemical characteristics of biological materials, organisms, and metabolic processes are studied in relationship to engineering analysis and synthesis. The effects of environmental factors imposed by engineering processes are evaluated. Prerequisite: Math 208, Bot 352, EM 304, Zool 101, 103.

AcE 471—Research—1 cr. (0 and 3)
A course to acquaint senior students in Agricultural Engineering with the scientific method. Literature investigations, planning, and executing of an experiment are integral parts of the course. Prerequisite: Senior standing in Agricultural Engineering.
AgE 481—Fundamentals of Ginning Engineering—3 cr. (2 and 3)
An analysis of the engineering requirements and associated problems in all phases of ginning, such as handling, storage, drying, separating lint, cleaning, pressing, disposing of foreign matter, quarantine treatment, power requirements and safety precautions. Prerequisite: EM 304 or equivalent.
AgE 501—SPECIAL PROBLEMS IN AGRICULTURAL ENGINEERING—3 cr.
(3 and 0)
AgE 504—ENGINEERING APPLICATION TO AGRICULTURAL PROCESSING—3 cr.
(2 and 3)
AgE 506—INSTRUMENTATION IN AGRICULTURAL RESEARCH—3 cr. (2 and 3)
AgE 511—AGRICULTURAL POWER AND MACHINERY—3 cr. (3 and 0)
AgE 522—WATER MOVEMENT IN SOILS—3 cr. (3 and 0)
AgE 582—SYSTEMS ENGINEERING—3 cr. (2 and 3)
AgE 591—RESEARCH—3 cr.
AgE 592—RESEARCH—3 cr.

AGRICULTURE AND BIOLOGICAL SCIENCES

Mr. J. W. Jones
AgBio 101—INTRODUCTION TO AGRICULTURE AND BIOLOGICAL SCIENCES—1 cr. (1 and 0)
Guides to effectively study; agriculture and biological sciences; scope of the agricultural industry; agriculture of South Carolina and the United States; organizations and function of the land-grant institution and other agencies serving agriculture; career opportunities.

AGRONOMY

Mr. U. S. Jones
Mr. C. M. Jones, Mr. Pace, Mr. Peele, Mr. Bardsley, Mr. Craddock,
Mr. Eskew, Mr. Boling, Mr. Gossett, Mr. Jutras
Agron 102—CROP SCIENCE—3 cr. (2 and 3)
A fundamental course in crop science, including crops of the major agricultural areas of the United States and emphasizing the crops of South Carolina. Prerequisite: Bot. 101.
Agron 202—SOILS—3 cr. (2 and 3)
A basic foundation in soil science is presented with emphasis on the chemical and physical properties of soil, the activities of the living soil organisms, and the origin and classification of soils. Prerequisite: Ch 101 and 102.
Agron 301—FERTILIZERS AND MANURES—3 cr. (3 and 0)
Sources, mining and manufacture, composition, physical characteristics, and use of fertilizers and manures. A detailed study is made of crop responses to fertilizer use. Prerequisite: Agron 202.
Agron 306—FORAGE AND PASTURE CROPS—3 cr. (3 and 0)
The characteristics, establishment, utilization and maintenance of crops for hay, silage, and pasture. Crops valuable in South Carolina are emphasized. Prerequisite: Agron 102.
Agron 308—Physical and Chemical Edaphology—3 cr. (1 and 6)
The physical and chemical properties of soils and their determination in the laboratory. Special emphasis is placed on the relation of these properties to the potential fertility, management practices, and water holding capacity of soils. Prerequisite: Agron 202.

Agron 401—Advanced Crop and Seed Laboratory—1 cr. (0 and 3)
The identification of common field crop varieties, grasses, legumes, and weeds by vegetative and seed characteristics. Experience is gained in the rating of field crop varieties for important agronomic characteristics. Prerequisite: Agron 102 and 306 or consent of instructor.

Agron 403—Soil Classification—2 cr. (1 and 3)
Theoretical and practical phases of soil survey, formation and classification in relation to land usage and plant adaptability. Prerequisite: Agron 202 or consent of instructor.

Agron 405—Plant Breeding—3 cr. (2 and 3)
The application of genetic principles to the development of improved crop plants. Principal topics include the genetic and cytogenetic basis of plant breeding, mode of reproduction, techniques in selfing and crossing, methods of breeding, inheritance in the major crops, and biometrical methods. Prerequisite: Gen 302.

Agron 407—Principles of Weed Control—3 cr. (2 and 3).
Weeds, their introduction, ecology, methods of reproduction, dissemination, and control; chemistry and mode of action of herbicides, equipment and techniques of application; a characterization of the common weeds of the Southeast. Prerequisite: Agron 102, Ch 220 or equivalent.

Agron 409—Cotton and Tobacco—3 cr. (8 and 0)
History, morphology, physiology, fertilization, cultivation, insect and disease control, varieties, breeding, harvesting, grading and marketing of American Upland cotton and flue-cured tobacco. The two crops are studied separately, about half a semester being devoted to each. Prerequisite: Agron 102.

Agron 452—Soil Fertility and Management—2 cr. (2 and 0)
Principles of crop rotations, soil fertility, soil management, and other factors necessary for the practical utilization of soils. Prerequisite: Agron 202 or consent of instructor.

Agron 455—Seminar—1 cr. (1 and 0)
Student presentation of current agronomic topics of special interest in crop production appearing in recent scientific journals and other publications.

Agron 456—Seminar—1 cr. (1 and 0)
Student presentation of current topics of special interest in the field of soil science appearing in recent scientific journals and other publications.

Agron 501—Nutrition of Crops—3 cr. (3 and 0)
Agron 502—Pedology and Soil Classification—3 cr. (3 and 0)
Agron 503—Crop Production—3 cr. (3 and 0)
Agron 504—Theory and Methods of Plant Breeding—3 cr. (3 and 0)
Agron 508—Soil Fertility—3 cr. (3 and 0)
Agron 506—Special Problems—2 cr. (2 and 0)
Agron 507—Soil Physics—3 cr. (2 and 3)
Agron 508—Soil Chemistry—3 cr. (2 and 3)
Agron 525—Seminar—1 cr. (1 and 0)
Agron 591—Research—3 cr.
Agron 592—Research—3 cr.
Agron 691—Doctoral Research and Thesis—Credit to be arranged.

ANIMAL PHYSIOLOGY

Mr. Barnett, Mr. Cochran, Mr. W. A. King, Mr. Hurst, Mr. Boone, Mr. Borgman, Mr. Tombes
(See courses listed under Animal Science, Dairy Science, Poultry Science, and Zoology)

An Ph 502—Vertebrate Physiology—3 cr. (2 and 3)
An Ph 503—Animal Physiology—4 cr. (3 and 3)
An Ph 504—Animal Physiology—4 cr. (3 and 3)
An Ph 505—Pharmacology—3 cr. (2 and 3)
An Ph 691—Doctoral Research—Credit to be arranged.

ANIMAL SCIENCE

Mr. Wheeler

Mr. Godley, Mr. Ritchie, Mr. Edwards, Mr. Handlin, Mr. Skelley

An Sc 102—Animal Science—2 cr. (2 and 0)
An introductory course in Animal Science to include beef cattle, swine, poultry, dairying, horses and sheep.

An Sc 104—Animal Science Laboratory—1 cr. (0 and 3)
The judging, grading, selection and management of farm animals is given considerable emphasis. Two laboratory periods are devoted to dairy production and manufacturing and two periods to poultry.

An Sc 301—Feeds and Feeding—3 cr. (3 and 0)
Feed nutrients, digestion, metabolism of feed stuffs, nutritive ratios, feeding standards, and the balancing of rations. Prerequisite: An Sc 102, 104 and Ch 220.

An Sc 303—Feeds and Feeding Laboratory—1 cr. (0 and 3)
Practical work in mixing and balancing rations and identifying feed stuffs. Prerequisite: An Sc 102, 104 and Ch 220 or consent of instructor.

An Sc 305—Meat Grading and Selection—2 cr. (1 and 3)
Classification, grading and selection of beef, lamb and pork carcasses and wholesale cuts. Factors influencing quality and value. Students enrolled in this course are eligible to compete in Intercollegiate Meat Judging Contests. Prerequisite: An Sc 102, 104.
An Sc 306—Judging—2 cr. (1 and 3)
Selection, breed characteristics and grading of beef cattle, sheep and swine. Students enrolled in this course are eligible to compete in the Southeastern Intercollegiate Livestock Judging Contest. Prerequisite: An Sc 102, 104.

An Sc 353—Meats—1 cr. (1 and 0)
The chemical and physical composition of meat, meat hygiene; nutritive value; curing; freezing; and meat by-products. Prerequisite: An Sc 102, 104.

An Sc 355—Meats Laboratory—2 cr. (0 and 6)
The selection and grading of meat animals and carcasses. Practical work in slaughtering of animals and in the cutting, curing and freezing of meats. Emphasis is placed on the identification of wholesale and retail cuts. Prerequisite: An Sc 102, 104.

An Sc 401—Beef Production—3 cr. (3 and 0)
Breeding, feeding, management and grading of beef cattle. Emphasis is placed on year-round grazing. Prerequisite: An Sc 301.

An Sc 403—Beef Production Laboratory—1 cr. (0 and 3)
Practical application of beef production practices. Prerequisite: An Sc 301.

An Sc 405—Advanced Judging—1 cr. (0 and 3)
A continuation of An Sc 306 for students who are interested in participating in judging contests or in receiving special training in the selection of breeding cattle, sheep and swine. Judging and grading of market classes are considered. Prerequisite: An Sc 306.

An Sc 406—Seminar—2 cr. (2 and 0)
Special problems in animal production. Each student is given a subject on which he makes weekly reports before a seminar group. Prerequisite: An Sc 301.

An Sc 407—Horse and Sheep Production—2 cr. (2 and 0)
The breeding, feeding and care of horses and sheep; the shearing and marketing of sheep and wool; the adaptability of breeds; and parasite and disease control. Prerequisite: An Sc 301.

An Sc 408—Pork Production—3 cr. (3 and 0)
Feeding, breeding, management, and marketing of hogs. Emphasis is placed on winter and summer forages, protein supplements, mineral mixtures, and sanitation practices. In laboratory grading, selection, feeding, management and care of swine is given attention. Prerequisite: An Sc 301.

An Sc 409—Horse and Sheep Production Laboratory—1 cr. (0 and 3)
Horse and sheep production practices. Prerequisite: An Sc 301.

An Sc 410—Pork Production Laboratory—1 cr. (0 and 3)
Practical application of swine production practices. Prerequisite: An Sc 301.

An Sc 452—Animal Breeding—3 cr. (3 and 0)
The fundamental principles relating to the breeding and improvement of livestock including variation, heredity, selection, linebreeding, inbreeding, cross-breeding and other related subjects. Prerequisite: Gen 302.

An Sc 502—Topical Problems—1-3 cr. (1-3 and 0)
An Sc 503—Meat Technology—3 cr. (3 and 0)
An Sc 504—Methods in Animal Breeding—3 cr. (3 and 0)
An Sc 505—Nutrition of Meat Animals—3 cr. (3 and 0)
An Sc 591—Research—3 cr.
An Sc 592—Research—3 cr.

ARCHITECTURE

Mr. McClure
Mr. Gunnin, Mr. Means, Mr. Coolidge, Mr. Hodges, Mr. Hunter,*
Mr. Marshall, Mr. Young, Mr. Acorn, Mr. Kaufman, Mr. Pinckney,
Mr. Reep, Mr. Regnier, Mr. Rogers, Mr. Sappenfield, Mr. Russo,
Mr. Craig, Mr. Howe, Mr. Morris

ARCH 103—Environmental Technology I—2 cr. (1 and 3)
The principles of graphic representation, mathematical procedures related to
architecture, and the use of the slide rule.

ARCH 104—Environmental Technology II—2 cr. (1 and 3)
The solution of site planning and topographical problems. Prerequisite: Arch
103.

ARCH 105—Visual Arts—2 cr. (0 and 6)
Basic studio work in drawing and related media.

ARCH 106—Visual Arts—2 cr. (0 and 6)
Basic studio work in painting and related media. Prerequisite: Arch 105.

ARCH Const 141—Elements of Building I—4 cr. (2 and 6)
An introduction to the principles of building construction. Emphasis is placed
on fundamental types, materials, and methods of building construction.

ARCH Const 142—Elements of Building II—4 cr. (2 and 6)
A continuation of Arch Const 141. Prerequisite: Arch Const 141.

ARCH 151—Basic Design Course Group—5 cr. (1 and 12)
Studio problems in visual fundamentals, including principles of graphic and
three dimensional representation. Adjunct lectures and exercises in architectural
theory and basic construction are included in the content of the course group.

ARCH 152—Beginning Architectural Design Course Group—5 cr.
(1 and 12)
Studio problems in elements of architecture, including principles of graphic
and three dimensional representation. Lectures and exercises in architectural
theory and basic construction are continued. Prerequisite: Arch 151 with C
standing.

ARCH 205—Visual Arts—2 cr. (0 and 6)
Studio working in painting and related media. Prerequisite: Arch 106.

ARCH 206—Visual Arts—2 cr. (0 and 6)
Continuation of Arch 205. Prerequisite: Arch 205.

ARCH Const 241—Elements of Building III—4 cr. (2 and 6)
Interpretation and analysis of working drawings and specifications of selected
building projects. Principles of estimating procedures with emphasis on quantity
survey techniques. Lectures employed for building projects studied. Prere-
quisite: Arch Const 142.

* On leave.
ARCH Const 242—Elements of Building IV—4 cr. (2 and 6)
Continuation of Arch Const 241. Prerequisite: Arch Const 241.

ARCH 251—Architectural Design Course Group—6 cr. (1 and 15)
The design of small buildings with attention to man's functional needs, aesthetics and simple structural analysis. Studio problems and related lectures. Prerequisite: Arch 152 with C standing.

ARCH 252—Architectural Design Course Group—6 cr. (1 and 15)
Continuation of Arch 251. Prerequisite: Arch 251 with C standing.

ARCH 305—Visual Arts—2 cr. (0 and 6)
Principles of printmaking and solution of studio problems in printmaking. Prerequisite: Arch 205.

ARCH 306—Visual Arts—2 cr. (0 and 6)
Continuation of Arch 305. Prerequisite: Arch 305.

ARCH 307—Visual Arts—2 cr. (0 and 6)
Studio work in sculpture and related media. Prerequisite: Arch 106.

ARCH 308—Visual Arts—2 cr. (0 and 6)
Continuation of Arch 307. Prerequisite: Arch 307.

ARCH 309—Architectural History I—2 cr. (2 and 0)
The architectural history of Western man from 15000 B.C. to A.D. 323, with particular attention to Mesopotamia, Egypt, Greece, and the Roman Empire.

ARCH 310—Architectural History II—2 cr. (2 and 0)
The architectural history of Europe and the Near East from A.D. 323 to 1453, with particular attention to the Byzantine, pre-Romanesque, Romanesque, and Gothic schools of Western Europe. Prerequisite: Arch 309.

ARCH Const 341—Building Construction—4 cr. (2 and 6)
A study of building projects of intermediate size and complexity with emphasis on job planning and control, problems of superintendence and scheduling. Prerequisite: Arch 242.

ARCH Const 342—Building Construction—4 cr. (2 and 6)
A continuation of Arch Const 341 with emphasis on construction equipment, contractor's plant and maintenance program.

ARCH 351—Architectural Design Course Group—7 cr. (1 and 18)
The design of buildings of intermediate complexity with special attention to detail and development. Studio problems and related lectures. Prerequisite: Arch 252 with C standing.

ARCH 352—Architectural Design Course Group—7 cr. (1 and 18)
Continuation of Arch 351. Prerequisite: Arch 351 with C standing.

ARCH 403—Introduction to the Visual Arts—3 cr. (3 and 0)
A consideration of man's necessity for and production of the Visual Arts with particular attention to the environmental factors in society which demand art and a study of the techniques employed by artists. Illustrated lectures and collateral reading. Not open, except by special permission, to students in the School of Architecture. Sections will be limited to 40 students. Preference to students in Education. Prerequisite: Junior standing.
ARCH 405—Visual Arts—2 cr. (0 and 6)
Advanced studio work in painting. Prerequisite: Fourth-year standing; Arch 106.

ARCH 406—Visual Arts—2 cr. (0 and 6)
Continuation of Arch 405. Prerequisite: Arch 405.

ARCH 407—Industrial Design—2 cr. (1 and 3)
The design of objects for everyday living, including presentation by drawing and model. Prerequisite: Third-year standing in Architecture or special permission.

ARCH 408—Industrial Design—2 cr. (1 and 3)
Continuation of Arch 407. Prerequisite: Arch 407.

ARCH 411—History of Arts—3 cr. (3 and 0)
Seminar in Arts History and criticism limited to some particular movement or period. Open to students in the School of Architecture with third-year standing and to other students of the University who have completed Arch 403 with a grade of “B” or better.

ARCH 412—History of Arts—3 cr. (3 and 0)
Continuation of Arch 411. Prerequisite: Arch 411.

ARCH 413—Architectural History III—2 cr. (2 and 0)
The architectural history of Western Europe and the Americas from 1453 to 1775, with particular attention to the Renaissance, Baroque, and Revivalist schools. Prerequisite: Arch 310.

ARCH 414—Architectural History IV—2 cr. (2 and 0)
The architectural history of Western Europe and the Americas from 1775 to 1915 with particular attention to the architecture of the Industrial Revolution and the development of the academies. Prerequisite: Arch 413.

ARCH 415—Structural Methods—2 cr. (2 and 0)
A lecture course relating concrete and steel structural systems to contemporary considerations of function, aesthetics and economics. A special study is made of building codes and other regulations. Prerequisite: Fourth-year standing.

ARCH Const 441—Building Construction—4 cr. (2 and 6).
A study of complex building projects with emphasis on contractor’s business organization. Prerequisite: Arch Const 342.

ARCH Const 442—Building Construction—4 cr. (2 and 6)
A continuation of Arch Const 441 with emphasis on builder’s insurance, labor and sub-contractor relations. Prerequisite: Arch Const 441.

ARCH Const 443—Construction Management—7 cr. (2 and 15)
A study of building contractor’s office, management, banking, financing and purchasing procedure. A special study of legal, ethical and personnel problems is made. Prerequisite: Arch Const 442.

ARCH Const 444—Building Construction Thesis—7 cr. (2 and 15)
The selection and development of a thesis of appropriate scope, conducting necessary research, programming and presentation. Prerequisite: Arch Const 441.
Arch 451—Architectural Design Course Group—8 cr. (2 and 18)
The programming and solution of complex building design problems, including interior and site development and Contract Documents. Prerequisite: Arch 352 with C standing.

Arch 452—Architectural Design Course Group—8 cr. (2 and 18)
Continuation of Arch 451. Prerequisite: Arch 451 with C standing.

Arch 453—Advanced Architectural Construction—4 cr. (1 and 9)
The methods, materials, and details involved in the construction of a complex multi-storied building. Prerequisite: Fourth-year standing.

Arch 475—Mechanical Plant—2 cr. (2 and 0)
The water supply, plumbing, heating and ventilating systems of present-day buildings.

Arch 476—Mechanical Plant—2 cr. (2 and 0)
Air-conditioning, electrical systems, lighting, mechanical transportation and acoustics as applied to contemporary buildings. Prerequisite: Arch 475.

Arch 480—Architectural Office Practice—2 cr. (2 and 0)
General consideration of architectural office procedure. Study of the professional relationship of the architect to client and contractor, including problems of ethics, law, and business.

Arch 481—Architectural Office Practice—2 cr. (2 and 0)
A continuation of Arch 480. Prerequisite: Arch 480.

Arch 491—Architectural and Town Planning Design—11 cr. (5 and 18)
Lectures and studio problems in advanced architectural design and Town Planning. Course content will include pre-thesis studies. Prerequisite: Arch 452 with C standing.

Arch 492—Architectural Thesis—11 cr. (5 and 18)
The student working individually will carefully program an environmental problem of appropriate scope, and conduct his own comprehensive research. He will make a complete oral, written and visual presentation of his solution. Prerequisite: Arch 491.

Arch 493—Structural Thesis Research—5 cr. (0 and 15)
Studio and laboratory research studies preliminary to undertaking a thesis in Architectural Structures. Prerequisite: Arch 453.

Arch 494—Thesis in Architectural Structures—11 cr. (5 and 18)
The student working individually with laboratory and lecture support will prepare and present a structural thesis of appropriate scope and complexity. Prerequisite: Arch 493.

Arch 511—History Seminar I—3 cr. (3 and 0)
Arch 512—History Seminar II—3 cr. (3 and 0)
Arch 515—Structural Seminar I—3 cr. (2 and 3)
Arch 516—Structural Seminar II—3 cr. (2 and 3)
Arch 551—Planning and Housing Seminar I—3 cr. (2 and 3)
Arch 552—Planning and Housing Seminar II—3 cr. (2 and 3)
Arch 561—Graduate Architectural Design—9 cr. (3 and 18)
Arch 592—Graduate Thesis—9 cr. (3 and 18).
BACTERIOLOGY

Mr. Epps

Mr. Rush

Mr. Bond

Bact 301—General Bacteriology—4 cr. (3 and 3)
Morphology, physiology, classification, distribution, and cultivation of microorganisms; effects of organisms on their environment; microorganisms and health. Prerequisite: Bot 101 or Zool 101 and 103; Ch 101; Ch 102.

Bact 312—Food Microbiology—3 cr. (2 and 3)
The microbiology of natural and processed foods. The nature of microorganisms involved in food processing, food spoilage, and food poisoning. Methods of isolating, enumerating and identifying these organisms are conducted in the laboratory. Prerequisite: Bact 301.

Bact 401—Advanced Bacteriology—4 cr. (2 and 6)
Metabolism, nutrition, growth, and death of bacteria; microbiological assays and industrial fermentation; emphasis on laboratory procedures for the identification of the more common taxonomic groups. Prerequisite: Bact 301; Ch 220 or 323 and 327.

Bact 402—Dairy Bacteriology—3 cr. (2 and 3)
Morphology, physiology and culturing of microorganisms of importance in dairy products; standard methods for the determination of numbers of bacteria, yeasts, and molds in various dairy products. Prerequisite: Bact 301.

Bact 406—Sanitary Bacteriology—3 cr. (2 and 3)
The relation of bacteria to water purification and sewage disposal. Methods of water analysis, water purification, and sewage disposal are investigated in the laboratory. Public health aspects are stressed. Prerequisite: Bact 301.

Bact 410—Soil Microbiology—3 cr. (2 and 3)
The role of microorganisms in the decomposition of organic substances; transformation of nitrogen and mineral substances in the soil; interrelationships between higher plants and soil microorganisms; importance of microorganisms in soil fertility. Prerequisite: Bact 301.

Bact 411—Pathogenic Bacteriology—3 cr. (2 and 3)
A study of pathogenic bacteria, their morphology, cultural requirements and classification; diagnostic tests, methods of differentiation, and the diseases caused. Prerequisite: Bact 301.

Bact 501—Bacterial Taxonomy—3 cr. (2 and 3)
Bact 502—Bacteriology Technic—4 cr. (2 and 6)
Bact 503—Special Problems in Bacteriology—2 cr.
Bact 505—Physiology of Bacteria—3 cr. (2 and 3)
Bact 510—Soil Microbiology—3 cr. (2 and 3)
Bact 591—Research—3 cr.
Bact 592—Research—3 cr.
194 Description of Courses

BIOCHEMISTRY
Mr. W. P. Williams
Mr. Mitchell, Mr. Borgman, Mr. Turk, Mr. H. O. Wheeler
(See biochemistry courses listed under Chemistry, page . . . )
Bioch 503—Intermediary Metabolism I—4 cr. (3 and 3)
Bioch 504—Intermediary Metabolism II—4 cr. (3 and 3)
Bioch 506—Biochemistry of Nutrition—3 cr. (3 and 0)
Bioch 508—Biochemistry of Nutrition Laboratory—2 cr. (0 and 6)
Bioch 510—Advanced Biochemical Techniques and Preparations—3 cr. (1 and 6)

BIOLOGY
(See Biology Curriculum, page 134)
Biol 450—Biology for High School Teachers—3 cr. (3 and 0)
The fundamental principles of biological processes are reviewed and expanded. Demonstrations, preparations, illustrations, and experiments suitable for use in high school teaching are emphasized. Expressly designed for biology teachers in the secondary schools.

Biol 500—Principles of Biology—3 cr. (2 and 3)

BOTANY
Mr. Epps
Mr. Mathews, Mr. Rutledge, Mr. Whitney, Mr. Ashworth, Mr. Halpin,
Mr. Witcher, Mr. Alexander, Mr. Kingsland
Bot 101—General Botany—4 cr. (3 and 3)
The form, structure and physiology of the higher plants, followed by the algae, bacteria, fungi, liverworts, mosses and ferns, with the application of the biological laws. Descriptions, life histories and adaptation of representative organisms.

Bot 352—Plant Physiology—4 cr. (3 and 3)
The relations and processes which have to do with the maintenance, growth and reproduction of plants, including absorption of matter and energy, water relations of the plant, utilization of reserve products and liberation of energy. Prerequisite: Bot 101; Ch 101 and 102; Phys 201 and 203 or Phys 211 and 213.

Bot 355—Histology—2 cr. (0 and 6)
The principles of fixing, cutting and staining plant tissues and the various other processes of micro-technique and their application to specific forms of plants. Prerequisite: Bot 101; Ch 101 and 102.

Bot 356—Taxonomy—3 cr. (1 and 6)
The identification, classification, distribution and interrelationship of flowering plants with emphasis on the flora of South Carolina. Prerequisite: Bot 101.

Bot 401—Plant Pathology—3 cr. (2 and 3)
The major plant diseases of the South, their symptoms and control and the nature of the causal agents or factors. Prerequisite: Bot 101.
Bot 402—ECONOMIC BOTANY—3 cr. (2 and 3)
Plants and plant products and their relationship to human history and contemporary life. Sources of plant products, especially those outside the scope of courses in Agronomy and Horticulture. Prerequisite: Bot 101 or permission of the instructor.

Bot 404—CYTOLOGY—4 cr. (3 and 3)
A detailed consideration of the morphology and ultrastructural of cells. Prerequisite: Bot 101, Zool 101, 103, and permission of instructor.

Bot 405—FOREST PATHOLOGY—3 cr. (2 and 3)
Symptoms and causative agents of forest tree diseases; their prevention and control; their relation to silviculture, management, and utilization of forests. Prerequisite: Bot 101.

Bot 406—PLANT ANATOMY—3 cr. (2 and 3)
The origin and development of the organs and tissue systems of vascular plants and a comparative study of the structure of roots, stems, leaves, flowers, and fruits. Prerequisite: Bot 101.

Bot 451—MORPHOLOGY OF THE FUNGI—3 cr. (2 and 3)
The morphology and taxonomy of the fungi, with special emphasis on species of economic importance. Prerequisite: Bot 101.

Bot 452—PLANT ECOLOGY—3 cr. (3 and 0)
The fundamental principles of the relations between plants and their environment. Prerequisite: Bot 101.

Bot 455—PLANT MORPHOLOGY—4 cr. (2 and 6)
The structure of vegetative and reproductive parts of plants representing the major plant groups except bacteria and fungi. Prerequisite: Bot 101.

Bot 456—PLANT VIROLOGY—3 cr. (3 and 0)
Plant viruses with emphasis on their morphology, biochemistry, purification, and transmission; symptoms resulting from virus infections; virus-vector relationships; and serological procedures. The importance and control of virus diseases of plants will be discussed. Prerequisite: Bot 401 or Bot 405 or permission of instructor.

Bot 502—MYCOLOGY—4 cr. (3 and 3)

Bot 503—PLANT PATHOLOGY—4 cr. (3 and 3)

Bot 504—PHYSIOLOGY OF PARASITISM IN PLANTS—3 cr. (3 and 0)

Bot 505—SPECIAL PROBLEMS IN BOTANY—Credit to be arranged

Bot 506—CONTROL OF PLANT DISEASES—3 cr. (3 and 0)

Bot 511—INORGANIC METABOLISM—4 cr. (3 and 3)

Bot 512—ORGANIC PLANT METABOLISM—3 cr. (3 and 0)

Bot 513—PLANT GROWTH AND DEVELOPMENT—3 cr. (3 and 0)

Bot 514—MICROBIAL PHYSIOLOGY—3 cr. (3 and 0)

Bot 591—RESEARCH—3 cr.

Bot 592—RESEARCH—3 cr.

Bot 691—DOCTORAL RESEARCH—Credit to be arranged
CERAMIC ARTS
Mr. Robinson, Mr. Fain

Cr Ar 101—Pottery Materials—3 cr. (2 and 3)
The occurrence and properties of pottery raw materials. Attention is devoted
to the occurrence of natural pottery materials in South Carolina, and the
methods and equipment used in preparing these materials.

Cr Ar 102—Pottery Drying and Firing—3 cr. (3 and 0)
The drying and firing processes used in pottery making. A discussion is
included on the design and construction of simple pottery kilns and the student
is required to build and operate a small outdoor kiln. The laboratory work
demonstrates the drying and firing behavior of pottery.

Cr Ar 301—Pottery Glazes—3 cr. (3 and 0)
The materials and methods used in preparing glazes and a study of the
methods used in decorating pottery products. Prerequisite: Cr Ar 101 and 102.

Cr Ar 401—Advanced Pottery—3 cr. (2 and 3)
The student is given advanced training in pottery techniques and pottery
equipment. Prerequisite: Cr Ar 101 and 102.

CERAMIC ENGINEERING
Mr. Robinson
Mr. Wilson, Mr. Hulbert, Mr. Fain, Mr. Lefort

CrE 201—Introduction to Ceramic Engineering—2 cr. (2 and 0)
An introduction to ceramic engineering together with a study of ceramic
forming operation. Exercises are provided in the analysis of processing prob-
lems, the evaluation of background information and the creation of new solu-
tions to processing problems.

CrE 202—Ceramic Materials—3 cr. (3 and 0)
The properties and uses of commonly used ceramic materials. Equilibrium
diagrams are used to gain an understanding of the effect of heat on the
materials.

CrE 204—Laboratory Procedures—1 cr. (0 and 3)
An introduction to ceramic laboratory procedures. Primary consideration will
be given to the evaluation of sources of error and significance of measurement
in the major ceramic test procedures.

CrE 299—Digital Computation—1 cr. (0 and 3)
An introduction to digital computer programming for students majoring in
Ceramic Engineering. Emphasis is placed on the computer languages in use
at Clemson University, and their application to the solution of simple problems
in ceramic engineering. Prerequisite: Sophomore standing.

CrE 302—Thermo-Chemical Ceramics—3 cr. (3 and 0)
High-temperature equilibrium using the laws of physical chemistry as applied
to ceramic systems in both solid and liquid states. An introduction to the
crystal chemistry of ceramic raw materials, and the effect of crystalline form
on their high-temperature behavior.
**CrE 303—Ceramic Products—2 cr. (2 and 0)**
The application of ceramic products to a variety of use environments. Refractories, structural ceramics, coated metals and corrosion resistant products are included. The course is for both engineering and now-engineering majors.

**CrE 304—Experiment Design—1 cr. (0 and 3)**
An exercise in the planning and organization of experiments in the ceramic field.

**CrE 306—Fuels Combustion and Heat Transfer—1 cr. (0 and 3)**
Combustion devices, the calculation of combustion problems and heat transfer.

**CrE 307—Thermal Processing of Ceramics—3 cr. (3 and 0)**
The accomplishment of changes in structure and composition through the application of thermal energy. The course includes a study of simultaneous transfer of heat and mass, fluid flow, determinants of rates in a variety of reactions and calculation of the energy requirements to accomplish change in structure or composition.

**CrE 309—Research Methods—2 cr. (0 and 6)**
The planning and solution of selected research problems.

**CrE 310—Introduction to Material Science—3 cr. (3 and 0)**
A beginning course in material science designed primarily for engineering students. The course is a study of the relation between the electrical, mechanical and thermal properties of products and the structure and composition of these products. All levels of structure are considered from gross structures easily visible to the eye through electronic structure of atoms.

**CrE 402—Solid State Ceramics—3 cr. (3 and 0)**
The effects of the composition, form, and shape of ceramic raw materials on the manufacturing processes and final properties of ceramic products. Included are fundamental studies of such phenomena as deflocculation, plasticity, sintering and the behavior of ceramic products in electrical circuits. **Prerequisite:** Junior standing.

**CrE 403—Glasses—3 cr. (3 and 0)**
Glass structure and composition and their relation to the properties of glasses. Consideration is given to the processing variables which control the properties of glasses including glass products, enamels, glazes and vitreous bonds.

**CrE 404—Enamels—3 cr. (3 and 0)**
The raw materials, methods of manufacture, and properties of porcelain enamel coatings for metals. **Prerequisite:** CrE 302.

**CrE 406—Ceramic Project—2 cr. (0 and 6)**
The completion of an original research into a ceramic problem. **Prerequisite:** CrE 302.

**CrE 407—Plant Design—3 cr. (1 and 6)**
The application of the fundamentals of ceramic engineering to problems in plant design. **Prerequisite:** Senior standing in Ceramic Engineering.

**CrE 410—Analytical Processes—3 cr. (3 and 0)**
An introductory course on the theory and use of X-ray diffraction and spectroscopic methods. **Prerequisite:** Junior standing.
CrE 412—Raw Material Preparation—3 cr. (3 and 0)
The equipment and processes used in the crushing and grinding of raw materials, the separation and classification of particle sizes, and the separation and purification of minerals by mineral dressing methods.

CrE 416—Electronic Ceramics—3 cr. (3 and 0)
The theory and measurement of the electronic properties of ceramic products.

CrE 418—Process Control—3 cr. (3 and 0)
Process control techniques and apparatus with particular emphasis on temperature measurement and control systems. The application of laboratory techniques to the control of product quality and process efficiency is included. Prerequisite: Junior standing.

CrE 419—Science of Engineering Materials—3 cr. (3 and 0)
This course is planned to acquaint engineers with the thermal, electrical, and chemical characteristics of engineering materials. It emphasizes fundamental consideration of the structure of matter in the solid and glassy states, solid state reactions, and the influence of particle and aggregate structure to speed of reaction and product properties. The reasons for the properties of materials at elevated temperatures and room temperatures are related to these fundamentals.

CrE 420—Science of Engineering Materials—3 cr. (3 and 0)
A continuation of CrE 419 with emphasis on applications of fundamentals in nuclear reactors and nuclear power plants. Consideration is given to the development of ceramics for fuel elements, moderator materials, control rods, shielding and in radioactive waste disposal.

CrE 502—Solid State Ceramic Science—3 cr. (3 and 0)
CrE 503—Thermal Properties of Ceramic Materials—3 cr. (3 and 0)
CrE 504—Mechanical Properties of Ceramic Materials—3 cr. (3 and 0)

CrE 505—Magnetic and Electrical Ceramic Materials—3 cr. (3 and 0)

CrE 506—Ceramic Coatings—3 cr. (3 and 0)
CrE 507—Specialized Ceramics—3 cr. (3 and 0)
CrE 509—High-Temperature Materials—3 cr. (3 and 0)
CrE 510—Ceramic Engineering Thermodynamics—3 cr. (3 and 0)
CrE 511—Ceramic Engineering Kinetics—3 cr. (3 and 0)
CrE 512—Current Topics in Ceramic Engineering—1 cr. (1 and 0)
CrE 513—Nuclear Ceramics—3 cr. (3 and 0)
CrE 514—Ceramic Physical Processing—3 cr. (3 and 0)
CrE 515—Colloidal and Surface Science—3 cr. (3 and 0)
CrE 516—Constitution and Structure of Glasses—3 cr. (3 and 0)
CrE 521—Analytical Procedures and Equipment I—3 cr. (2 and 3)
CrE 522—Analytical Procedures and Equipment II—3 cr. (2 and 3)
CrE 523—Thermal Properties of Ceramic Materials—3 cr. (3 and 0)
CrE 524—MECHANICAL PROPERTIES OF CERAMIC MATERIALS—3 cr. (3 and 0)
CrE 525—MAGNETIC AND ELECTRICAL CERAMIC MATERIAL—3 cr. (3 and 0)
CrE 526—CERAMIC COATINGS—3 cr. (3 and 0)
CrE 528—SOLID STATE CERAMIC SCIENCE—3 cr. (3 and 0)
CrE 591—RESEARCH—3 cr.
CrE 592—RESEARCH—3 cr.

CHEMICAL ENGINEERING

Mr. Littlejohn
Mr. Harshman, Mr. Meenaghan, Mr. Alley, Mr. Barlage,
Mr. Bruley, Mr. Beckwith

ChE 204—INTRODUCTION TO CHEMICAL ENGINEERING I—2 cr. (1 and 3)
Designed to acquaint students with the profession of Chemical Engineering and to introduce them to certain basic concepts and methods used by the chemical engineer. Topics include the chemical engineering literature, graphical methods of presenting data, graphical solutions to problems, fundamental units and dimensions, process variables, stoichiometry, and PVT relations for gases. Prerequisite: Ch 102 and Math 205.

ChE 205—INTRODUCTION TO CHEMICAL ENGINEERING II—3 cr. (2 and 3)
A continuation of ChE 204. Topics include properties of mixtures of gases and vapors, material and energy balances, equilibria in chemical systems, dimensional analysis, economic considerations, and an introduction to stagewise calculations involving solvent extraction. Prerequisite: ChE 204, Math 206, and Phys 221.

ChE 299—DIGITAL COMPUTATION—1 cr. (0 and 3)
An introduction to machine computation with the digital computer. The student is exposed to basic programming using problems from chemical engineering.

ChE 301—UNIT OPERATIONS THEORY I—3 cr. (3 and 0)
The general principles of Chemical Engineering and a study of the following unit operations: Fluid Flow, Fluid Transportation, Heat Transmission and Evaporation. Special emphasis is placed on theory and its practical application to design. Prerequisite: ChE 205, and Junior standing.

ChE 302—UNIT OPERATIONS THEORY II—3 cr. (3 and 0)
A study of selected unit operations based on diffusion. Both stagewise and differential contacts are studied for gas absorption, distillation, and gas-liquid contact operations. Prerequisite: ChE 301 and Junior standing.

ChE 306—UNIT OPERATIONS LABORATORY I—1 cr. (0 and 3)
Laboratory work in the unit operations of fluid flow, heat transfer, and evaporation. Stress is laid on the relation between theory and experimental results and on report writing. Prerequisite: ChE 301 and Junior standing.

ChE 307—ANALOG COMPUTATION—1 cr. (0 and 3)
An introduction to the theory and application of electronic analog computers. Prerequisite: Math 208.
CHE 331—CHEMICAL ENGINEERING THERMODYNAMICS I—3 cr. (3 and 0)
A first basic course in static equilibria. Topics include the First and Second Law of Thermodynamics, real and ideal gases, thermodynamic properties of fluids, phase changes, and heats of reaction. Prerequisite: Ch 331, Math 208, and Junior standing; or permission of the Department Head.

CHE 401—TRANSPORT PHENOMENA—3 cr. (3 and 0)
Heat, mass, and momentum transport with emphasis being laid on how the three processes are related. A firmer theoretical foundation is laid for the previous work in unit operations. Prerequisite: ChE 302 and Senior standing.

CHE 407—UNIT OPERATIONS LABORATORY II—2 cr. (0 and 6)
Laboratory work for the diffusional unit operations. Competent technical reports are required. Prerequisite: Enrollment in ChE 401 and Senior standing.

CHE 408—CHEMICAL ENGINEERING DESIGN I—1 cr. (1 and 0)
An introduction to equipment and plant design with emphasis being placed on economic considerations. Prerequisite: ChE 302 and Senior standing.

CHE 409—CHEMICAL ENGINEERING DESIGN II—2 cr. (0 and 6)
Study of the design of a chemical plant involving such factors as process to be employed, equipment selection, specification writing and cost accounting, and plant location. Prerequisite: ChE 401, 488, and 430; Senior standing, or permission of the Department Head.

CHE 410—UNIT OPERATIONS THEORY III—2 cr. (2 and 0)
The theory of flow through porous media, mixing, particle mechanics, and comminution. Prerequisite: Senior standing.

CHE 411—CHEMICAL ENGINEERING LIBRARY MATERIALS—1 cr. (0 and 3)
The use of the technical literature in the solution of chemical engineering problems is stressed. Prerequisite: Completion of all required 300-numbered courses in chemistry and chemical engineering and Senior standing.

CHE 412—DEVELOPMENT LABORATORY—2 cr. (0 and 6)
The investigation of a research or development project in Chemical Engineering. Competent reports are required. Prerequisite: ChE 401, 407, 411, 430, and Senior standing or permission of the Department Head.

CHE 415—INTRODUCTION TO NUCLEAR ENGINEERING—3 cr. (3 and 0)
Designed to acquaint the non-nuclear engineer with some of the engineering aspects of nuclear science. Topics include a brief survey of particle physics; nuclear reactions; energy transformations; nuclear reactors, their design, construction and use; radiation damage to materials of construction; and special problems in nuclear engineering peculiar to the basic engineering disciplines. Prerequisite: Junior or Senior standing in Engineering, Chemistry or Physics.

CHE 416—INTRODUCTION TO NUCLEAR ENGINEERING—3 cr. (3 and 0)
A continuation of ChE 415; topics to include reactor principles, plutonium production, reactor types, materials of reactor construction, control instruments, and waste disposal. Prerequisite: ChE 415.

CHE 423—THEORY OF BIO-OXIDATION PROCESSES—2 cr. (2 and 0)
Designed to cover the basic biochemical principles underlying bio-oxidation and their applications in activated sludge and trickling filter processes; basic theory of oxygen transfer and its application to the design of aeration equip-
Chemical Engineering 201

ment; and the design and operation of typical industrial waste treatment processes. \textit{Prerequisite:} Ch 331 or permission of instructor.

\textbf{ChE 425—Chemical Process Engineering—3 cr. (3 and 0)}

An advanced treatment of chemical engineering unit operations and unit processes. The course is designed to give the undergraduate more depth in these areas. \textit{Prerequisite:} Permission of the instructor.

\textbf{ChE 430—Chemical Engineering Thermodynamics II—3 cr. (3 and 0)}

A continuation of ChE 331. Subjects include heat engines, compressors, refrigeration, phase equilibria and chemical reaction equilibria. \textit{Prerequisite:} ChE 331 and Senior standing.

\textbf{ChE 450—Chemical Engineering Kinetics—3 cr. (3 and 0)}

An introduction to the kinetics of chemical reactions. Topics include homogeneous and heterogeneous reactions, batch and flow reaction systems, catalysis, and design of industrial reactors. \textit{Prerequisite:} ChE 430 or permission of the Department Head.

\textbf{ChE 452—Molecular and Turbulent Transport—3 cr. (3 and 0)}

A theoretical treatment of the fundamental mechanisms of molecular and turbulent heat, mass, and momentum transport with the major emphasis given to the interrelation of all three mechanisms. Evaluation and correlation of transport properties and both steady state and unsteady state processes are considered. An elective course for non-chemical engineering students. \textit{Prerequisite:} Senior standing in Chemistry, Engineering, or Physics, and Math 208.

\textbf{ChE 453—Analysis of Automatic Process Control—3 cr. (3 and 0)}

Basic process control and the effect of feedback in various systems. The mathematical analysis of the dynamic response of process systems to step and sinusoidal changes. Determination of the optimum settings for various combinations of proportional, reset and derivative control. \textit{Prerequisite:} Junior or Senior standing in Engineering, Physics, or Chemistry, and Math 208.

\textbf{ChE 503—Heat, Mass, and Momentum Transfer—3 cr. (3 and 0)}

\textbf{ChE 504—Chemical Engineering Thermodynamics—3 cr. (3 and 0)}

\textbf{ChE 505—Chemical Engineering Kinetics—3 cr. (3 and 0)}

\textbf{ChE 506—Chemical Engineering Calculations I—3 cr. (3 and 0)}

\textbf{ChE 507—Chemical Engineering Calculations II—3 cr. (3 and 0)}

\textbf{ChE 508—Chemical Engineering Design and Analysis—3 cr. (1 and 6)}

\textbf{ChE 509—Waste Treatment—3 cr. (3 and 0)}

\textbf{ChE 510—Biochemical Engineering—3 cr. (3 and 0)}

\textbf{ChE 520—Unit Operations—3 cr. (3 and 0)}

\textbf{ChE 521—Unit Operations—3 cr. (3 and 0)}

\textbf{ChE 522—Unit Operations—3 cr. (3 and 0)}

\textbf{ChE 523—Unit Operations—3 cr. (3 and 0)}

\textbf{ChE 530—Chemical Technology—3 cr. (3 and 0)}

\textbf{ChE 540—Graduate Laboratory—3 cr. (0 and 9)}

\textbf{ChE 545—Selected Topics in Chemical Engineering—3 cr. (3 and 0)}
Description of Courses

ChE 546—Selected Topics in Chemical Engineering—3 cr. (3 and 0)
ChE 547—Selected Topics in Chemical Engineering—3 cr. (3 and 0)
ChE 552—Air Pollution Control Processes—3 cr. (3 and 0)
ChE 553—Industrial Air Hygiene—3 cr. (3 and 0)
ChE 591—Research—3 cr.
ChE 592—Research—3 cr.
ChE 603—Air Pollution Control Processes—3 cr. (3 and 0)
ChE 604—Chemical Engineering Thermodynamics—3 cr. (3 and 0)
ChE 605—Chemical Engineering Kinetics—3 cr. (3 and 0)
ChE 645—Selected Topics in Chemical Engineering—3 cr. (3 and 0)
ChE 646—Selected Topics in Chemical Engineering—3 cr. (3 and 0)
ChE 647—Selected Topics in Chemical Engineering—3 cr. (3 and 0)
ChE 691—Doctoral Research and Dissertation—Credit to be arranged

CHEMISTRY

Mr. Brownley

Mr. Dinwiddie, Mr. Hobson, Mr. Hunter, Mr. Polk, Mr. Huffman,
Mr. Lindstrom, Mr. Salley, Mr. Spencer, Mr. Allen, Mr. Bailey,
Mr. Bishop, Mrs. Bishop, Mr. Brown, Mr. Fanning,
Mr. Hodges, Mr. Landers, Mr. Marullo

Ch 101—General Chemistry—4 cr. (3 and 3)

Gives the student a general knowledge of the fundamentals of the science of chemistry through lectures, lecture experiments, and laboratory exercises. Consideration is given to the common substances.

Ch 102—General Chemistry—4 cr. (3 and 3)

A continuation of Ch 101.

Ch 181—General Chemistry—4 cr. (3 and 3)

Same as Ch 101 except that this honors section is open to students only by invitation.

Ch 182—General Chemistry—4 cr. (3 and 3)

Continuation of Ch 181. Open only by invitation.

Ch 219—Chemical Principles—2 cr. (2 and 0)

The fundamental laws and theories pertaining to water and its solutions. The nature of chemical equilibria present in aqueous solutions is emphasized. Prerequisite: Ch 101 and 102.

Ch 220—Elementary Organic Chemistry—4 cr. (3 and 3)

A one semester course in organic chemistry. Typical classes of organic compounds, both aliphatic and aromatic, are studied. Prerequisite: Ch 101 and 102.

Ch 310—Agricultural Biochemistry—4 cr. (3 and 3)

An introductory course consisting of a review of equilibrium reactions; a study of the chemistry of carbohydrates, proteins, and lipids, and their role in
cell metabolism. The laboratory work parallels classroom study. **Prerequisite:** Organic Chemistry.

**Ch 312—Analytical Chemistry—3 cr. (3 and 0)**  
The fundamental principles of analytical chemistry with emphasis on stoichiometry. This course designed primarily for chemical engineers.

**Ch 314—Analytical Chemistry Laboratory—1 cr. (0 and 3)**  
The standard techniques of analytical chemistry—gravimetric, volumetric, and instrumental. **Prerequisite:** Enrollment in Ch 312.

**Ch 316—Quantitative Analysis—5 cr. (3 and 6)**  
The fundamental principles of analytical chemistry and application of these principles in the laboratory. Volumetric and certain instrumental and gravimetric procedures are employed. **Prerequisite:** Ch 101 and 102 and Organic Chemistry.

**Ch 318—Quantitative Analysis—3 cr. (3 and 0)**  
Covers the theory only of Ch 316 and is designed primarily for graduate students in other departments. **Prerequisite:** Ch 101 and 102 and permission of the instructor.

**Ch 323—Organic Chemistry—3 cr. (3 and 0)**  
An introductory course covering the principles of organic chemistry and the derivation of these principles from a study of the properties, preparations, and interrelationships of the important classes of organic compounds. **Prerequisite:** Ch 101 and 102.

**Ch 324—Organic Chemistry—3 cr. (3 and 0)**  
A continuation of Ch 323.

**Ch 325—Organic Chemistry Laboratory—2 cr. (0 and 6)**  
The laboratory techniques involved in the synthesis, separation and purification, and characterization of typical examples of the classes of organic compounds. **Prerequisite:** Registration in Ch 323.

**Ch 326—Organic Chemistry Laboratory—2 cr. (0 and 6)**  
A continuation of Ch 325. **Prerequisite:** Registration in Ch 324.

**Ch 327—Organic Chemistry Laboratory—1 cr. (0 and 3)**  
The synthesis and properties of typical examples of the classes of organic compounds. **Prerequisite:** Registration in Ch 323.

**Ch 328—Organic Chemistry Laboratory—1 cr. (0 and 3)**  
A continuation of Ch 327. **Prerequisite:** Registration in Ch 324.

**Ch 330—Introduction to Physical Chemistry—4 cr. (4 and 0)**  
Presents topics in physical chemistry which are of special interest to students in agriculture, the biological sciences, and pre-medicine. Included will be chemical thermodynamics, equilibrium, solutions, kinetics, electrochemistry, and surface phenomena. It is suggested that the student take Ch 339 concurrently. **Prerequisite:** One semester of calculus.

**Ch 331—Physical Chemistry—3 cr. (3 and 0)**  
Includes the gaseous state, thermodynamics, chemical equilibria, and atomic and molecular structure, from both experimental and theoretical points of view. **Prerequisite:** Math 206 and Physics.
CH 332—Physical Chemistry—3 cr. (3 and 0)
Continuation of Ch 331 including chemical kinetics, liquid and solid state, phase equilibria, solutions, electrochemistry and surfaces.

CH 333—Physical Chemistry Laboratory—2 cr. (0 and 6)
Experiments designed to illustrate the physical chemistry theory studied in Ch 331. Prerequisite: Registration in Ch 331.

CH 334—Physical Chemistry Laboratory—2 cr. (0 and 6)
A continuation of Ch 333. Prerequisite: Registration in Ch 332.

CH 339—Physical Chemistry Laboratory—1 cr. (0 and 3)
Experiments are selected to be of maximum value to Chemical Engineering majors. Prerequisite: Registration in Ch 331.

CH 340—Physical Chemistry Laboratory—1 cr. (0 and 3)
A continuation of Ch 339. Prerequisite: Registration in Ch 332.

CH 402—Inorganic Chemistry—3 cr. (3 and 0)
A comprehensive survey of the field of inorganic chemistry through lectures and lecture experiments. Development of modern theories of atomic structure and valence, and a detailed study of the elements and their compounds, based on the periodic system and including both well-known and rarer elements. Prerequisite: Ch 331 and 332.

CH 411—Instrumental Analysis—4 cr. (2 and 6)
Demonstration and operation of modern optical and electronic precision measuring devices as they apply to the processes and analytical, physical and organic chemistry. Prerequisite: Physical Chemistry.

CH 421—Qualitative Organic Analysis—4 cr. (2 and 6)
Systematic identification of pure organic compounds and mixtures. Prerequisite: Organic Chemistry.

CH 423—General Biochemistry—3 cr. (3 and 0)
A review of the basic organic chemistry of the amino acids, saccharides, and fatty acids; relations of these acids to the chemistry of proteins, polysaccharides, and lipids. Study of kinetics of enzymes and nucleic acids. Metabolic pathways of amino acids, carbohydrates, fats, phospholipids, and nucleic acids; hormonal control of metabolism, vitamins, and growth factors. Prerequisite: Ch 323 and 324.

CH 424—General Biochemistry—3 cr. (3 and 0)
A continuation of Ch 423.

CH 425—General Biochemistry Laboratory—1 cr. (0 and 3)
Experiments selected to illustrate current methods used in biochemical research.

CH 426—General Biochemistry Laboratory—1 cr. (0 and 3)
A continuation of Ch 425.

CH 431—Atomic and Molecular Structure—3 cr. (3 and 0)
An introductory study of the principles of wave mechanics, hydrogen atom structure, approximate methods, molecular orbital and valence bond treatments of bonding, hybridization, ligand-field theory, and relationships of structure to physical and chemical properties.
CH 441—Glass Manipulation—2 cr. (0 and 6)
A course designed to teach the fundamentals of glass manipulation and its application to the construction and repair of simple laboratory apparatus. Prerequisite: Senior standing.

CH 442—Chemical Literature—1 cr. (1 and 0)
This course is designed to give the student practice in the use of chemical literature, the writing of technical reports and the presentation of same before the faculty of the Department of Chemistry. Prerequisite: Junior standing in Chemistry.

CH 443—Research Problems—3 cr. (0 and 9)
Original investigation of an assigned problem in a fundamental branch of Chemistry. This work must be carried out under the supervision of a member of the staff. Prerequisite: Senior standing in Chemistry.

CH 444—Research Problems—3 cr. (0 and 9)
A continuation of Ch 443.

CH 450—Review of General Chemistry I—3 cr. (3 and 0)
A lecture course designed to deal with the basic principles generally presented in a general chemistry course. Emphasis will be placed upon the explanation of observed facts in terms of modern atomic and molecular structure.

CH 454—Inorganic Synthesis—2 cr. (0 and 6)
A laboratory course designed to acquaint the student with various methods and techniques employed in the preparation and handling of inorganic compounds.

CH 472—Organic Synthesis—4 cr. (2 and 6)
A course designed to teach the student techniques and principles as applied in a research laboratory. Both macro and semi-micro methods are used in the preparation of several organic compounds. Prerequisite: Organic Chemistry.

CH 491—Introduction to Radiochemistry—3 cr. (2 and 3)
The natural and synthetic radioisotopes, including the consideration of atomic and nuclear structure, properties of radiation and tracer techniques and their application. The laboratory is concerned with the methods of detection and measurement of the various types of radiation and the various applications of tracer techniques. Prerequisite: Senior or Graduate standing and permission of instructor.

CH 505—Inorganic Chemistry—3 cr. (3 and 0)
CH 506—Special Topics in Inorganic Chemistry—1 to 4 cr.
CH 507—Coordination Chemistry—3 cr. (3 and 0)
CH 508—Chemistry of the Non-Metallic Elements—3 cr. (3 and 0)
CH 511—Analytical Chemistry—3 cr. (3 and 0)
CH 512—Chemical Spectroscopic Methods—3 cr. (2 and 3)
CH 521—Organic Chemistry I—3 cr. (3 and 0)
CH 522—Organic Chemistry II—3 cr. (3 and 0)
CH 523—Organic Reaction Mechanisms—3 cr. (3 and 0)
Ch 524—Fundamental Principles of Polymer Chemistry—3 cr. (3 and 0)
Ch 525—Current Topics in Organic Chemistry—1 cr. (1 and 0)
Ch 526—Chemistry of Enzymes—3 cr. (3 and 0)
Ch 529—Chemistry and Metabolism of Carbohydrates—2 cr. (2 and 0)
Ch 531—Chemical Thermodynamics—3 cr. (3 and 0)
Ch 532—States of Matter—3 cr. (3 and 0)
Ch 534—Statistical Thermodynamics—3 cr. (3 and 0)
Ch 535—Chemical Kinetics—3 cr. (3 and 0)
Ch 536—Topics in Colloid Science—3 cr. (3 and 0)
Ch 537—Quantum Chemistry—3 cr. (3 and 0)
Ch 541—Atomic and Molecular Structure—3 cr. (3 and 0)
Ch 550—A Review of General Chemistry II—3 cr. (2 and 3)
Ch 551—Chemistry Seminar—0 to 2 cr.
Ch 552—Chemistry Seminar—0 to 2 cr.
Ch 591—Research—3 cr.
Ch 592—Research—3 cr.
Ch 621—Heterocyclic Compounds—3 cr. (3 and 0)
Ch 622—Stereochemistry—3 cr. (3 and 0)
Ch 623—Chemistry of Natural Products—3 cr. (3 and 0)
Ch 624—Chemistry of Natural Products—3 cr. (3 and 0)
Ch 625—Current Trends in Organic Chemistry—1 cr. (1 and 0)
Ch 630—Advanced Physical Chemistry I—3 cr. (3 and 0)
Ch 631—Advanced Physical Chemistry II—3 cr. (3 and 0)
Ch 650—Microanalytical Techniques—3 cr. (1 and 6)
Ch 691—Doctoral Research—Credit to be arranged

CIVIL ENGINEERING

Mr. Moore

Mr. Rich, Mr. Trively, Mr. Andrews, Mr. Ford, Mr. McCormac,
Mr. McCutchen, Mr. Rostron, Mr. Abernathy, Mr. Antrim,
Mr. Sack, Mr. Schwartz

CE 200—Elementary Surveying—2 cr. (1 and 3)
Introduction to all basic surveying instruments. Field work and computations for simple plane surveys. For non-Civil Engineering students only. Prerequisite: Math 105.

CE 201—Terrestrial Measurements I—4 cr. (3 and 3)
Introduction to instruments; theory and practical work in plane surveying; differential leveling; chaining; stadia; Latitudes and Departures; areas, partition of land; computation of missing sides; contours; topographic mapping; plane
Civil Engineering 207

table; astronomical observations. Prerequisite: Math 106 or permission of instructor.

CE 202—TERRESTRIAL MEASUREMENTS II—3 cr. (2 and 3)
Vertical and Horizontal curves; borrow pit volumes; route surveying; earthwork; triangulation; by-passing obstacles; introduction to photogrammetry and use of electronic methods of measuring distances. Prerequisite: CE 201.

CE 203—TOPOGRAPHIC SURVEYING AND MAPPING—1 cr. (0 and 3)
Field and office work necessary to make a complete topographic map, including contours of a prescribed area. For non-Civil Engineering students only. Prerequisite: CE 200.

CE 299—DIGITAL COMPUTATION—1 cr. (0 and 3)
The fundamental operations and writing of detailed programs for digital electronic computers, with applications to Civil Engineering areas. The course is elementary and not designed for just a single or particular computer, although emphasis is placed on the computer languages applicable to the computers present in the computer laboratory. Prerequisite: Enrollment in or credit for CE 201.

CE 308—STRUCTURAL ANALYSIS—4 cr. (3 and 3)
Analytical analysis of statically determinate beams, trusses, and frames, including the construction of shear and moment diagrams, influence lines, and thorough discussion of moving loads. Computation of slopes and deflections of beams by area-moment and conjugate beam methods. Analysis of statically indeterminate beams and one-story frames by moment distribution and slope deflection. Prerequisite: EM 304.

CE 309—STRUCTURAL DESIGN—4 cr. (3 and 3)
Design and detail of components and connections for timber and metal structures. Prerequisite: CE 308.

CE 320—CONCRETE AND BITUMINOUS MATERIALS—2 cr. (1 and 3)
Investigation and selection of aggregates for Portland cement concrete and asphaltic concrete; latest methods of design of Portland cement mixes and asphaltic concrete mixes; field control and adjustments; field trips to nearby construction jobs. Prerequisite: EM 304 and Junior standing.

CE 331—SOIL MECHANICS—3 cr. (2 and 3)
Mechanical and physical properties of soils and their relation to soil action in problems of engineering, such as classification, permeability, shearing strength, consolidation, stress distribution and bearing capacity of soils. Prerequisite: EM 304 and Junior standing.

CE 341—ENVIRONMENTAL ENGINEERING—3 cr. (3 and 0)
An evaluation of the effects of the environment on man with special consideration given to air and water contacts. The analysis and review of engineering systems used in Environmental Control. Prerequisite or Concurrent: EM 320, EM 322.

CE 404—CONCRETE STRUCTURES—4 cr. (3 and 3)
Design and detail of reinforced concrete members using the elastic and ultimate strength theories. Introduction to prestressed concrete. Prerequisite: CE 308 and Senior standing.
CE 408—MATERIALS AND METHODS OF CONSTRUCTION—3 cr. (3 and 0)
A survey of the principal materials, methods and equipment used in the
construction industry. Prerequisite: Senior standing.

CE 411—TRANSPORTATION ENGINEERING—3 cr. (3 and 0)
Elements of design, location and construction of highways, railroads, airports
and other transportation facilities, including a study of the various paving and
roadbed materials, earthwork operations, soil and drainage problems involved
in such construction. Planning and administration of various transportation
systems. Prerequisite: CE 331, CE 320.

CE 416—STRUCTURAL DESIGN—4 cr. (3 and 3)
Design and detail of the components of wood, steel and concrete structures.
For non-Civil Engineering students only. Prerequisite: CE 308.

CE 419—GENERAL PHOTOGRAMMETRY—3 cr. (2 and 3)
Fundamentals of mapping by the use of aerial photographs; characteristics,
production and use of aerial photographs; study of the operation of popular
photogrammetric instruments including aerial cameras, stereoscopic viewing
and plotting equipment; practice in the use of stereocomparagraph and multi-
plex plotting instruments; scale, tilt, and coordinate calculations; construction
of photomosaics. Prerequisite: CE 202 and Senior standing.

CE 422—ENGINEERING RELATIONS—3 cr. (3 and 0)
Business, legal and ethical relations in engineering practice. Prerequisite:
Econ 201 and Senior standing.

CE 431—APPLIED SOIL MECHANICS—3 cr. (2 and 3)
Relationship of local geology to soil formations, ground water, planning of
site investigation, sampling procedures, laboratory determination of design
parameters, foundation design and settlement analysis. Prerequisite: CE 331,
Geol 406.

CE 434—CONSTRUCTION COSTS AND ESTIMATES—3 cr. (2 and 3)
Interpretation of specifications and plan reading necessary for the proper
estimation of quantities of materials and costs of engineering structures. The
course is presented from both the designer's and the constructor's viewpoint
in order to fit the young engineer with the essential details an inspector or a
construction engineer should have at his command. Prerequisite: Senior standing.

CE 435—ENGINEERING PROJECT ANALYSIS—3 cr. (2 and 3)
Advanced analysis of engineering projects. Theory of economic, financial,
and intangible analysis of large-scale construction projects. Practical exercises
in cost-benefit studies and construction decisions. Prerequisite: Permission of
instructor.

CE 441—WATER RESOURCES ENGINEERING—3 cr. (2 and 3)
The hydrologic and economic considerations involved in the control and
utilization of water; analysis and design of water and waste water collection
systems and water distribution systems. Prerequisite: CE 341, EM 320 and
EM 322.

CE 442—WATER AND WASTE TREATMENT TECHNOLOGY—3 cr. (2 and 3)
Theory and control of the physical, chemical and biological processes em-
ployed in water and waste water treatment. Prerequisite: CE 341 and Senior
standing.
CE 453—Advanced Structural Analysis—3 cr. (3 and 0)
Slopes and deflections of beams and trusses by energy methods. Analysis of
statically indeterminate structures and construction of influence lines by virtual-
work method. Application of moment distribution and slope deflection methods
to haunched beams. Prerequisite: CE 308 and Senior standing.

CE 490—Special Projects—1-3 cr. (1-3 and 0-0)
Studies or laboratory investigations on special topics in the Civil Engineering
field which are of interest to individual students and staff members. Arranged
on a project basis with a maximum of individual student effort and a minimum
of staff guidance. Prerequisite: Senior standing.

CE 501—Structural Engineering I—3 cr. (2 and 3)
CE 502—Structural Engineering II—3 cr. (2 and 3)
CE 503—Model Analysis—3 cr. (2 and 3)
CE 504—Theory and Design of Thin Plates—3 cr. (3 and 0)
CE 505—Theory and Design of Thin Shells—3 cr. (3 and 0)
CE 510—Highway Safety and Traffic Control—2 or 3 cr. (2 and 0)
or (3 and 0)

CE 511—Highway Design—3 cr. (3 and 0)
CE 512—Bituminous Paving Materials—3 cr. (2 and 3)
CE 513—Highway and Airport Pavement Design—3 cr. (3 and 0)
CE 519—Highway Research—2 to 4 cr.
CE 520—Concrete Mixes and Materials—3 cr. (2 and 3)
CE 531—Soil Engineering—3 cr. (2 and 3)
CE 532—Advanced Soil Mechanics—4 cr. (3 and 3)
CE 533—Physical and Physio-chemical Properties of Soils—4 cr.
(3 and 3)
CE 541—Sanitary Engineering Analysis—3 cr. (2 and 3)
CE 542—Sanitary Engineering Processes—3 cr. (3 and 0)
CE 543—Unit Operations of Sanitary Engineering—3 cr. (3 and 0)
CE 544—Unit Processes Laboratory—1 cr. (0 and 3)
CE 545—Unit Operations Laboratory—1 cr. (0 and 3)
CE 546—Pollution of the Aquatic Environment—3 cr. (2 and 3)
CE 547—Selected Topics in Water Resources Engineering—3 cr.
(3 and 0)

CE 589—Special Problems I—1-3 cr.
CE 590—Special Problems II—1-3 cr.
CE 591—Research—3 cr.
CE 592—Research—3 cr.
CE 691—Doctoral Research—Credit to be arranged.
DAIRY SCIENCE

MR. KING
MR. HURST, MR. BRANNON, MR. HENNINGSON, MR. JANZEN,
MR. LAZAR, MR. CHALUPA

DY Sc 201—Introductory Dairyring—3 cr. (2 and 3)
Designed to give a working knowledge of Dairy husbandry and dairy products. Studies include history of dairying, dairy breeds, feeds and feeding, judging dairy animals, dairy farm buildings, quality milk production, testing milk and some of its products, the manufacture of milk products and the value of milk and milk products.

DY Sc 304—Sensory Evaluation Techniques—2 cr. (1 and 3)
Fundamental aspects of sensory techniques employed in the quality evaluation of food products. A survey of methods employed in product evaluation and acceptance. A concept of quality is formed through examination of various grades of each product. Actual practice in the selection and operation of taste panels illustrates their use in the food industry.

DY Sc 305—Dairy Technology and Engineering—3 cr. (2 and 3)
Major subjects covered are physical and chemical properties of milk, power transmission, electrical power and equipment, hydraulics and pumping, heat measurement and control, steam and its use in the dairy, principles of refrigeration, insulation and cold storage rooms, heaters and coolers, storage tanks, ice cream freezers, homogenizers, pasteurizers, concentrators, equipment maintenance and plant design.

DY Sc 306—The Chemical and Physical Nature of Milk—3 cr. (2 and 3)
The nature and properties of the major and minor constituents of milk, the effect of chemical and physical treatment on milk constituents, and analytical methods necessary to determine the composition and properties of milk and its constituents. The philosophy and development of quality control.

DY Sc 307—Market Milk—3 cr. (2 and 3)
Composition, procurement, processing, distribution, quality control, public health aspects, basis chemistry and bacteriology of industrial milk supplies and cultured products.

DY Sc 310—Dairy Cattle Selection—1 cr. (0 and 3)
Emphasis is placed upon the selection of dairy cattle for profitable herd operations. Evaluations of herd classifications, fitting, showing, and true type are made.

DY Sc 402—Dairy Manufactures—4 cr. (3 and 3)
The principles and practice of the manufacture of ice cream and related dairy products, the principles of the manufacture of condensed and evaporated milks and milk powders, and the physical, chemical and biological factors involved.

DY Sc 403—Animal Nutrition—3 cr. (3 and 0)
A basic understanding of the chemistry and physiology of digestion and metabolism of carbohydrates, lipids, proteins, minerals and vitamins by farm animals. The effects of antibiotics and other additives are included. Maintenance, growth, reproduction and lactation are studied in relation to the physiological requirements. Prerequisite: Ch 220.
Dairy Science 211

DY Sc 404—Dairy Plant Management—3 cr. (2 and 3)
The functions and operations of the dairy and food processing plant including the application of labor relations, business management, business law and plant efficiency. Prerequisite: Dy Sc 305.

DY Sc 407—Cheese and Butter Manufacture—3 cr. (2 and 3)
Theory and practice of the manufacture, curing and marketing of Blue, Cheddar, Swiss and other cured cheeses. Principles and practices of creamery buttermaking with emphasis on butter plant management. Students will become familiar with grading, neutralizing, pasteurizing, and churning cream.

DY Sc 409—Dairy Science Seminar—2 cr. (2 and 0)
Special research problems in production and manufactures are studied. Individual topics not fully covered in class work are assigned for special report before class and some members of Dairy Science Staff. Prerequisite: Senior standing.

DY Sc 410—Dairy Science Seminar—2 cr. (2 and 0)
A continuation of Dy Sc 409 with emphasis on current research literature and research methods. Prerequisite: Senior standing.

DY Sc 452—Dairy Cattle Feeding and Management—3 cr. (2 and 3)
Fundamental principles in the care, feeding, and management of dairy cattle of all ages. Topics include general considerations in selecting a breed and the individual cow, calf raising, growth and development of dairy heifers, care and management of the milking herd and feeding for milk production.

DY Sc 453—Animal Reproduction—3 cr. (3 and 0)
Basic reproductive physiology in cattle, sheep, and swine. Emphasis will be placed on factors affecting fertility and sterility.

DY Sc 455—Animal Reproduction Laboratory—1 cr. (0 and 3)
This course will supplement Dy Sc 453. Practical work will include the collection, evaluation, and processing of semen; artificial insemination of animals; and the completion of a breeding project with rats. Prerequisite: To be taken concurrently or to follow Dy Sc 453.

DY Sc 501—Topical Problems—1 to 3 cr.
DY Sc 502—Genetics of Dairy Cattle Improvement—3 cr. (3 and 0)
DY Sc 503—Physiology of Reproduction and Milk Secretion—3 cr. (3 and 0)
DY Sc 504—Endocrinology—3 cr. (3 and 0)
DY Sc 505—Newer Knowledge of Dairy Nutrition—3 cr. (3 and 0)
DY Sc 507—Fermented Dairy Products—3 cr. (2 and 3)
DY Sc 508—Industrial Dairy Science—3 cr. (3 and 0)
DY Sc 509—Rumen Metabolism—3 cr. (2 and 3)
DY Sc 591—Research—3 cr.
DY Sc 592—Research—3 cr.
ECONOMICS

Mr. Hill, Mr. Macaulay, Mr. Whitten, Mr. Baff, Miss Brown, Mr. Pearce, Mr. Skelton, Mr. C. B. Thompson, Mr. E. A. Thompson, Mr. Wheeler, Mr. Baugh, Mr. Farnsworth, Mr. Shapiro, Mr. Vulkovic

ECON 201—PRINCIPLES OF ECONOMICS—3 cr. (3 and 0)
The fundamental principles of production, distribution and consumption with special consideration of their relationships to business organizations and governmental regulations in our economy.

ECON 202—PRINCIPLES OF ECONOMICS—3 cr. (3 and 0)
Continuation of Econ 201 with emphasis on current economic problems. Prerequisite: Econ 201.

ECON 301—LABOR PROBLEMS—3 cr. (3 and 0)
The economics of the labor market, the problems of the industrial worker, and the methods of adjusting labor-management disputes. Prerequisite: Econ 201.

ECON 302—MONEY AND BANKING—3 cr. (3 and 0)
Consideration of monetary systems, foreign exchange, credit instruments, and financial institutions; credit control, monetary stabilization, banking regulation and reform. Prerequisite: Econ 201 and 202.

ECON 305—INVESTMENT ANALYSIS—3 cr. (3 and 0)
A study of technique useful in analyzing alternative investment opportunities, with emphasis on corporate securities. Investment planning and portfolio management are considered. Prerequisite: Econ 201.

ECON 306—RISK AND INSURANCE—3 cr. (3 and 0)
Studies the nature of risk and the role of insurance in risk management from individual and business viewpoints by considering insurance carriers, contracts, underwriting and regulation. Prerequisite: Econ 201.

ECON 308—COLLECTIVE BARGAINING—3 cr. (3 and 0)
The practices, procedures, legal foundations, and legal structure associated with collective bargaining. The form and content of the labor contract, the grievance machinery, and the mediation and arbitration institutions will also be studied. Prerequisite: Econ 201.

ECON 309—GOVERNMENT AND BUSINESS—3 cr. (3 and 0)
The relationships between government and business, including, among other topics, governmental efforts to enforce competition, to regulate public utilities, and to protect the special interests of laborers, farmers, and consumers. Prerequisite: Econ 201.

ECON 312—COMMERCIAL LAW—3 cr. (3 and 0)
An introduction to business law with primary attention given to contracts, agency and negotiable instruments and sales. Prerequisite: Junior standing.

ECON 313—COMMERCIAL LAW—3 cr. (3 and 0)
Continuation of Econ 312 with emphasis on business organization, personal and real property, trade regulations and related topics. Prerequisite: Econ 312.

* On leave.
Econ 314—Intermediate Economic Theory—3 cr. (3 and 0)
An analytical study of the basic concepts of value and distribution under alternative market conditions. **Prerequisite:** Econ 201 and 202.

Econ 403—Development of Economic Thought—3 cr. (3 and 0)
Considers writings of economists, the problems they faced and the solutions offered, and the role of their theories in present day economic theory. **Prerequisite:** Econ 201 and permission of the instructor.

Econ 404—Comparative Economic Systems—3 cr. (3 and 0)
A comparative analytical and historical study of the principal economic systems which have been important in the modern world including, among others, capitalism and socialism. **Prerequisite:** Econ 201 and permission of instructor.

Econ 407—National Income and Employment Analysis—3 cr. (3 and 0)
An intensive study of selected economic theories with special emphasis on income and employment. Part of the course is devoted to the analysis of national income accounts and income. **Prerequisite:** Econ 201 and permission of instructor.

Econ 410—Economic Development—3 cr. (3 and 0)
Consideration and analysis of economic and related problems of the underdeveloped countries. Attention will be given to national and international programs designed to accelerate solution of these problems. **Prerequisite:** Econ 201.

Econ 412—International Trade and Economic Development—3 cr. (3 and 0)
The organization and operation of the international economy with emphasis on the theory and practice of international trade, international investment, and the development of underdeveloped nations. **Prerequisite:** Econ 201 and 202.

Econ 416—Development of the Modern Economy—3 cr. (3 and 0)
An analysis of the historical forces and influences which have contributed to the emergence and development of the modern economy. **Prerequisite:** Econ 201 and permission of instructor.

Econ 420—The Economics of Taxation—3 cr. (3 and 0)
The equity, welfare, and incentive effects of taxation, the effect of taxes on resource allocation, investment, and economic growth; and certain problems, such as averaging, taxation of public utilities, and tax reform. **Prerequisite:** Econ 314 or equivalent.

Econ 500—Advanced Economic Analysis—3 cr. (3 and 0)

Econ 510—Seminar in Economic Analysis—3 cr. (3 and 0)

Econ 511—Seminar in Labor Economics—3 cr. (3 and 0)

Econ 512—Seminar in the Development of Economic Thought—3 cr. (3 and 0)

Econ 521—Economic Theory I—3 cr. (3 and 0)

Econ 522—Economic Theory II—3 cr. (3 and 0)

Econ 591—Research—3 cr.

Econ 592—Research—3 cr.
EDUCATION

Mr. Landrith, Mr. Packer, Mr. Reel, Mr. Davis, Mr. Ware, Mr. Rodgers

Ed 301—History of American Education—3 cr. (3 and 0)
Development of educational systems, theories and practices against a back-
ground of American social and intellectual history. Prerequisite: Junior standing
or permission of the instructor.

Ed 302—Educational Psychology—3 cr. (3 and 0)
The nature, capacities, equipment, growth and development of the learner.

Ed 335—Adolescent Growth and Development—3 cr. (3 and 0)
The physical and emotional growth and development of the adolescent.
Prerequisite: Ed 302 or Psych 301.

Ed 406—History and Philosophy of Education—3 cr. (3 and 0)
An analysis of the development of modern education practices and philoso-
phies with emphasis upon the historical and philosophical development in the
United States.

Ed 412—Directed Teaching in High School Subjects—6 cr. (1 and 15)
A program of supervised observation and teaching in cooperation with se-
lected public schools in which opportunities are provided for prospective
teachers to secure experiences in the subject area of their choice. (Enrollment
is subject to individual approval of instructor in charge and is limited to seniors
or graduate students who have completed prerequisite courses and who have
the accumulated grade-point ratio necessary for graduation.)

Ed 424—Techniques of Teaching—3 cr. (3 and 0)
Instructional practices used in the secondary schools with emphasis on the
findings of research as related to instructional techniques.

Ed 458—Health Education—3 cr. (3 and 0)
A study of the information needed for effective cooperation with parents,
physicians and public health agencies in the promotion and improvement of
community health, including problems of personal hygiene, health records,
immunization, and control of communicable disease.

Ed 460—Curriculum Development in the Elementary School—3 cr.
(3 and 0)
An analysis and evaluation of newer practices in curriculum planning in the
elementary school. (Offered in Summer Sessions only.)

Ed 494—School and Community Relationships—3 cr. (3 and 0)
A study of the interdependence of the school and community, with emphasis
on educational implications. (Offered in Summer Sessions only.)

Ed 497—Audio-Visual Aids in Education—3 cr. (3 and 0)
The techniques and uses of audio-visual aids in improving teaching effectiveness.

Ed 503—Advanced Methods in Teaching—3 cr. (3 and 0)
Ed 505—Principles of Guidance—3 cr. (3 and 0)
Ed 508—Educational Tests and Measurements—3 cr. (3 and 0)
Ed 509—Analysis of the Individual—3 cr. (3 and 0)
Ed 510—Techniques of Counseling—3 cr. (3 and 0)
**Ed 511—Public School Administration (Finance)—3 cr. (3 and 0)**
**Ed 513—Educational and Vocational Informational Services and Placement—3 cr. (3 and 0)**
**Ed 530—Techniques of Supervision—The Public Schools—3 cr. (3 and 0) (Offered in Summer Sessions only.)**
**Ed 531—Evaluation of Secondary School Instruction—3 cr. (3 and 0) (Offered in Summer Sessions only.)**
**Ed 590—Introduction to Research in Education—3 cr. (3 and 0)**

**ELECTRICAL ENGINEERING**

Mr. Thurston

Mr. Ball, Mr. Broyles, Mr. Goodin, Mr. Kersey, Mr. Long,
Mr. Martin, Mr. Poe, Mr. Zink, Mr. Brittain, Mr. Fitch,*
Mr. Marinos, Mr. Rochester, Mr. Stanley

**EE 205—Electric Circuits I—3 cr. (3 and 0)**
The fundamental laws of circuit theory utilizing the lumped-parameter concept to include such topics as network topology, conventional circuit solution methods, network response—both natural and forced—and singularity functions in signal analysis. **Prerequisite:** Enrollment in Math 206 and Phys 221.

**EE 206—Electric Circuits II—3 cr. (3 and 0)**
A continuation of EE 205 to include steady state A.C. circuit theory, magnetically coupled circuits and an introduction to complex frequency domain analysis. **Prerequisite:** EE 205 and enrollment in Math 208 and Phys 222.

**EE 208—Electrical Engineering Laboratory I—1 cr. (0 and 3)**
The first of a series of coordinated laboratory courses. Basic types of instruments, with accuracies and limitations examined. Good laboratory procedures are stressed, with experiments in electric circuits. **Prerequisite:** EE 205 and enrollment in EE 206.

**EE 299—Digital Computation—1 cr. (0 and 3)**
An introduction to digital computer programming for students majoring in Electrical Engineering. Emphasis is placed on the computer languages in use at Clemson University, and their application to the solution of simple problems in Electrical Engineering. **Prerequisite:** Sophomore standing.

**EE 303—Introduction to Electrical Engineering—3 cr. (3 and 0)**
Electric and magnetic circuits, phasor algebra as applied to A.C. circuits, machinery, electronics. For students in Industrial Education and Industrial Management. **Prerequisite:** Math 106, Phys 202 and 204.

**EE 307—Basic Electrical Engineering—3 cr. (3 and 0)**
Electrical engineering for students who need a strong background in the subject, but who are not planning to specialize in the field. A firm foundation in circuit theory is provided in this course. **Prerequisite:** Math 206, Phys 222 and 224.

**EE 308—Basic Electrical Engineering—3 cr. (3 and 0)**
A continuation of EE 307, with emphasis on electronics, instrumentation, and basic electromechanics. **Prerequisite:** EE 307.

* On leave.
EE 309—Electrical Engineering Laboratory—1 cr. (0 and 3)
A laboratory course designed to accompany EE 307. Prerequisite: EE 307 or enrollment in EE 307.

EE 310—Electrical Engineering Laboratory—1 cr. (0 and 3)
A laboratory course designed to accompany EE 308. Prerequisite: EE 308 or enrollment in EE 308.

EE 312—Electromechanics—3 cr. (3 and 0)
A first course in electromechanical energy conversion with emphasis on similarities, basic ideas, and systems concepts of such devices. Consideration is given to both steady state and dynamic operation. Prerequisite: EE 208 and EE 323.

EE 314—Electrical Engineering Laboratory III—1 cr. (0 and 3)
More advanced laboratory work, with emphasis on electromechanics and network theory. Prerequisite: EE 325 and enrollment in EE 312 and EE 328.

EE 320—Electronics I—3 cr. (3 and 0)
Basic electronics. Includes principles of solid state and high-vacuum electronic devices, with some discussion of the physics involved as well as the circuitry. Prerequisite: EE 308, EE 310, or EE 206 and EE 208.

EE 322—Electrical Engineering Laboratory IV—1 cr. (0 and 3)
Laboratory problems associated with electronics and network theory. Prerequisite: EE 325 and enrollment in EE 324 and EE 328.

EE 323—Electric and Magnetic Fields—3 cr. (3 and 0)
An introduction to classical electromagnetics, including potential theory, electrical properties of isotropic media, and Maxwell's equations. Prerequisite: Math 208 and Phys 222.

EE 324—Electronics II—3 cr. (3 and 0)
A continuation of EE 320. Small-signal amplifiers, large-signal amplifiers, amplifiers with negative feedback, oscillators, modulation and detection. Prerequisite: EE 320.

EE 325—Electrical Engineering Laboratory II—1 cr. (0 and 3)
Further laboratory problems, with examples chosen from the areas of circuits, fields and basic electronics. Prerequisite: EE 206 and enrollment in EE 320, EE 323 and EE 327.

EE 327—Network Theory I—3 cr. (3 and 0)
Continuation of EE 206. Topics covered include signal analysis using Fourier series and integral methods, as well as Laplace transforms; polyphase circuits. Prerequisite: EE 206 and Junior standing.

EE 328—Network Theory II—3 cr. (3 and 0)
Continuation of EE 327. Some concepts of network synthesis are included along with a study of filters and transmission lines. Both lumped and distributed-constant systems are discussed. Prerequisite: EE 323 and EE 327.

EE 401—Seminar—1 cr. (1 and 0)
Discussions on topics from current scientific periodicals and on research and developments in industry. A library research paper is prepared as part of the course work. Prerequisite: Senior standing.
EE 402—ENGINEERING ANALYSIS—1 cr. (1 and 0)
The application of engineering principles and methods to the study of typical problems that arise in the various fields of electrical engineering. Prerequisite: EE 401 and Senior standing.

EE 403—ENERGY CONVERSION—3 cr. (3 and 0)
Various methods of energy conversion, both mechanical and non-mechanical. Fuel cells, magnetohydrodynamics, and other methods are discussed along with more conventional systems. Prerequisite: EE 312 and EE 314.

EE 409—ELECTRICAL ENGINEERING LABORATORY V—1 cr. (0 and 3)
A project-type laboratory with topics chosen from the fields of energy conversion, control systems, circuits and electronics. Prerequisite: Enrollment in EE 403 and EE 410.

EE 410—FEEDBACK CONTROL SYSTEMS—3 cr. (3 and 0)
Closed-loop control systems by use of the Laplace transform and transfer function methods. Root-locus, Nyquist, Bode, and Nichols diagrams are used. Prerequisite: EE 312 and Senior standing.

EE 419—ELECTRICAL MACHINERY LABORATORY—3 cr. (0 and 3)
A laboratory course designed to accompany EE 421. Prerequisite: Enrollment in EE 421.

EE 420—POWER SYSTEM ANALYSIS—3 cr. (3 and 0)
Studies of transmission lines using lumped and distributed constants. Symmetrical components and their use in system fault calculations. Introductory theory of power system stability. Prerequisite: EE 312 and EE 328.

EE 421—ELECTRICAL MACHINERY—3 cr. (3 and 0)
Characteristics of D.C. and A.C. motors and generators, with emphasis on an understanding of the physical principles involved. Prerequisite: EE 312 and EE 314.

EE 425—INTRODUCTION TO THEORY AND DESIGN OF DIGITAL COMPUTERS—3 cr. (3 and 0)
A study of Boolean algebra and its application to the design of relay networks. Various logic circuits such as AND, OR, NOT, NAND and NOR are discussed along with the electronic devices used to perform these operations. Other topics include systematic minimization, codes, Boolean matrices, iterated and cascaded networks. Prerequisite: Senior standing in Electrical Engineering or permission of instructor.

EE 428—COMMUNICATIONS THEORY—3 cr. (3 and 0)
Basic theory of information and its time domain and frequency domain interpretations of AM, FM, and pulse modulation techniques. Introduction to noise and statistical techniques in communications systems. Prerequisite: EE 316 and EE 320.

EE 431—ELECTRONICS III—3 cr. (3 and 0)
Active and passive wave-shaping, memory, and switching circuits. Prerequisite: EE 324 and concurrent registration in EE 433.

EE 433—ELECTRONICS III LABORATORY—1 cr. (0 and 3)
A laboratory course designed to accompany EE 431. Prerequisite: Concurrent registration in EE 431.
EE 436—Radiation and Wave Propagation—3 cr. (3 and 0)
Electromagnetic waves, waveguides, and antennas. Prerequisite: EE 328.

The courses listed below are available only to qualified students enrolled in
the Bell System Regional School. For any further information on these courses
see the director of the Regional School in room 102A Riggs Hall.

EE 490—Circuit Theory—3 cr. (3 and 0)
Primarily circuit analysis in the frequency domain including steady state AC,
coupled circuits, complex frequency domain, Fourier Series, Fourier integral
and Laplace transform methods of analysis.

EE 491—Electronics I—3 cr. (3 and 0)
Basic electronics. Includes principles of solid state and high vacuum elec-
tronic devices, with a study of both the physics and circuitry involved.

EE 492—Electronics II—3 cr. (3 and 0)
A continuation of EE 491. Small-signal amplifiers, large-signal amplifiers,
negative feedback amplifiers, oscillators, non-linear circuit analysis and micro-
wave devices.

EE 493—Field Theory—3 cr. (3 and 0)
Beginning with a study of vector analysis, the study of these subjects follow:
Coulomb’s law, electric field intensity and flux density, Gauss’s law, divergence,
energy, potential, capacitance, Poisson’s and Laplace’s equations, steady and
time varying fields and Maxwell’s equations.

EE 494—Transmission—3 cr. (3 and 0)
A continuation of EE 493. The central theme is transmission of electric
energy. The study includes transmission lines, propagation, radiation and
antenna systems.

EE 495—Communications Theory—3 cr. (3 and 0)
A unifying treatment of the principles underlying modern information trans-
mission systems. Information content, system capacity, transmission through
electric networks, modulation methods and system noise are studied.

EE 496—Switching I—3 cr. (3 and 0)
Boolean algebra introduces the study of switching logic, logic circuits and
combinational circuits. Boolean matrices, bilateral networks, symmetric func-
tions and iterative networks are included in combinational circuit study.

EE 497—Switching II—3 cr. (3 and 0)
A continuation of EE 496 to include sequential circuits, level and pulse logic;
registration and calculation circuits, memory devices, computer programming
and electronic switching systems.

EE 498—Engineering Economics I—3 cr. (3 and 0)
A study of background theory of economics, basic financial accounting and
financial management. Handling of fixed assets, long term equities and inven-
tories from an accounting viewpoint. Principles of statement analysis, budgeting
and cost of capital. The role of interest in economy cost studies.

EE 499—Engineering Economics II—3 cr. (3 and 0)
A continuation of EE 498 including depreciation engineering, capital repay-
ment concepts, advanced topics in economy cost studies, rate regulation and
rate making policies in public utilities, pricing policies and cost allocations.
EE 501—Transients in Linear Systems—3 cr. (3 and 0)
EE 503—Seminar—1 cr. (1 and 0)
EE 507—Statistical Theory of Communication—3 cr. (3 and 0)
EE 510—Analytical Design of Linear Feedback Controls I—3 cr. (3 and 0)
EE 511—Electric Power Stations—3 cr. (3 and 0)
EE 512—Analytical Design of Linear Feedback Controls II—3 cr. (3 and 0)
EE 513—Power System Stability—3 cr. (3 and 0)
EE 515—Network Analysis and Synthesis I—3 cr. (3 and 0)
EE 516—Network Analysis and Synthesis II—3 cr. (3 and 0)
EE 518—Electronic Circuits—3 cr. (3 and 0)
EE 519—Electronic Circuits Laboratory—1 cr. (0 and 3)
EE 521—Radiation and Wave Propagation—3 cr. (3 and 0)
EE 525—Solid-State Electronics—3 cr. (3 and 0)
EE 528—Pulse Techniques—3 cr. (3 and 0)
EE 529—Pulse Techniques Laboratory—1 cr. (0 and 3)
EE 536—Optical Electromagnetics and Quantum Electronics—3 cr. (3 and 0)
EE 545—Selected Topics in Electrical Engineering—3 cr. (3 and 0)
EE 591—Research—3 cr.
EE 592—Research—3 cr.

ENGINEERING

Engr 101—Engineering Systems—Non-Credit (1 and 0)
A series of lectures outlining the role and scope of engineering in service to mankind. Emphasis is placed on the difference between science and engineering, the emerging role of engineering in new technology, the important technological needs of mankind, and the importance of the humanities and social studies to the engineer.

ENGINEERING GRAPHICS

Mr. Bradbury
Mr. Banister, Mr. Hammond, Mr. Jameson, Mr. McHugh,
Mr. Carter, Mr. Clement, Mr. Chen

EG 101—Freehand Sketching—1 cr. (0 and 3)
Principles of technical sketching, including the development of skills in technical lettering and freehand orthographic and pictorial drawing.

EG 105—Engineering Graphics—2 cr. (0 and 6)
A course in graphical communication. Freehand sketching, orthographic and auxiliary projection, sectional views, and conventional practices, dimensioning, reading drawings.
EG 106—ENGINEERING GRAPHICS—2 cr. (0 and 6)
A continuation of EG 105. Detail and assembly drawings. Intersections and developments, production illustration, charts and graphs. Prerequisite: EG 105.

EG 109—ENGINEERING COMMUNICATION AND DESIGN—3 cr. (1 and 6)
Graphical, written, and verbal means of communicating ideas and information in engineering with emphasis on graphical methods of developing and transmitting ideas. The role of graphics in the conceptualization and evolution of a design.

EG 110—ENGINEERING COMMUNICATION AND DESIGN—3 cr. (1 and 6)

EG 203—GRAPHICAL TECHNOLOGY FOR INDUSTRIAL EDUCATION—3 cr. (1 and 6)

EG 302—GRAPHICAL COMPUTATION—2 cr. (1 and 3)
Graphic layouts of empirical equations. The application of graphical solution of equations, nomography, and the graphical calculus to the solution of problems in engineering and science. Graphical solution of differential equations. Prerequisite: EG 109, Math 106 or equivalent.

ENGINEERING MECHANICS
Mr. Moorman
Mr. Bauld, Mr. Nowack, Mr. Uldrick, Mr. Dirksen, Mr. Law, Mr. Mitchell,* Mr. Castro,* Mr. Gambrell*

EM 201—ENGINEERING MECHANICS (STATICS)—3 cr. (3 and 0)
Forces and force systems and their external effects on bodies; principally, the condition of equilibrium. The techniques of vector mathematics are employed, and the rigor of physical analysis is emphasized. Prerequisite: Phys 122 or Phys 211, concurrent registration in Math 206.

EM 202—ENGINEERING MECHANICS (DYNAMICS)—3 cr. (3 and 0)
A continuation of EM 201. The principal topics are kinematics and kinetics of particles and bodies of finite size. Techniques of vector mathematics are employed. Prerequisite: EM 201, Math 206.

EM 304—MECHANICS OF MATERIALS—3 cr. (3 and 0)
The relationships between external loads on solid bodies or members and the resulting internal effects and dimension changes, including the derivation of rational formulas for stresses and deformations and the identification and use of important physical properties of engineering materials. Prerequisite: EM 201 and Math 206.

* On leave.
EM 305—Mechanics of Materials Laboratory—1 cr. (0 and 3)
Theoretical relationships considered in EM 304 are verified. Students observe the behavior under load and the failure of engineering materials; identify and evaluate physical properties of materials important to design and manufacturing processes; and are acquainted with various testing methods, testing machines, and instruments. Prerequisite: Must be accompanied or preceded by EM 304.

EM 320—Fluid Mechanics—3 cr. (3 and 0)
The behavior of fluids at rest or in motion. Emphasis is placed upon a rational, analytical approach from which are developed basic principles of broad applicability to all fields of engineering. Prerequisite: EM 202.

EM 322—Fluid Mechanics Laboratory—1 cr. (0 and 3)
The principles developed in EM 320 are verified and demonstrated. Familiarization with orderly techniques in organizing and reporting results of experimental investigations and with the use of instruments and equipment is afforded. Prerequisite: Must be accompanied or preceded by EM 320.

EM 420—Hydraulic Engineering—3 cr. (3 and 0)
Elements of hydrology and the application of principles of fluid mechanics to engineering problems. Topics included are open channel flow; flow in conduits under pressure; hydraulic machinery; and the broad principles of planning reservoirs, water supply systems, dams, spillways, and other hydraulic works. Prerequisite: EM 320.

EM 450—Mechanical Vibrations—3 cr. (3 and 0)
Basic theory of mechanical vibrations with applications to problems including those of free vibrations with and without damping; forced vibrations, systems of one, two, and many degrees of freedom. Prerequisite: EM 202, EM 304, and Math 306 or Math 208.

EM 470—Experimental Stress Analysis—3 cr. (2 and 3)
Experimental analysis of stress fields and determination of maximum principal stresses in deformable bodies. Emphasis is on the theoretical consideration in the reduction of data as well as the obtaining of data. Methods studied include photoelasticity, electrical resistance strain gages, brittle lacquer, and birefringent coatings. Prerequisite: EM 304 and permission of instructor.

EM 501—Experimental Stress Analysis—Advanced—3 cr. (2 and 3)

EM 521—Continuum Mechanics—3 cr. (3 and 0)

EM 523—Dimensional Analysis and Dynamic Similarity—3 cr.
(3 and 0)

EM 525—Advanced Mechanics of Materials—3 cr. (3 and 0)

EM 527—Topics in Analytical Mechanics—3 cr. (3 and 0)

EM 529—Energy Methods and Variational Principles—3 cr. (3 and 0)

EM 531—Theory of Elasticity I—3 cr. (3 and 0)

EM 532—Theory of Elasticity II—3 cr. (3 and 0)

EM 534—Theory of Elastic Stability—3 cr. (3 and 0)

EM 545—Intermediate Dynamics—3 cr. (3 and 0)
EM 552—Theory of Ideal Fluid Flow—3 cr. (3 and 0)
EM 553—Theory of Viscous Fluid Flow—3 cr. (3 and 0)
EM 556—Flow in Open Channels—3 cr. (3 and 0)
EM 561—Hydrology—3 cr. (3 and 0)
EM 562—Advanced Hydrology—2 cr. (2 and 0)
EM 564—Ground-Water Hydrology—3 cr. (3 and 0)
EM 570—Flood Control—3 cr. (3 and 0)
EM 572—Hydraulic Projects—3 cr. (3 and 0)
EM 589—Seminar—1 cr. (1 and 0)
EM 590—Seminar—1 cr. (1 and 0)
EM 591—Research—3 cr.
EM 592—Research—3 cr.
EM 632—Theory of Plasticity—3 cr. (3 and 0)
EM 680—Special Topics in Mechanics—3 cr. (3 and 0)
EM 681—Special Topics in Mechanics—3 cr. (3 and 0)
EM 682—Special Topics in Mechanics—3 cr. (3 and 0)
EM 691—Doctoral Research—Credit to be arranged.

ENGLISH
Mr. Cox
Mr. C. B. Green, Mr. Owings, Mr. Calhoun, Mr. Caskey, Mr. Felder, Miss Holman, Mr. Holt, Mr. McGee, Mr. Steadman, Mr. Watson, Mr. Wilson, Mr. Winter, Mr. Fear, Mr. Gum, Mr. Henry, Mr. Idol, Mr. Jennings, Mr. Olsen, Mr. Simms, Mr. Usrey, Mr. Willey, Mr. Yount, Mrs. Arrington, Miss Binse, Mr. Dees, Mr. Griffin, Miss Haynes, Mr. Israel, Miss Merritt, Mrs. Rice, Mr. Skardon, Mr. McElroy

ENGL 101—English Composition—3 cr. (3 and 0)
Training in correct and effective expression.

ENGL 102—English Composition—3 cr. (3 and 0)
Continued emphasis on correct and effective expression; training in the organization and writing of various types of expository and semi-technical papers, including the research report. Prerequisite: Engl 101.

ENGL 181—English Composition—3 cr. (3 and 0)
Honors section of Engl 101; admission by invitation.

ENGL 182—English Composition—3 cr. (3 and 0)
Honors section of Engl 102; admission by invitation

ENGL 203—A Survey of English Literature—3 cr. (3 and 0)
Chief British authors and works from Beowulf through the Romantic period; continued emphasis on composition. Prerequisite: Engl 102.

* On leave.
ENGL 204—A Survey of English and American Literature—3 cr. (3 and 0)
Chief British authors and works from the Victorian period to the present time, and selected readings from American literature. Proficiency in composition must be demonstrated. Prerequisite: Engl 203.

ENGL 283—Survey of English Literature—3 cr. (3 and 0) Honors section of Engl 203; admission by invitation.

ENGL 284—Survey of English and American Literature—3 cr. (3 and 0) Honors section of Engl 204; admission by invitation.

ENGL 300—Journalism—1 cr. (1 and 0) Responsibilities and duties of students editing uncensored publications; criticism of student publications; visiting speakers; review of English fundamentals. Open to members of publication staffs and to others by permission of instructor. Fall term only. Prerequisite: Engl 102.

ENGL 301—Public Speaking—3 cr. (3 and 0) Practical training in public speaking; attention to diction, voice, and platform presence; an introduction to parliamentary procedure; practice in writing and delivering short speeches. Prerequisite: Engl 203 and 204.

ENGL 303—Voice and Diction—3 cr. (3 and 0) Practical training in speech, with emphasis on clarity, vocal variety, and tone quality.

ENGL 304—Advanced Composition—3 cr. (3 and 0) Supervised writing for students of advanced standing; a laboratory, following basic types of writing, with each student undertaking projects according to his interest; some attention to reports, business letters, research methods and materials. Weekly papers and some longer exercises. Limited enrollment. Prerequisite: Engl 203 and 204.

ENGL 306—Debating—1 cr. (1 and 0) The application of debating to contemporary problems. May be repeated until a maximum of three credits has been earned. Prerequisite: Permission of the instructor.

ENGL 307—Vocabulary Building—3 cr. (3 and 0) Development of a useful, discriminating vocabulary for writing, speaking, and reading. Student notebooks and proficiency quizzes. Prerequisite: Engl 203 and 204.

ENGL 331—Creative Writing—3 cr. (3 and 0) The technique of non-expository writing—narration, description, dramatization. Prerequisite: Permission of the instructor.

ENGL 332—Creative Writing—3 cr. (3 and 0) A continuation of Engl 331.

ENGL 351—Children’s Literature—3 cr. (3 and 0) Wide reading in prose and verse suitable for children (Summer Sessions only.)

ENGL 402—The English Language—3 cr. (3 and 0) Studies in English usage and the historical development of the language. Prerequisite: Engl 203 and 204.
Engr 405—Shakespeare—3 cr. (3 and 0)
A selective study of Shakespeare's plays with attention to his development as a dramatist. Prerequisite: Engl 203 and 204.

Engr 406—Shakespeare—3 cr. (3 and 0)
A continuation of Engr 405. Prerequisite: Engl 203 and 204.

Engr 409—Chaucer—3 cr. (3 and 0)
Chaucer as an artist; the "Prologue" for historical and linguistic orientation; "The Canterbury Tales," "House of Fame," "Parliament of Fowls," and "Troilus and Criseyde" as art forms. Prerequisite: Engl 203 and 204.

Engr 415—Introduction to Drama—3 cr. (3 and 0)
Principles and progress of drama from Aeschylus to Ibsen, analysis of representative plays; critical reports; classroom reading of great scenes. Prerequisite: Engl 203 and 204.

Engr 416—Introduction to Drama—3 cr. (3 and 0)
Principles and progress of drama from Ibsen to the present; analysis of representative plays; critical reports; classroom reading of great scenes; discussion of important aspects of modern drama. Prerequisite: Engl 203 and 204.

Engr 423—A Survey of American Literature—3 cr. (3 and 0)
The colonial period to the Civil War, with emphasis on major authors. Prerequisite: Engl 203 and 204.

Engr 424—A Survey of American Literature—3 cr. (3 and 0)
From the Civil War to the present, with emphasis upon major authors. Prerequisite: Engl 203 and 204.

Engr 425—The Romantic Revival—3 cr. (3 and 0)
The eighteenth-century forerunners of Romanticism; Wordsworth, Coleridge, Byron, Shelley, Keats; the essayists. Prerequisite: Engl 203 and 204.

Engr 427—Victorian Poetry and Prose—3 cr. (3 and 0)
Representative works from the prose and poetry of Victorian writers; consideration of English intellectual, social, and political life of the period. Prerequisite: Engl 203 and 204.

Engr 431—The Restoration and Eighteenth Century—3 cr. (3 and 0)
Readings in Dryden, Swift, Pope, and Dr. Johnson. Prerequisite: Engl 203 and 204.

Engr 435—Southern Literature—3 cr. (3 and 0)
The intellectual and literary achievement of the South from 1607 to the present, with emphasis upon the writers of the nineteenth century. Prerequisite: Engl 203 and 204.

Engr 436—Milton and His Age—3 cr. (3 and 0)
The development of Milton's thought and art in relation to his times and to the writings of his contemporaries. Prerequisite: Engl 203 and 204.

Engr 437—The English Novel—3 cr. (3 and 0)
A critical and historical study of major English novelists from Defoe to Hardy. Prerequisite: Engl 203 and 204.
ENGL 438—CONTEMPORARY POETRY—3 cr. (3 and 0)
The modern tradition in English and American poetry from Yeats to the present; relevant critical essays. Prerequisite: Engl 203 and 204.

ENGL 439—CONTEMPORARY FICTION—3 cr. (3 and 0)
Major novelists and short story writers from Dostoevsky to Kerouac, with stress upon British and American writers. Prerequisite: Engl 203 and 204.

ENGL 440—LITERARY CRITICISM—3 cr. (3 and 0)
Major critical approaches to literature, in theory and practice, from Aristotle to the present. Prerequisite: Engl 203 and 204.

ENGL 441—A SURVEY OF WORLD LITERATURE I—3 cr. (3 and 0)
Translations from the Hellenic, Hebraic and Oriental worlds, with emphasis on major authors. Prerequisite: Engl 203 and 204.

ENGL 442—A SURVEY OF WORLD LITERATURE II—3 cr. (3 and 0)
Translations from the Medieval, Renaissance and Modern worlds, with emphasis on major authors. Prerequisite: Engl 203 and 204.

ENGL 443—SEVENTEENTH CENTURY POETRY AND PROSE—3 cr. (3 and 0)
A survey of British authors of the seventeenth century other than Shakespeare and Milton.

ENGL 503—SEMINAR IN AMERICAN LITERATURE I—3 cr. (3 and 0)
ENGL 504—SEMINAR IN AMERICAN LITERATURE II—3 cr. (3 and 0)
ENGL 505—SEMINAR IN ENGLISH LITERATURE I—3 cr. (3 and 0)
ENGL 506—SEMINAR IN ENGLISH LITERATURE II—3 cr. (3 and 0)

ENGL 590—INTRODUCTION TO RESEARCH—1 cr. (1 and 0)

ENGL 591—RESEARCH—2 cr. (2 and 0)
ENGL 592—RESEARCH—3 cr. (3 and 0)

ENTOMOLOGY
Mr. Cochran
Mr. Reed, Mr. Adkins, Mr. Fox, Mr. King, Mr. Ware,
Mr. Buxton, Mr. Tombes

ENT 301—ELEMENTARY AND ECONOMIC ENTOMOLOGY—3 cr. (2 and 3)
A general introduction to Entomology with emphasis on anatomy, metamorphosis, life-histories of our most important species and methods of control. Prerequisite: Zool 101 and 103.

ENT 305—ECONOMIC ENTOMOLOGY—3 cr. (2 and 3)
Identification and life-histories of injurious insects; their damage, and control measures. Common pests of the following are studied: cotton, corn, small grains, legume field crops, tobacco, sugar cane, stored grain and seed, livestock and man. Prerequisite: Zool 101, 103 and Ent 301.

ENT 306—ECONOMIC ENTOMOLOGY—3 cr. (2 and 3)
Insecticide and other control measures for insects. This is followed by detailed study of habits, life-histories and approved control measures for insect pests of all fruit and vegetable crops. Prerequisite: Zool 101, 103 and Ent 301.
ENT 307—Forest Entomology—3 cr. (2 and 3)
Insects of economic importance to forests, forest products and shade trees, and their role in the practice of good forest management as well as their significance in the natural environment.

ENT 308—Apiculture—3 cr. (2 and 3)
A detailed study of the honey bee and its economic importance in pollination and honey production. Attention will be given to bee behavior, colony management, equipment, honey plant identification, and honey production and processing. Prerequisite: Zool 101, 103 and permission of the instructor.

ENT 405—Insect Morphology—4 cr. (3 and 3)
A study of insect structure in relation to function and of the variation of form in insects. Prerequisite: Ent 301.

ENT 408—General and Taxonomic Entomology—5 cr. (3 and 6)
Lecture material includes a review of the bionomics of the principal families of insects. Laboratory work consists of practice in the identification of adults of the principal families in the major orders. Prerequisite: Zool 101, 103, Ent 301; Ent 405 desirable.

ENT 455—Medical and Veterinary Entomology—3 cr. (2 and 3)
Insects and their arthropod relatives which are of considerable economic importance in their effect on man and animals.

ENT 461—Seminar—1 cr. (1 and 0)
Students review the principal journals pertaining to insects and related animals; also review the lives and activities of prominent pioneer entomologists. Prerequisite: Zool 101, 103; Ent 301.

ENT 462—Seminar—1 cr. (1 and 0)
Continuation of Ent 461.

ENT 468—Introduction to Research—2 cr. (1 and 3)
Principles, developments and changes in research methods related to certain fields of agricultural research. The students obtain practice in experimental techniques, scientific writing and the use and maintenance of various research instruments and equipment.

ENT 508—Taxonomy of Immature Insects—3 cr. (1 and 6)
ENT 556—Medical Entomology—3 cr. (2 and 3)
ENT 560—Principles of Insect Control—3 cr. (3 and 0)
ENT 561—Insect Toxicology—3 cr. (2 and 3)
ENT 562—Insect Physiology—3 cr. (2 and 3)
ENT 563—Special Problems in Entomology—3 to 6 cr.
ENT 590—Research Techniques in Agriculture—3 cr. (2 and 3)
ENT 591—Research—3 cr.
ENT 592—Research—3 cr.
ENT 691—Doctoral Research—Credit to be arranged.
EXPERIMENTAL STATISTICS

Mr. Byrd, Mr. Todd, Mr. Corley

Ex St 401—Introductory Statistics—3 cr. (2 and 3)
An elementary course dealing with basic statistical concepts and methods, organization and presentation of data, measures of central tendency and variation, problems of sampling, simple regression and correlation and introduction to inductive statistics.

Ex St 462—Statistics Applied to Economics—3 cr. (3 and 0)
Statistical methods used in the collection, analysis, presentation and interpretation of economic data. Special attention is given to time series analysis, the construction of index numbers and the designing of samples for surveys in the social science fields. Prerequisite: Ex St 401.

Ex St 501—Statistical Methods I—4 cr. (3 and 3)
Ex St 502—Statistical Methods II—3 cr. (3 and 0)
Ex St 512—Design of Experiments—3 cr. (3 and 0)

FOOD SCIENCE

Mr. Williams

Mr. Shewfelt, Mr. Mickelberry, Mr. Wheeler

Fd Sc 301—Raw Food Materials for Processing—3 cr. (2 and 3)
This course includes lectures, reference reading, and laboratory work on the fruits, vegetables, cereal grains, oil seeds, and sugar crops important to the food processing industry. Commercial growing areas, maturity characteristics, effects of harvesting and handling on quality, storage of raw materials, quality grading, and government standards are covered. Prerequisite: Bot 101.

Fd Sc 303—Elements of Food Science—3 cr. (3 and 0)
Lectures and reference reading cover the principles of food preservation by freezing, dehydration, canning, concentration, brining, smoking, sugar and chemical additives. Prerequisite: Ch 220 or 323 and 327 and Phys 201 and 203.

Fd Sc 304—Food Processing—3 cr. (1 and 6)
Lectures are concerned with a review of the fundamentals and technology of canning, freezing, dehydration, and types of pack. The essentials of factory quality control are discussed. Laboratory work introduces the student to processing equipment. Canning, freezing, dehydration, and fermentation operations relating to fruits and vegetables are conducted. Subjective and objective quality tests are made, and quality grading is conducted by government standards. Prerequisite: Fd Sc 303.

Fd Sc 401—Elements of Food Science—3 cr. (3 and 0)
Lectures and reference reading cover the principles of processing cereal grain products, sugars, syrups, vegetable oils, dairy products, meats, fish, confectionary, fruits and vegetable juices, tea, coffee, nuts, spices, and flavors. Principles of packaging are discussed. Prerequisite: Ch 220 or Ch 323 and 327 and Phys 201 and 203.

* On leave.
Fd Sc 404—Food Processing—3 cr. (1 and 6)
Lectures are concerned with the fundamentals and technology of canning and freezing of formulated products, meats, and poultry, the processing of eggs, vegetable oils, and cereal grains, and the manufacture of mayonnaise and salad dressings. Laboratory work is concerned with processing of meat, poultry, vegetable oils, and formulated products (baking mixes, pie mixes, and others), and manufacture of mayonnaise and salad dressings. Prerequisite: Fd Sc 401.

Fd Sc 405—Food Analysis—1 cr. (0 and 3)
Laboratory work emphasizes chemical and physical methods important in food quality control. Included are methods for color, texture, flavor, and composition. Prerequisite: Ch 312 and 314.

Fd Sc 406—Biochemistry of Nutrition—3 cr. (2 and 3)
Human nutrition is discussed in relation to man’s needs for specific nutrients. Research methodology in nutrition investigations is explained. Laboratory includes work with small animals and assays for nutrients by chemical and microbiological methods. Prerequisite: Ch 312 and 314 and Ch 220 or 323 and 327.

Fd Sc 407—Food Product Analysis—2 cr. (1 and 3)
Principles and methods used in the analysis of food products for major constituents including total solids, protein, fat, sugars, minerals, vitamins, fiber, and pigments. Prerequisite: Organic chemistry and biochemistry.

Fd Sc 500—Laboratory Procedures in Nutrition—4 cr. (2 and 6)

FORESTRY
Mr. Lehotsky

Mr. Bruner, Mr. Cool, Mr. McGregor, Mr. Randel, Mr. Schoenike, Mr. Warner, Mr. Lane, Mr. Shain

For 201—Introduction to Forestry—1 cr. (1 and 0)
An informative sketch of forestry, forests, and forestry tasks of the nation; education in career opportunities of foresters. Prerequisite: Bot 101.

For 202—Dendrology—4 cr. (3 and 3)
Identification and nomenclature of the principal forest trees of the United States; their geographical distribution and economic importance; identification of many forest shrubs and commonly planted exotics. Prerequisite: Bot 101.

For 203—Silvics—2 cr. (2 and 0)
Growth factors influencing the establishment and development of forest trees and stands. Prerequisite: Bot 101, Ch 102.

For 251S—Silvics—2 cr. (Summer Camp)
Field studies of growth factors influencing the establishment and development of forest stands. Prerequisite: Agron 202, Bot 356, For 202, For 203.

For 252S—Forest Engineering—2 cr. (Summer Camp)
Field surveying, establishment of boundary lines, planning and construction of forest trails and roads. Prerequisite: CE 200, EG 105.
For 253S—Dendrometry—4 cr. (Summer Camp)
Elements of mensuration dealing with volume determination of standing
and harvested trees as well as forest stands. Prerequisite: CE 200, EG 105,
For 202.

For 254S—Forest Products—1 cr. (Summer Camp)
Field studies of logging methods and equipment; trips to selected wood-
using industries. Prerequisite: CE 200, For 202.

For 301—Aerial Forest Mapping—3 cr. (2 and 3)
Use of aerial photographs in forestry; elementary photographic measurements;
aerial photo interpretations; mapping and timber estimating procedures. Pre-
requisite: CE 203 and Forestry Summer Camp.

For 302—Dendrometry—3 cr. (2 and 3)
Volume determination of trees, logs, and stands; statistical procedures
applied to forest measurements. Prerequisite: Ex St 401 and Forestry Summer
Camp.

For 303—Silviculture—4 cr. (3 and 3)
Maintenance, harvesting, natural and artificial regeneration of forest stands
based on the interrelation of biotic characteristics of stands and their environ-
ment. Prerequisite: For 203 and Forestry Summer Camp.

For 304—Forest Economics—3 cr. (3 and 0)
Economic problems and principles involved in the utilization of forest land
and timber and in the distribution of forest products; cost analysis of integrated
forest operations. Prerequisite: Econ 201.

For 306—Wood Technology—1 cr. (0 and 3)
Macroscopic and microscopic identification, properties, and uses of selected
economically significant timbers. Prerequisite: Bot 101, Ch 102.

For 307—Farm Forestry—3 cr. (2 and 3)
A compendium of forestry subjects forming a foundation for the management
and utilization of farm forests and especially those of South Carolina. Pre-
requisite: Bot 101.

For 402—Logging and Milling—4 cr. (2 and 6)
Logging and milling methods and costs, their administration; analysis of
logging and milling operations; seasoning, grading, and marketing of lumber. Pre-
requisite: Senior standing.

For 403—Forest Products—3 cr. (2 and 3)
Primary forest products other than sawlogs, e.g., poles, pulpwood, veneer
stock, excelsior; secondary forest products, e.g., naval stores, maple syrup,
Christmas trees; utilization and marketing of forest products. Prerequisite: Phys
202 and Senior standing.

For 404—Management Plans—1 cr. (0 and 3)
Analysis and assembling of factors entering into a forest working plan;
drawing of maps corollary to forest regulation; preparation of management
plans. Prerequisite: For 407.

For 405—Forest Protection—2 cr. (2 and 0)
Causative and control factors of forest fires; fire prevention and suppression.
Protection of forest resources against damages caused by man and animals. Prerequisite: Senior standing.
For 406—Forest Policy and Administration—2 cr. (2 and 0)
Development of public and private forest policy in the United States; administrative and executive tasks in forestry; principles of organization, personnel management, and budget. Prerequisite: Senior standing.

For 407—Forest Regulation—4 cr. (3 and 3)
Correlation of production factors and yields of forests; normal and empirical forests; rotations and cutting cycles; regulation of cuts and growing stock in sustained yield management. Prerequisite: For 302, 303.

For 408—Forest Valuation—3 cr. (3 and 0)
Capital investments in forestry and the returns derivable from them; valuation of land, timber, and other resources associated with forestry; appraisal of damage and stumpage values. Prerequisite: For 304, 407.

For 501—Data Processing in Forestry Problems—3 cr. (2 and 3)
For 502—Dendrometry—3 cr. (2 and 3)
For 503—Photo-Interpretation—3 cr. (2 and 3)
For 504—Forest Economics—3 cr. (2 and 3)
For 505—Cost Studies in Harvesting and Processing—3 cr. (2 and 3)
For 506—Multiple Use Management—3 cr. (3 and 0)
For 507—Special Problems in Forestry—Credit to be arranged.
For 591—Research—3 cr.
For 592—Research—3 cr.

FRENCH

Mr. Dean, Mr. Brannock, Miss Risko, Mrs. Wagner

Fr 101—Elementary French—3 cr. (3 and 1)
A course for beginners in which, through conversation, composition and dictation, the fundamentals of the language are taught and a foundation is provided for further study and the eventual ability to read and speak the language. Three hours a week of classroom instruction and one hour a week in the language laboratory.

Fr 102—Elementary French—3 cr. (3 and 1)
A continuation of Fr. 101, in which a reader is also used.

Fr 201—Intermediate French—3 cr. (3 and 1)
A short review of grammar, with conversation, composition and dictation continued from Fr 102, and the beginning of more serious reading of French prose in short stories or novels. Three hours a week of classroom instruction and one hour a week in the language laboratory.

Fr 202—Intermediate French—3 cr. (3 and 0)
While attention is paid to writing and speaking French, more stress is laid on the rapid reading of more difficult French prose than in the earlier courses.

Fr 303—Survey of French Literature I—3 cr. (3 and 0)
Literary movements and authors from the beginnings to the eighteenth century. Required of French majors. Prerequisite: Fr 201 and 202.
FR 304—SURVEY OF FRENCH LITERATURE II—3 cr. (3 and 0)
Literary movements and authors of the nineteenth and twentieth centuries. Required of French majors. *Prerequisite:* Fr 201 and 202.

FR 305—CONVERSATIONAL FRENCH—3 cr. (3 and 0)
Practice in the spoken language, with stress on vocabulary building, pronunciation, intonation, and comprehension; written work to increase accuracy. Assignments in the language laboratory. Required of French majors. *Prerequisite:* Fr 201 and 202.

FR 306—ADVANCED CONVERSATION AND COMPOSITION—3 cr. (3 and 0)
A continuation of Fr 305, with additional emphasis on written composition. Required of French majors. *Prerequisite:* Fr 305.

FR 403—TWENTIETH CENTURY PROSE—3 cr. (3 and 0)
The outstanding authors of the first half of the twentieth century: Proust, Gide, Mauriac, Saint-Exupéry, Sartre, Camus, and others. Reading of selected works, discussions, and reports. *Prerequisite:* Fr 303 and 304.

FR 404—TWENTIETH CENTURY DRAMA—3 cr. (3 and 0)
The French theater since 1900, with emphasis on the period after 1930. Readings, discussions, and reports. *Prerequisite:* Fr 303 and 304.

FR 405—NINETEENTH CENTURY FRENCH ROMANTICISM—3 cr. (3 and 0)
The romantic movement as expressed in the works of Chateaubriand, Hugo, Merimée, Vigny, Stendahl, Sand, and others. Readings, discussions, and reports. *Prerequisite:* Fr 303 and 304.

FR 406—NINETEENTH CENTURY FRENCH REALISM—3 cr. (3 and 0)
Realism as expressed in the works of Balzac, Flaubert, Daudet, Maupassant, Zola, and others. Selected works, discussions, and reports. *Prerequisite:* Fr 303 and 304.

FR 407—EIGHTEEN CENTURY FRENCH LITERATURE—3 cr. (3 and 0)
The principal literary figures of the eighteenth century, with particular emphasis on Voltaire and Rousseau. Selected works, discussions, and reports. *Prerequisite:* Fr 303 and 304.

FR 408—SEVENTEEN CENTURY FRENCH DRAMA—3 cr. (3 and 0)
The French classical drama, with emphasis on Corneille, Racine, and Molière. Selected works, discussions, and reports. *Prerequisite:* Fr 303 and 304.

GENETICS

Mr. C. M. Jones Mr. Boling

GEN 302—GENETICS—3 cr. (2 and 3)
A general coverage of the basic principles of genetics. Examples illustrating the fundamentals of heredity and variation are given for plants and animals, including man. *Prerequisite:* Bot 101 and Zool 101, 103 or consent of instructor.

GEN 451—GENETICS—3 cr. (3 and 0)
Methods and concepts in classical and modern genetics. Topics will include advanced studies of linkage; variations in chromosome number and structure; natural and induced mutations; extranuclear inheritance; experimental evolution; population, biochemical and medical genetics. Principles will be illustrated
by examples from plants, animals (including man), and microorganisms. **Prerequisite:** Gen 302. (To receive graduate credit, Gen 453 must be taken concurrently.)

**Gen 453—Genetics Laboratory—1 cr. (0 and 3)**  
Laboratory exercises will enable students to gain experience in cytogenetical investigations, population, quantitative, and biochemical genetics. Materials and techniques commonly used in genetic investigations will be introduced. **Prerequisite:** Gen 451 (may be taken concurrently).

**Gen 501—Cytogenetics—3 cr. (2 and 3)**

**GEOGRAPHY**  
**Mrs. Bardsley**

**Geog 301—Economic Geography—3 cr. (3 and 0)**  
The geographic conditions fundamental to the world’s resources—agricultural, mineral, commercial and industrial, and the conditions which affect their production, exchange, consumption and strategic significance. **Prerequisite:** Junior standing.

**Geog 302—Political Geography—3 cr. (3 and 0)**  
The geographical pattern of the major nations, empires, dominions, commonwealths and other dependencies, their boundaries, resources and strategic connections. The current principles of geopolities, with their application to the United States, Europe and Asia will be examined. **Prerequisite:** Junior standing.

**GEOLOGY AND MINERALOGY**  
**Mr. Brown, Mr. Birkhead, Mr. Griffin**

**Geol 201—Physical Geology—3 cr. (3 and 0)**  
A study of the minerals and rock which compose the earth’s crust, their origins and transformations. Emphasis is placed upon geological processes, both internal and external, by which changes are produced on or in the earth. **Prerequisite:** Registration in Geol 203.

**Geol 203—Physical Geology Laboratory—1 cr. (0 and 3)**  
Common minerals and rocks are studied. Instruction is also provided in the interpretation of geologic processes through study of topographic maps. Field trips provide direct observation of processes and results. **Prerequisite:** Geol 201 or registration in Geol 201.

**Geol 304—Historical Geology—3 cr. (3 and 0)**  
Evolution, both organic and inorganic, is traced from the beginning of the record up through the ages to the present. **Prerequisite:** Geol 201 and registration in Geol 305.

**Geol 305—Historical Geology Laboratory—1 cr. (0 and 3)**  
The student learns to recognize plants and animals which have left their record as fossils in the rocks of the earth’s crust. Emphasis is placed upon geologic structures and the interpretation of geologic maps. Field trips are planned to demonstrate classroom concepts. **Prerequisite:** Credit in Geol 304 or simultaneous registration in Geol 304.
Geol 306—Mineralogy—3 cr. (2 and 3)

The student gains a working knowledge of crystallography and a comprehensive knowledge of determinative mineralogy. Identification of the minerals is based on their physical and chemical properties. Prerequisite: Geol 201 or 406.

Geol 307—Optical Mineralogy—3 cr. (2 and 3)

The purpose of this course is to enable the student to identify minerals under the microscope on the basis of their optical properties. Prerequisite: Geol 306.

Geol 309—Petrology—3 cr. (2 and 3)

The genesis, evolution, and classification of rocks through lectures, laboratory exercises, and field trips. The occurrences, chemical relationships, and distribution of rock types are emphasized. Prerequisite: Geol 306.

Geol 311—Stratigraphy and Sedimentation—3 cr. (3 and 0)

The processes by which sediments are eroded, transported, and deposited (sedimentation), with major emphasis on relationships of the areal and time distribution of stratified rocks and their historical significances (stratigraphy). Prerequisite: Geol 201 and 304 or 406.

Geol 402—Structural Geology—3 cr. (3 and 0)

The diverse geological structures of the earth, their description, origin, and field recognition. Practical problems in interpreting geologic structures are utilized, in addition to theoretical considerations of the mechanics and causes of tectonism. Prerequisite: Geol 201 and 304 or 406.

Geol 403—Invertebrate Paleontology—3 cr. (2 and 3)

A study of life of past geologic ages, as shown by fossilized remains of ancient animals, with emphasis on the invertebrates. Prerequisites: Geol 201 and 304 or permission of the instructor.

Geol 404—Economic Geology—2 cr. (2 and 0)

This course concerns the description and classification of ore deposits and commercial non-metallic mineral deposits. The origin of mineral deposits and their occurrence is emphasized. Problem studies and field trips to nearby mines and quarries. Prerequisite: Geol 306.

Geol 406—Engineering Geology—3 cr. (2 and 3)

This course is similar to Geol 201 except that progress is faster and emphasis is on the relationship of geology to engineering.

Geol 411—Research Problems—3 cr. (0 and 9)

A field, laboratory, or library study of an approved topic in geology. The topic would be one not normally covered in formal course offering, but may be an extension of a course. Prerequisite: Senior standing in geology or approval of the Department Head.

Geol 412—Research Problems—3 cr. (0 and 9)

A continuation of Geol 411.

Geol 500—Earth Science I—3 cr. (2 and 3)

Geol 550—Earth Science II—3 cr. (2 and 3)
GERMAN

MR. HERLINGER, MRS. WANNAMAKER, MR. DRAKE

GER 101—ELEMENTARY GERMAN—3 cr. (3 and 1)
A course for beginners in which, through conversation, composition and dictation, the fundamentals of the language are taught and a foundation is provided for further study and the eventual ability to read and speak the language. Three hours a week of classroom instruction and one hour a week in the language laboratory.

GER 102—ELEMENTARY GERMAN—3 cr. (3 and 1)
A continuation of Ger 101, in which a reader is also used.

GER 201—INTERMEDIATE GERMAN—3 cr. (3 and 1)
A short review of grammar, with conversation, composition and dictation continued from Ger 102, and the beginning of more serious reading of German prose in short stories or novels. Three hours a week of classroom instruction and one hour a week in the language laboratory.

GER 202—INTERMEDIATE GERMAN—3 cr. (3 and 0)
While attention is paid to writing and speaking German, more stress is laid on the rapid reading of more difficult German prose than in the earlier courses.

GER 251—SCIENTIFIC GERMAN—3 cr. (3 and 0)
An alternate course to Ger 201, designed primarily to prepare graduate students for readings in general science with a thorough review of grammar and syntax. Prerequisite: Ger 101 and 102 and permission of the instructor.

GER 303—SURVEY OF GERMAN LITERATURE I—3 cr. (3 and 0)
Literary movements and authors from the beginnings through romanticism, with emphasis upon Goethe and his contemporaries. Required of German majors. Prerequisite: Ger 201 and 202.

GER 304—SURVEY OF GERMAN LITERATURE II—3 cr. (3 and 0)
Literary movements and authors from the end of romanticism to the present. Required of German majors. Prerequisite: Ger 201 and 202.

GER 305—CONVERSATIONAL GERMAN—3 cr. (3 and 0)
Practice in the spoken language, with emphasis on vocabulary, pronunciation, and comprehension; written exercises for accuracy; assignments in the language laboratory. Required of German majors. Prerequisite: Ger 102.

GER 306—ADVANCED CONVERSATION AND COMPOSITION—3 cr. (3 and 0)
Continuation of Ger 305 with additional emphasis on written composition. Required of German majors. Prerequisite: Ger 305.

GER 403—NINETEENTH CENTURY GERMAN LITERATURE—3 cr. (3 and 0)
Selected works of Heine, Hebbel, Grillparzer, Koller, Meyer, Hauptmann, Schnitzler, and Hofmannsthall. Readings, discussions, and reports. Prerequisite: Ger 305 and 304.

GER 404—20TH CENTURY GERMAN LITERATURE—3 cr. (3 and 0)
Selected works from authors of the twentieth century. Prerequisite: Ger 303 and 304.
GOVERNMENT

Mr. Tuttle, Miss Brown, Mr. Gordon, Mr. Owens

Gov 101—American National Government—3 cr. (3 and 0)
The principles, structure and functions of the national government of the United States. Not open to juniors and seniors.

Gov 301—American Government and Political Parties—3 cr. (3 and 0)
The constitution: powers and functions of executive, legislative and judicial branches; citizenship; expansion of governmental activities. A study of the nature, development, organization and methods of political parties, and the conduct of elections. Not open to those who have completed Gov 101.

Gov 302—State and Local Government—3 cr. (3 and 0)
The American state and local government structural features and functions, and their legislative, administrative and judicial processes.

Gov 303—Constitutional Development in the United States—3 cr.
(3 and 0)
The origin and growth of the Constitution of the United States.

Gov 401—Comparative Government—3 cr. (3 and 0)
Political institutions of Great Britain, Russia, France, Italy, Germany, Canada and Argentina. Prerequisite: Junior standing.

Gov 403—International Relations—3 cr. (3 and 0)
To acquaint the student with current world movements and conditions, so that he may be able to think intelligently on the problems confronting our nation. Prerequisite: Senior standing.

HISTORY

Mr. Lambert

Mr. Bolen, Mr. Lander, Mr. Landrith, Mrs. Ringold, Mr. Tuttle,
Mr. Amundson, Mrs. Bardsley, Mrs. Davis, Mrs. Hill,
Mr. Klevgard, Mr. Newell, Mrs. Owens,* Mr. Reel

Hist 101—American History—3 cr. (3 and 0)
The political, economic and social development of the American people from the period of discovery to the end of the Civil War.

Hist 102—American History—3 cr. (3 and 0)
The political, economic and social development of the American people from the end of the Civil War to the present.

Hist 104—Western Civilization—3 cr. (3 and 0)
A survey of the history of the modern world and the forces which have shaped its political, economic, and social institutions.

Hist 181—American History—3 cr. (3 and 0)
Same as Hist 101 except that this honors section is open to students only by invitation.

Hist 182—American History—3 cr. (3 and 0)
Continuation of Hist 181.

* On leave.
Hist 184—Western Civilization—3 cr. (3 and 0)
Same as Hist 104 except that this honors section is open to students only by invitation.

Hist 203—History of Civilization—3 cr. (3 and 0)
The political, economic and social movements of Western Civilization from ancient times to 1660. Prerequisite: Junior standing or permission of instructor.

Hist 204—History of Civilization—3 cr. (3 and 0)
The political, economic and social movements of Western Civilization from 1660 to the present. Prerequisite: Junior standing or permission of instructor.

Hist 301—History of the United States Since 1865—3 cr. (3 and 0)
An advanced study of the political, social, and economic development of the United States since the end of the Civil War. Prerequisite: Junior standing. Not open to students who have completed Hist 102.

Hist 306—American Economic Development—3 cr. (3 and 0)
The history of the economic development of the United States from 1492 to the present with emphasis on agriculture, transportation, banking, commerce, economic policies of the national government, and particularly the industrial revolution.

Hist 308—History of England to 1603—3 cr. (3 and 0)
The history of England to 1603.

Hist 309—History of England Since 1603—3 cr. (3 and 0)
England and her people. Prerequisite: Junior standing.

Hist 310—Ancient Civilization—3 cr. (3 and 0)
From beginning of civilization to A.D. 476.

Hist 312—History of Russia—3 cr. (3 and 0)
A survey of the history of Russia from the earliest times to the present.

Hist 313—History of South Carolina—3 cr. (3 and 0)
The political, economic and social development of South Carolina from 1670 up to the present. Prerequisite: Junior standing.

Hist 402—Medieval History—3 cr. (3 and 0)
A survey of the period from the eclipse of Rome to the advent of the Renaissance; emphasizing human migrations, feudalism, rise of towns, and the cultural life. Prerequisite: Hist 203 and 204.

Hist 403—History of the South—3 cr. (3 and 0)
Origins and development of political, economic, and cultural institutions of the South from the Colonial period to the present; and the role of the South in the nation's development.

Hist 408—International Relations Since 1914—3 cr. (3 and 0)
The great powers and world politics since 1914.

Hist 410—History of Colonial America—3 cr. (3 and 0)
The development of American institutions and customs in the period before 1776. Considerable emphasis is placed on the imperial relations between Great Britain and her colonies and upon the movement towards, and the philosophy of, the American revolution.
Horticulture 237

Hist 411—United States, 1783-1850—3 cr. (3 and 0)
The formation and growing pains of the new nation through the Federal and Middle periods of its history, with emphasis on economic and political development, the westward movement, and the conflicting forces of nationalism and sectionalism.

Hist 412—United States, 1850-1900—3 cr. (3 and 0)
A course dealing with the background causes of, developments during, and broad problems after, the Civil War in American history.

Hist 413—United States History Since 1900—3 cr. (3 and 0)
The history of the United States from 1900 to the present.

Hist 507—United States Diplomatic History Since 1877—3 cr. (3 and 0)

Hist 508—International Relations Since 1914—3 cr. (3 and 0)

Hist 511—Historiography and Seminar in United States History to 1850—3 cr. (3 and 0)

Hist 512—Historiography and Seminar in United States History Since 1850—3 cr. (3 and 0)

HORTICULTURE

Mr. Senn

Mr. Van Blaricom, Mr. Ogle, Mr. Sefick, Mr. Thode, Mr. Fulmer, Mr. Rothenberger, Mr. Sims, Mr. Stembridge

Hort 201—General Horticulture—3 cr. (2 and 3)
A working knowledge of the fundamental plant processes is developed, showing the influence of light, temperature, water and nutrients upon vegetative growth and reproduction of horticultural plants. Production practices, harvesting, storage and marketing of the principal fruit, vegetable and ornamental crops are discussed with demonstrations and practice in greenhouse and orchard. Prerequisite: Bot 101 and Ch 101.

Hort 302—Principles of Vegetable Production—3 cr. (2 and 3)
The general principles of vegetable growing and handling. Phases receiving special emphasis are economic importance, producing areas, management practices, plant forcing, cultural practices, irrigation, quality factors, harvesting, grading, packing, storage, market inspection, transportation, refrigeration, exhibition and seed production. Prerequisite: Hort 201.

Hort 303—Plant Materials I—3 cr. (2 and 3)
Woody, ornamental plants and their aesthetic and functional uses in landscape developments. The study covers habit of growth, ultimate size, texture effect, period of bloom, color, and cultural requirements.

Hort 304—Plant Materials II—3 cr. (2 and 3)
Herbaceous, ornamental plants which are commonly used as garden flowers. This study covers habit of growth, size, period of bloom, color and cultural requirements.
Hort 305—Plant Propagation—3 cr. (2 and 3)
Methods of propagation; time, manner and material for making cuttings; temperature and media for rooting cuttings or ornamental trees, shrubs and flowering plants; propagating structures, soils and fertilizers. Practical instruction given in field and greenhouse. Prerequisite: Hort 201.

Hort 308—Landscape Design—3 cr. (2 and 3)
Landscape planning of residential and public properties in order to achieve best use and most enjoyment from a given piece of ground. Prerequisite: Hort 303.

Hort 310—Floriculture—3 cr. (2 and 3)
Greenhouse production of commercial flower crops; soils; fertilizers; greenhouse diseases and insects; flower crops to be grown on benches and as pot plants; marketing and costs of production. Prerequisite: Hort 201.

Hort 352—Commercial Pomology—3 cr. (2 and 3)
Fruit bud formation, rest period and water relations of fruit plants, soils, fruit setting; orchard soil management and responses of various fruits to fertilizers; principles of pruning, effect of climatic differences, freezing of tissues and means of avoiding injury; harvesting, transportation and storage.

Hort 405—Nut Tree Culture—2 cr. (2 and 0)
The production, harvesting and marketing of the principal nut crops with emphasis on the pecan. Prerequisite: Hort 201.

Hort 406—Nursery Technology—3 cr. (2 and 3)
Principles and techniques in handling nursery crops. Prerequisite: Hort 303 and Hort 305.

Hort 407—Landscape Design—3 cr. (2 and 3)
The first half of this course is a study of trees, shrubs, vines and ground covers used in landscape planting. Attention is given to cultural requirements, growth habits, period of bloom, texture and fall color. The second half of the course is devoted to landscape planning for small residential properties.

Hort 409—Seminar—1 cr. (1 and 0)
Recent research work on various phases of horticulture, methods of conducting investigations, and preparation of report of investigations.

Hort 410—Seminar—1 cr. (1 and 0)
A continuation of Hort 409.

Hort 412—Turf Management—3 cr. (2 and 3)
The identification, use, culture, and maintenance of turf grasses.

Hort 451—Small Fruit Culture—3 cr. (2 and 3)
Varieties, soils, sites, culture, fertilizers, harvesting and preparation for marketing of grapes, strawberries, dewberries, blackberries, raspberries and other small fruits. Prerequisite: Hort 201.

Hort 456—Truck Crops—3 cr. (2 and 3)
The principles and practices employed in the commercial growing and marketing of vegetable crops. Emphasis is placed on temperature requirements, plant characteristics, varieties, soils, fertilizers, weed control, harvesting and preparation for market.
Hort 460—Advanced Landscape Design—5 cr. (3 and 6)
Landscape planning for larger residential properties, schools, industrial plants, real estate developments; detailed finished plans, costs; further study of materials used; original problems; field study. Prerequisite: Hort 308 or 407.

Hort 464—Food Preservation—3 cr. (2 and 3)
Theoretical background and fundamental processes of food preservation. Techniques used for community canning, commercial canning, frozen food preservation, juice manufacturing, jam and jelly making.

Hort 468—Introduction to Research—2 cr. (1 and 3)
Principles, developments and changes in research methods related to certain fields of agricultural research. The students obtain practice in experimental techniques, scientific writing and the use and maintenance of various research instruments and equipment. Prerequisite: Senior standing.

Hort 501—Problems in Small Fruit Production—3 cr. (3 and 0)
Hort 502—Advances in Horticulture—3 cr. (2 and 3)
Hort 503—Experimental Olericulture—3 cr. (3 and 0)
Hort 504—Scientific Advances in Ornamental Horticulture—3 cr. (3 and 0)

Hort 505—Quality Control for Horticulture Crops—3 cr. (2 and 3)
Hort 506—Post-Harvest Handling of Horticultural Crops—3 cr. (2 and 3)

Hort 507—Pomology—3 cr. (3 and 0)
Hort 508—Special Problems in Horticulture—2 cr. (2 and 0)
Hort 509—Seminar I—1 cr. (1 and 0)
Hort 510—Seminar II—1 cr. (1 and 0)

Hort 591—Research—3 cr.
Hort 592—Research—3 cr.

INDUSTRIAL EDUCATION
Mr. Laitala
Mr. Brock, Mr. Morgan, Mr. Newton

In Ed 201—Industrial Education Laboratory—2 cr. (1 and 3)
This course is the first of a series designed to provide the student with the opportunity to gain competency needed for the successful teaching of Industrial subjects. Emphasis is on basic understanding of terminology, materials, tools, machines, and processes used in industry.

In Ed 202—Industrial Education Laboratory—3 cr. (1 and 6)
The properties of wood and woodworking practices. Prerequisite: In Ed 201.

In Ed 301—Industrial Education Laboratory—3 cr. (1 and 6)
Metal layout and forming, molding, casting practices, and welding. Prerequisite: In Ed 202, EG 109, and Phys 202.
In Ed 302— Dwelling Materials and Construction Methods—2 cr. (1 and 3)
The commonly used building materials and the methods of combining them in present day construction. Prerequisite: In Ed 202.

In Ed 303—Industrial Education Laboratory—3 cr. (1 and 6)
Exploratory activities of a laboratory nature are concerned with typical circuits, rotating equipment, and electronics. Prerequisite: EE 303.

In Ed 304—Equipment Maintenance—1 cr. (0 and 3)
A course in preventive maintenance and repair of tools, machines, and equipment in the school laboratory. Prerequisite: In Ed 301 and EE 303.

In Ed 310—Methods of Trade Teaching—3 cr. (3 and 0)
This course is designed to give basic instruction to beginning teachers in trade work. Psychological factors of learning; individual differences; methods of teaching subjects; the special methods used in teaching skills; grading of students and keeping of proper records and reports. (Offered in Summer Sessions only.)

In Ed 312—Metal Processes in the General Shop—3 cr. (3 and 0)
Major emphasis is placed on planning and development of projects in wrought iron, sheet metal, art metal, metal spinning, welding, heat treating and other aspects of metal work that fit into a general shop program. (Offered in Summer Sessions only.)

In Ed 313—Ceramics and Allied Processes in the General Shop—3 cr. (3 and 0)
Planning and development of projects involving extrusion, forming, molding and oven treatment of clays in making brick, tile, stoneware and pottery. Allied materials and processes, such as glass making, blowing, coloring, and leading and molding are given some attention. (Offered in SummerSessions only.)

In Ed 314—Basic Electricity in the General Shop—3 cr. (3 and 0)
Major emphasis is placed on planning and developing projects involving an understanding of electrical principles as applied in electric circuits, electric motors, radio, television, telephony, and automatic controls involving vacuum tubes and other electronic devices and materials. (Offered in Summer Sessions only.)

In Ed 315—Construction Practices—3 cr. (3 and 0)
This course covers brick, tile, concrete, plastering, and other construction materials and methods. (Offered in Summer Sessions only.)

In Ed 316—Plastics and Plastic Processes in the General Shop—3 cr. (3 and 0)
The industrial, commercial and personal uses of plastics are discussed and demonstrated. In addition, the kinds of plastics, their properties, and special uses are studied. (Offered in Summer Sessions only.)

In Ed 317—Graphic Art Processes in the General Shop—3 cr. (3 and 0)
Major emphasis is placed on projects involving composing, proofing, letter press work, bed press work, block printing, silk screen printing, offset printing
and other processes in vogue at the present time. (Offered in Summer Sessions only.)

In Ed 318—Industrial Technology Techniques—3 cr. (3 and 0)
Major emphasis is placed on casting, stamping and forming processes, forging and extrusion processes, machining processes, metal spraying or metallurgy, blast cutting, heating and case hardening, assembly processes, bending, finishing processes, inspection gaging. (Offered in Summer Sessions only.)

In Ed 320—Machine Woodworking—2 cr. (1 and 3)
Basic characteristics of woodcutting, shaping, and finishing operations by use of machinery and auxiliary tools. Includes project work. Prerequisite: Junior standing. (Not for Industrial Education Students.)

In Ed 401—Industrial Education Laboratory—3 cr. (1 and 6)
Machining practices. Prerequisite: In Ed 303 and Math 106.

In Ed 402—Directed Teaching—6 cr. (1 and 15)
Supervised observation and teaching in cooperation with selected public schools in which opportunities are provided for securing experience in teaching industrial subjects. Prerequisite: In Ed 405, 416, 425, and grade-point ratio required for graduation.

In Ed 405—Tests and Measurements in Industrial Education—3 cr. (3 and 0)
Methods used in measuring and evaluating pupil achievement in Industrial Education subjects. Emphasis is on developing tests, project evaluation, standardized testing, and statistical treatment of test scores. Prerequisite: Math 303.

In Ed 416—Design and Operation of Industrial Education Laboratories—3 cr. (2 and 3)
Laboratory layout, selection and procurement of tools and equipment, budgeting, coordinating multiple activities in the general shop, and organizing course materials. Prerequisite: In Ed 303.

In Ed 422—Vocational Education Programs—3 cr. (3 and 0)
The types of vocational programs, financing, and administration and supervision. Prerequisite: In Ed 303.

In Ed 425—Teaching Industrial Subjects—3 cr. (3 and 0)
Effective methods and techniques of teaching industrial subjects. Emphasis is given to class organization, preparation of lesson outlines, and audio-visual aids. Prerequisite: Ed 335 and In Ed 303.

In Ed 432—Advanced Woodworking—2 cr. (1 and 3)
An advanced consideration of machine methods and developments, materials, quality factors, and evaluation of instructional materials and problems. Inspection trips and reports. Prerequisite: In Ed 302.

In Ed 435—Advanced Welding—2 cr. (1 and 3)
An advanced consideration of studies originated in In Ed 303, new developments, and evaluation of instructional materials and problems. Inspection trips and reports. Prerequisite: In Ed 301.
In Ed 436—Advanced Material Forming—2 cr. (1 and 3)
Advanced consideration of studies initiated in In Ed 301, developments, and evaluation of instructional materials and problems. Inspection trips and reports. Prerequisite: In Ed 301.

In Ed 438—Advanced Machining—2 cr. (1 and 3)
Advanced consideration of studies initiated in In Ed 401, new developments, industrial measurements, and evaluation of instructional materials and problems. Inspection trips and reports. Prerequisite: In Ed 401.

In Ed 441—Comprehensive General Shop Practices—2 cr. (1 and 3)
The problems and administration of the comprehensive general shop program. Objective is to consider planning multiple activity programs for the secondary school level. Prerequisite: In Ed 303.

In Ed 442—Competency Testing in Vocational Subjects—3 cr. (3 and 0)
This course is especially designed for trade teachers who have assisted in making trade tests for S. C. Certification program. Teachers who expect to assist in making trade tests are also urged to enroll in this course. The course is devoted to revising present trade tests and developing tests in new fields. (Offered in Summer Sessions only.)

In Ed 451—Problems in Vocational Education—3 cr. (3 and 0)
The expanding program of vocational education under the George-Barden Act and problems on national, state and local levels are discussed. Major specific problems involved in unit trade programs, out-of-school youth, selection and training of teachers, veterans’ training and others are covered. (Offered in Summer Sessions only.)

In Ed 496—Public and Industrial Relations for Vocational Teachers and Supervisors—3 cr. (3 and 0)
This course is to give vocational teachers the techniques and methods of effective public and industrial relations which will contribute to the understanding and cooperation of labor, business, professional, and industrial groups with the school program. (Offered in Summer Sessions only.)

In Ed 515—Seminar in Industrial Education—1 cr. (1 and 0)
In Ed 520—Recent Process Developments—3 cr. (3 and 0)
In Ed 540—School Shop Design—3 cr. (3 and 0)
In Ed 545—Curriculum Development in Industrial Education—3 cr. (3 and 0)
In Ed 561—Administration and Supervision of Vocational Education—3 cr. (3 and 0)
In Ed 591—Research in Industrial Education—3 cr.
In Ed 596—Research in Industrial Education—3 cr.
INDUSTRIAL ENGINEERING

MR. LAITALA

MR. CHISMAN, MR. COUCH, MR. DUNKLE, MR. MEEKS

IE 200—GEOMETRY CHANGING PROCESSES I—2 cr. (1 and 3)
An introductory study of geometry changing processes involving material removal, plastic deformation, casting, and joining. Studies include experimental, computational, instrumentation, and measurement projects. Unit operations investigated include applications of principles of mechanics, heat, electricity, wave motion, chemistry, and their combinations. Prerequisite: Phys 122, EG 109.

IE 201—GEOMETRY CHANGING PROCESSES II—2 cr. (1 and 3)
A continuation of IE 200. Prerequisite: IE 200.

IE 299—DIGITAL COMPUTATION—1 cr. (0 and 3)
An introduction to digital computer programming. Emphasis will be placed on computer language and its application to the solution of problems in industrial engineering.

IE 301—INTRODUCTION TO INDUSTRIAL ENGINEERING—3 cr. (3 and 0)
A systems analysis of engineering through critical study of governing criteria, modes of analysis, basic engineering plans, measures of engineering performance, interdependency of functional divisions of engineering, organization of the engineering process, and project administration. Prerequisite: IE 201 and Phys 222.

IE 302—METAL JOINING—2 cr. (1 and 3)
The weldability of metals; choice of equipment and welding materials; pre-treatment and after-treatment of welds; inspection and testing; the economics of welding; safety considerations. Prerequisite: EG 109 and Phys 222.

IE 303—JOB EVALUATION AND WAGE INCENTIVES—3 cr. (3 and 0)
An analysis of the mental and physical requirements, responsibilities and working conditions of jobs, and the several systems of determining the relative worth of jobs, including wage determination. Job evaluation plans and wage incentive systems and their maintenance. Prerequisite: IE 307 or IM 302.

IE 304—METHODS AND STANDARDS—3 cr. (2 and 3)
Fundamentals relating to individual work place analysis and design. Methods of reducing complex production systems into elemental operations. Principles of human motions. Fundamentals of measurement and their application to work measurement involving man and machine systems. Prerequisite: Phys 222 and Junior standing.

IE 306—PROCESS FUNDAMENTALS I—3 cr. (2 and 3)
Theoretical consideration of principles underlying application of engineering sciences to processes involving material removal, plastic deformation, casting and joining. Laboratory investigations are designed to provide experience in experimental design, data analysis, and report presentation. Prerequisite: MetE 302, EM 304 and 305, Math 313.

IE 307—SURVEY OF ENGINEERING—3 cr. (3 and 0)
An examination of engineering in terms of types of fundamentals employed, governing parameters, basic plans, basic engineering functions, organization of
divided engineering efforts, and measures of performance. Offered to students 
not majoring in engineering. **Prerequisite:** Phys 202 and Junior standing.

**IE 308—Industrial Applications of Statistics**—3 cr. (2 and 3) 
Application of statistical principles to analysis and control of production 
processes, studies of process capabilities, sampling inspection, work sampling, 
tolerance analysis, reliability analysis, and machine interference. **Prerequisite:** Math 313.

**IE 403—Process Fundamentals II**—3 cr. (2 and 3) 
Continuation of IE 306 and study of latest process developments. **Prerequi-
site:** IE 306, ME 304, EE 307.

**IE 404—Engineering Economic Analysis**—3 cr. (3 and 0) 
Analysis of differences between engineering alternatives involving materials, 
processes, projects, machines, etc., short and long term investments, machine 
replacement, elements of manufacturing cost and cost allocation, project cost 
estimating. **Prerequisite:** Senior standing in Engineering.

**IE 405—Process Fundamentals III**—3 cr. (2 and 3) 
Fundamentals of tool design. Methods of programming machines with special 
emphasis on numerical control. Economic and human aspects of automation. 
**Prerequisite:** IE 403, ME 315.

**IE 407—Quality Control**—3 cr. (3 and 0) 
Study and application of statistical methods to control the quality in man-
ufacture. Control chart fundamentals. Analysis of sampling plans and sampling 
tables. (For Engineering students not majoring in Industrial Engineering.) 
**Prerequisite:** Senior standing in Engineering.

**IE 408—Plant Design**—2 cr. (0 and 6) 
Integration of unit operations into a total production system. Study of 
analytical procedures for determining layout of production and other facilities, 
line balance, manner in which operations shall be linked or material moved 
between them. Creation and analysis of alternative designs. Fundamentals of 
plant location. **Prerequisite:** IE 403 and IE 414.

**IE 410—Engineering and Organization**—3 cr. (3 and 0) 
The nature of industrial enterprise in terms of purpose, organizational struc-
ture, governing criteria, responsibilities and relationships of various functional 
groups. Special emphasis is given to analysis, organization, and coordination of 
engineering functions. **Prerequisite:** Senior standing in Engineering.

**IE 411—Work Flow Systems and Control**—3 cr. (3 and 0) 
Fundamentals underlying the determination of production capacity require-
ments, economic lot sizes, and the regulating of flow and storage of materials 
to, within, and from the production system. Elements of forecasting, determi-
nation of materials requirements, scheduling, inventory control, etc. Consider-
ation of data processing methods. **Prerequisite:** IE 403 and IE 414.

**IE 412—Seminar**—1 cr. (1 and 0) 
Library search and oral reports covering recent technological developments 
in the field of industrial engineering. Consideration of professional responsi-
bilities and post graduation plans. A major term paper is required. **Prerequisite:** 
Senior standing in Industrial Engineering.
IE 413—Seminar—1 cr. (1 and 0)  
Continuation of IE 412. Prerequisite: IE 412.

IE 414—Methods of Operations Research I—3 cr. (3 and 0)  
An introduction to the mathematics required for a basic understanding of operational research techniques. Topics included are matrix algebra, linear algebra, vector spaces, transformations, discrete calculus, birth and death processes, stochastic processes, and Markov processes. Basic applications are presented. Prerequisite: IE 414 or consent of instructor.

IE 415—Methods of Operations Research II—3 cr. (3 and 0)  
A continuation of IE 414. Selected techniques of operation research are presented with applications to industrial and business areas emphasized. Topics included are constrained extremum, allocation, network theory, sequencing, inventory analysis, linear programming, and queuing theory. Prerequisite: IE 414 or Senior standing.

IE 416—Project Scheduling—3 cr. (3 and 0)  
Basic planning and plans underlying the design and control of work flow systems for diverse engineering projects. Systems design of schedule plans including design function, operations, materials procurement, facilities, equipment, etc. Fundamentals underlying critical path (PERT, C.P.M.) and data processing methods. (For Engineering students not majoring in Industrial Engineering.) Prerequisite: Senior standing in Engineering.

INDUSTRIAL MANAGEMENT

Mr. Whitehurst

Mr. Davis, Mr. Willis, Mr. Edel,* Mr. Park, Mr. Shuler,
Mr. Wannamaker, Mr. LaRoche, Mr. Richardson, Mr. Whay

IM 201—Introduction to Industrial Management—3 cr. (3 and 0)  
An introductory survey of management's role as a fourth factor of economic production. Fully one-third of the course is devoted to introducing the student to formal logic as an analytical tool in communication and decision making.

IM 301—Cost Accounting—3 cr. (3 and 0)  
The application of cost analysis to manufacturing and distributing problems. Analysis of the behavior characteristics of business costs and a study of principles involved in standard cost systems. Lectures and problems. Prerequisite: Acct 201 and 202.

IM 302—Industrial Management—3 cr. (3 and 0)  
Management problems and methods involved in the operation of manufacturing institutions, including location, equipment investment, organization structure, and budgets. Attention is given primarily to the above areas by the use of the case method. Emphasis on oral and written communication. Prerequisite: Junior standing.

IM 304—Quality Control—3 cr. (3 and 0)  
Basic control techniques in the field of industrial production, inspection and experimentation. Various sampling, control and inspection problems are studied with special reference to practical applications. Underlying theory, assumptions and limitations are presented. Prerequisite: Math 303.

* On leave.
IM 305—Income Taxation—3 cr. (3 and 0)
Interpretation of Federal Income Tax laws, regulations, and court decisions with practice in application of these laws to the returns of individuals, partnerships, and corporations. **Prerequisite:** Junior standing.

IM 306—Corporation Finance—3 cr. (3 and 0)
The organization and operation of corporations with emphasis on the nature and influences of the various sources of funds. **Prerequisite:** Junior standing.

IM 307—Personnel Management—3 cr. (3 and 0)
An introductory course dealing with the principles and policies governing present day employee-employer relationships. Attention directed to methods of electing, training, placing, and promoting of employees to develop sound personnel techniques. **Prerequisite:** Junior standing.

IM 308—Marketing—3 cr. (3 and 0)
An examination of the activities involved in the flow of goods and services from the producer to the consumer. A study of the basic functions of marketing and the problems involved in the operation of market institutions. Particular emphasis on the industrial phases of the above. **Prerequisite:** Econ 202.

IM 311—Introduction to Econometrics—3 cr. (3 and 0)
An application of modern statistical methods to economic theory formulated in mathematical terms. Emphasis is placed upon elementary mathematics, formulation of economic theory, application of calculus to economic theory, and statistical inference and its application to econometric models. **Prerequisite:** Math 200 and Econ 314.

IM 402—Production Planning and Control—3 cr. (3 and 0)
Methods of controlling the flow of personnel, machines and materials by means of scheduling, dispatching and routing. Includes a study of layout of equipment and facilities within the factory, and methods of materials handling. **Prerequisite:** Senior standing.

IM 403—Special Problems—2 cr. (2 and 0)
Each student will plan and develop a research project related to the field of management. **Prerequisite:** Senior standing in Industrial Management.

IM 404—Managerial Economics—3 cr. (3 and 0)
Includes an introduction to statistical decision theory, econometrics, and quantitative applications of economic tools in his role as decision maker and forward planner. **Prerequisite:** Econ 314 and Senior standing.

IM 405—Economics of Transportation—3 cr. (3 and 0)
History and structure of transportation systems of the United States; the nature of transportation costs and rates. Transportation systems as factors in industrial location. Government policy towards transportation. **Prerequisite:** Senior standing and permission of the instructor.

IM 406—Theory of Industrial Location—3 cr. (3 and 0)
A theoretical study of the general factors which determine plant location in a capitalist society. Particular attention would be paid to the selection of location sites by small nonbranch manufacturing plants. A comparison of location theory and actual location patterns would be stressed. **Prerequisite:** IM 405.
IM 407—Special Problems—1 cr. (1 and 0)
Each student will plan and develop a research project related to the field of management. Prerequisite: Senior standing in Industrial Management.

IM 408—Work Simplification and Standardization—3 cr. (2 and 3)
Principles and practices of motion and time as it is applied to industry. Emphasis is given to its application and its influence on methods, material handling, plant layout, and time study procedures. (For students not majoring in Engineering.)

IM 501—Quantitative Economic Analysis—3 cr. (3 and 0)
IM 502—Finance—3 cr. (3 and 0)
IM 503—Production Management—3 cr. (3 and 0)
IM 504—Managerial Policy—3 cr. (3 and 0)
IM 505—Quality Control—3 cr. (3 and 0)
IM 591—Thesis—3 cr.
IM 592—Thesis—3 cr.
IM 610—Seminar in Production Management—2 cr. (2 and 0)
IM 611—Seminar in Decision Theory—2 cr. (2 and 0)
IM 612—Seminar in Finance—3 cr. (3 and 0)

MATHEMATICS

Mr. Aucoin
Mr. Hind, Mr. Bell, Mr. Bethel, Mr. Brown, Mr. Coker, Mr. Flatt,
Mr. Harden, Mr. Hare, Mr. Kenelly, Mr. Kirkwood, Mr. LaGrone,
Mr. Luckawecki, Mr. Palmer, Mr. Park, Mr. Rife, Mr. Stanley,
Mr. Stuart, Mr. Sullivan, Mrs. Aucoin, Mrs. Dunkle,
Mr. Nicholson, Mrs. Bartmess, Mrs. Fulmer,
Mr. Prochaska

Math 100—College Algebra—2 cr. (5 and 0).
Required of all freshmen who fail to make a satisfactory grade on the Mathematics Test, Level I (Standard). An intensified review of high school algebra and the topics listed under Math 103. Students enrolled in Math 100 must receive a passing grade in this course before they are eligible to enroll in any other mathematics course. Math 100 may be substituted for Math 103.

Math 101—Mathematical Analysis—3 cr. (3 and 0)
An introductory course in college mathematics open only to students in the Bachelor of Arts curriculum and Pre-Medicine students. The subject matter includes graphing, differentiation, integration, solution of equations, trigonometry, exponential functions, series, and probability. Prerequisite: A satisfactory score on the Mathematics Test, Level I (Standard).

Math 102—Mathematical Analysis—3 cr. (3 and 0)
A continuation of Math 101.

Math 103—College Algebra—2 cr. (3 and 0)
Algebraic processes, functions, equations, inequalities, mathematical induction, theory of equations, determinants, and logarithms. Prerequisite: A satisfactory score on the Mathematics Test, Level I (Standard).
Math 104—Trigonometry—2 cr. (3 and 0)
Trigonometric functions, equations, identities, and solution of triangles. Logarithms and complex numbers. Prerequisite: A satisfactory score on the Mathematics Test, Level I (Standard).

Math 105—Algebra and Trigonometry—4 cr. (4 and 0)
A unified course in algebra and trigonometry. Prerequisite: A satisfactory score on the Mathematics Test, Level I (Standard).

Math 106—Analytic Geometry and Calculus I—4 cr. (4 and 0)
A unified course in analytic geometry and calculus presented in three semesters. Prerequisite: Math 103, 104 or 105 or a satisfactory score on the Mathematics Test, Level I (Standard).

Math 186—Analytic Geometry and Calculus I—4 cr. (4 and 0)
Same as Math 106 except that this honors section is open to students only by invitation.

Math 205—Analytic Geometry and Calculus II—4 cr. (4 and 0)
A continuation of Math 106.

Math 206—Analytic Geometry and Calculus III—4 cr. (4 and 0)
A continuation of Math 205.

Math 208—Engineering Mathematics I—4 cr. (4 and 0)
This course presents an introduction to the study of differential equations, linear algebra, complex variables, and the Laplace transforms. Prerequisite: Math 206.

Math 285—Analytic Geometry and Calculus II—4 cr. (4 and 0)
A continuation of Math 186.

Math 286—Analytic Geometry and Calculus III—4 cr. (4 and 0)
A continuation of Math 285.

Math 303—Statistics—3 cr. (3 and 0)
Descriptive statistics, elementary probability, sampling distributions, normal distribution, point and interval estimation, testing of hypotheses, correlation and regression. Prerequisite: Math 106.

Math 305—Foundations of Analysis—3 cr. (3 and 0)
An introduction to the language and use of symbolic logic and the properties of the real number system with applications to the calculus. Prerequisite: Math 206.

Math 306—Ordinary Differential Equations—3 cr. (3 and 0)
Linear equations with constant coefficients, simultaneous equations, linear equations of second order, series solutions, applications to physics and engineering. Prerequisite: Math 206.

Math 308—College Geometry—3 cr. (3 and 0)
Theorems and concepts more advanced than those of high school geometry. A treatment of the various properties of the triangle, including the notable points, lines, and circles associated with it. Prerequisite: Math 106.

Math 309—Engineering Mathematics II—3 cr. (3 and 0)
A continuation of Math 208. An introduction to Fourier Series, numerical methods, vector algebra, vector calculus, partial differential equations and certain special functions is given. Prerequisite: Math 208.
**Mathematics 249**

**Math 310—Programming the Digital Computer—3 cr. (2 and 3)**
Programming techniques for the RPC 4000. Assembly routines and the use of a compiler are included. **Prerequisite:** Math 206 or the permission of the instructor.

**Math 313—Engineering Statistics—3 cr. (3 and 0)**
Principal topics include: empirical distributions, random variables, probability distributions, normal distribution, chi-square distribution, t—distribution, F—distribution, test of hypothesis, estimation, fitting straight lines, analysis of variance. **Prerequisite:** Math 206.

**Math 386—Ordinary Differential Equations—3 cr. (3 and 0)**
Honors section in Math 306.

**Math 402—Theory of Probability—3 cr. (3 and 0)**
Principal topics include: combinatorial theory, random variables, expected values, jointly distributed random variables, correlation, conditional expectation, predictions, binomial distribution, poisson distribution, normal distribution, law of large numbers, central limit theorem, elementary markov chains.

**Math 403—Statistical Inference—3 cr. (3 and 0)**
Principal topics include: point estimation, linear hypothesis, correlation, regression, distribution free methods, sequential analysis. **Prerequisite:** Math 402.

**Math 404—Introduction to Stochastic Processes—3 cr. (3 and 0)**
Principal topics include—random variables, counting processes, stationary processes, ergodic processes, spectral distribution function, examples from scientific fields to indicate the use of stochastic processes in construction of models of physical and behavioral phenomena. **Prerequisite:** Math 402.

**Math 406—History of Mathematics—3 cr. (3 and 0)**
A survey of the development of mathematics. Use of reference material to supplement the text and class discussion is expected. **Prerequisite:** Math 206.

**Math 407—Partial Differential Equations—3 cr. (3 and 0)**
Partial differentiation and space geometry, origins of partial differential equations, linear and non-linear equations of the first order, Fourier series, linear equations of the second and higher orders. **Prerequisite:** Math 306.

**Math 408—Topics in Geometry—3 cr. (3 and 0)**
An introduction to topics in special geometries which include non-Euclidean space concepts, such as projective geometry, finite geometries, and intuitive elementary topology. A brief introduction to vector geometry. **Prerequisite:** Math 206.

**Math 409—Numerical Methods for Computers—3 cr. (3 and 0)**
Approximations to functions, roots of equations, difference methods, solutions to differential equations, numerical methods for linear systems. Algorithms for several methods are programmed for the computer. **Prerequisite:** Math 310.

**Math 411—Linear Algebra—3 cr. (3 and 0)**
An introduction to the algebra of matrices, vector spaces, polynomials and linear transformations. **Prerequisite:** Math 206.

**Math 412—Introduction to Modern Algebra—3 cr. (3 and 0)**
An introduction to the concepts of algebra. Topics included are the number system; elementary theory of groups; rings, integral domains, and fields;
matrices over a field; determinants and matrices; groups, rings, and ideals. **Prerequisite:** Math 206.

**Math 413—Introduction to Topology—3 cr. (3 and 0)**
An introduction to point set topology; Hausdorff, regular and normal spaces; metric connected and compact spaces; continuous mappings and homeomorphisms. **Prerequisite:** Math 305.

**Math 417—Mathematics Programs—3 cr. (3 and 0)**
Aspects of the new high school programs in mathematics. Open only to in-service teachers or students in the Mathematics Teacher Training Program. **Prerequisite:** Math 311; **corequisite:** Math 408.

**Math 427—Digital Computer Principles—3 cr. (3 and 0)**
General digital computer principles, symbolic logic, Boolean algebra, storage devices, mechanisms of arithmetic, input and output devices, relations between hardware and programming. **Prerequisite:** Math 305 and Math 310.

**Math 428—Artificial Languages—3 cr. (3 and 0)**
An introduction to methods for implementing artificial languages on computers. **Prerequisite:** Math 305 and Math 310.

**Math 429—Introduction to Numerical Analysis—3 cr. (3 and 0)**
Difference and summation calculus, round off noise, finite Fourier series, polynomial approximation, numerical solution of differential equations. **Prerequisite:** Math 306 or 208.

**Math 451—Vector Analysis—3 cr. (3 and 0)**
The algebra and calculus of vectors in two and three dimensions with applications to physics, geometry and engineering problems. **Prerequisite:** Math 306 and Junior standing.

**Math 452—Linear Programming—3 cr. (3 and 0)**
An introduction to linear programming, using elementary matrix algebra and the theory of convex polygons. Applications to managerial problems, operations research, economic behavior, the theory of games and military strategy are considered. **Prerequisite:** Math 206 or permission of the instructor.

**Math 453—Advanced Calculus I—3 cr. (3 and 0)**
Limits, continuity, and differentiation of functions of one and several variables, the Riemann integral, and vector analysis. **Prerequisite:** Math 306 and Junior standing.

**Math 454—Advanced Calculus II—3 cr. (3 and 0)**
A continuation of Math 453. Transformations, multiple integrals, line and surface integrals, infinite sequences and series, and improper integrals.

**Math 455—LaPlace Transforms—3 cr. (3 and 0)**
Elementary properties of transforms of real functions; development and use of tables of transforms and inverses; applications to ordinary differential equations and linear partial differential equations. **Prerequisite:** Math 306.

**Math 457—Applied Mathematics I—3 cr. (3 and 0)**
Determinants and matrices, review of differential equations, finite differences, Fourier series and integrals, Laplace transformations, a large selection of applications. **Prerequisite:** Math 306.
Math 458—Applied Mathematics II—3 cr. (3 and 0)
A continuation of Math 457. Partial differential equations, Bessel functions and Legendre polynomials, analytic functions of complex variables, infinite series in a complex plane, the theory of residues, conformal mapping. Prerequisite: Math 457.

Math 463—Mathematical Analysis I—3 cr. (3 and 0)
Basic properties of the real number system, sequences and limits; continuous functions, uniform continuity and convergence. Integration, differentiation, functions of several real variables, implicit function theory. Prerequisite: Math 305.

Math 464—Mathematical Analysis II—3 cr. (3 and 0)
A continuation of Math 463.

Math 501—Group Theory—3 cr. (3 and 0)
Math 502—Advanced Linear Algebra—3 cr. (3 and 0)
Math 503—Theory of Functions of Complex Variables I—3 cr. (3 and 0)
Math 504—Theory of Functions of Complex Variables II—3 cr. (3 and 0)

Math 505—Numerical Analysis—3 cr. (3 and 0)
Math 506—Calculus of Finite Differences—3 cr. (3 and 0)
Math 508—Fourier Series—3 cr. (3 and 0)
Math 509—Operational Mathematics—3 cr. (3 and 0)
Math 510—Real Variables I—3 cr. (3 and 0)
Math 511—Real Variables II—3 cr. (3 and 0)
Math 513—Stochastic Processes—3 cr. (3 and 0)
Math 514—Mathematical Statistics—3 cr. (3 and 0)
Math 515—Projective Geometry—3 cr. (3 and 0)
Math 516—Tensor Analysis—3 cr. (3 and 0)
Math 521—Functional Analysis I—3 cr. (3 and 0)
Math 522—Functional Analysis II—3 cr. (3 and 0)
Math 556—History of Mathematics—3 cr. (3 and 0)
Math 557—Theory of Numbers—3 cr. (3 and 0)
Math 590—Research—1 cr. (1 and 0)
Math 591—Research—3 cr.
Math 592—Research—3 cr.
MECHANICAL ENGINEERING

Mr. Lewis, Acting
Mr. Bradsbury, Mr. Cook, Mr. Edwards, Mr. Watson, Mr. A. C. Elrod,
Mr. Hammond, Mr. Hudson, Mr. McHugh, Mr. Perry,
Mr. Yang, Mr. W. C. Elrod, Mr. Johnson

ME 201—Engineering Design and Production—2 cr. (1 and 3)
Design philosophy applied to pragmatic and conceptual design problems. Design project in which function, form, proportioning of components, and cost considerations are integrated with material selection and processes of production. Methods of geometry change. Capabilities of production processes and machines. This course is taught jointly by the Department of Mechanical Engineering and the Department of Industrial Engineering. Prerequisite: EG 109 and Sophomore standing.

ME 214—Engineering Problems—1 cr. (0 and 3)
Designed to develop an analytical approach to the solution of engineering problems at an elementary level. Prerequisite: Sophomore standing, Math 208, Phys 222, EM 302, ME 299.

ME 299—Digital Computation—1 cr. (0 and 3)
An introduction to digital computer programming for students majoring in mechanical engineering. Emphasis is placed on the computer languages in use at Clemson University, and their application to the solution of simple problems in mechanical engineering. Prerequisite: Sophomore standing, enrollment in ME 214.

ME 304—Heat Transfer I—3 cr. (3 and 0)
A comprehensive study of the principles of heat transmission with applications to engineering problems. Special emphasis is given to the following topics: heat conduction in the steady and unsteady states; dimensional analysis of convection; free and forced convection; the combined effects of conduction, convection and radiation. Prerequisite: Junior standing, ME 311, or ChE 331, and Math 208.

ME 307—Mechanical Engineering Laboratory—1 cr. (0 and 3)
For those curriculums requiring one course in Mechanical Engineering Laboratory. The course is intended to illustrate mechanical engineering theory and to develop experimental technique. Experiments in the first and second laws of thermodynamics are covered. Prerequisite: ME 311.

ME 311—Engineering Thermodynamics I—3 cr. (3 and 0)
A study of thermodynamics as an engineering science. Topics stressed are the first and second laws of thermodynamics, properties of the pure substance, ideal gases, and gaseous mixtures. Prerequisite: Math 208, Phys 222, and Junior standing.

ME 312—Engineering Thermodynamics II—3 cr. (3 and 0)
A continuation of ME 311. Prerequisite: ME 311.

ME 313—Instrumentation and Measurements—1 cr. (0 and 3)
Principles of measurements, accuracy of instruments, and data analysis. Modern instruments for measuring and recording static and dynamic pressures, temperatures, fluid flow, speed, power, and torque. Prerequisite: Enrollment in ME 311, EE 308, EE 310.
ME 315—Kinematics of Mechanisms—3 cr. (2 and 3)
Kinematic analysis of mechanisms to include analysis of displacement, velocity, and accelerations. Gears, cams, and trains of mechanisms. Linkages, including synthesis of linkages. Application of computer methods to linkage design. Analysis of space mechanisms. Prerequisite: EM 202.

ME 318—Dynamic Analysis of Machines—3 cr. (2 and 3)

ME 401—Principles of Mechanical Engineering Design—3 cr. (3 and 0)
Philosophy of engineering design; decision theory in design. Introduction to Optimum Design Techniques, feasibility studies, stress and strength considerations in design, deflection analysis. Design factors, cost, material selection, reliability. Creative problems are assigned to implement application of principles of design. Prerequisite: ME 315, ME 318, EM 304, Senior standing, concurrent registration in CrE 310.

ME 402—Mechanical Engineering Analysis and Design—5 cr. (3 and 6)
The student is given the opportunity to apply creatively his general knowledge and his knowledge of engineering in the analysis and design of one or more engineering systems, machines, or devices. Problems may be selected from two sources: A meritorious problem of the student’s own choice or a problem assigned by appropriate authority. Prerequisite: ME 401.

ME 403—Gas Dynamics—3 cr. (3 and 0)
Basic concepts, fundamental equation of steady flow, isentropic flow, flow with heat transfer, flow with friction, wave phenomena, variable area flow and introduction to multidimensional flow. Prerequisite: ME 312, EM 320, Senior Engineering standing.

ME 404—Automatic Control Engineering—4 cr. (3 and 3)
Steady state and transient behavior of linear system utilizing Laplace transforms, root locus plots, and frequency response methods. Hydraulic and pneumatic systems. Accompanying laboratory for systems analysis, performance studies, simulation, and control systems experiments utilizing the analog computer, the digital computer, and the spiral. Prerequisite: EE 308, Math 208, ME 318.

ME 407—Heat Transfer II—3 cr. (3 and 0)
An engineering science course dealing with the transfer of energy. This course is designed to supplement and extend the material covered in ME 304. A rigorous study of conduction, convection, and radiation including transient and periodic heat transfer and an introduction to mass and momentum transport phenomena. Prerequisite: ME 304, Math 208, and Senior standing.

ME 408—Design of Machine Elements—3 cr. (2 and 3)
Design of machines and machine components, including analysis synthesis, layout, and reports. A synthesis course with emphasis on making decisions. Prerequisite: ME 401.
ME 411—Gas Power—4 cr. (3 and 3)
A senior synthesis course designed to apply basic thermodynamics through process analysis. A study of the effects of variation in specific heat, some fundamentals of compressible flow, the combustion process, and chemical dissociation. The theoretical and actual processes associated with the gas turbine, the thermal jet, the thermal rocket, and the spark ignition and compression ignition reciprocating engines are analyzed with the use of charts and tables. Experiments applicable to the theory constitute the laboratory. Prerequisite: ME 312 and Senior Engineering standing.

ME 412—Steam Power—3 cr. (2 and 3)
A senior synthesis course designed to apply the basic and engineering sciences. Topics stressed are the design, arrangement and economic justification of steam power plant equipment. Prerequisite: ME 304, 312, and Senior standing.

ME 421—Propulsion Systems I—3 cr. (3 and 0)
A senior synthesis course designed to add depth to the fundamentals given in ME 411. Detailed analysis of the thermochemical processes and the associated effects of chemical dissociation. A study of the energy and entropy relation based upon the datum of absolute zero degree Rankine. Charts are used for analysis. Prerequisite: ME 411 or the equivalent.

ME 422—Principles of Turbomachinery—3 cr. (2 and 3)
The guiding principles underlying all forms of turbomachinery. A unified treatment of turbomachinery to include pumps, fans, compressors and steam, gas and hydraulic turbines. Dimensional analysis as applied to turbomachinery, Euler's Equation, concepts of specific speed and thermodynamics of turbomachinery processes and allied topics are covered. Prerequisite: ME 312, EM 320, and Senior standing.

ME 423—Propulsion Systems Analysis—1 cr. (0 and 3)
An analysis course designed to parallel ME 421. Employing the basic theory associated with ME 421, analyses are made of selected basic concepts. General procedures for specific methods of analysis are studied. Prerequisite: ME 421 or equivalent or enrollment in ME 421.

ME 429—Air Conditioning—3 cr. (3 and 0)
A senior synthesis course designed to apply the principles of the applicable phases of the basic and engineering sciences. A study of the principles of heating and air conditioning, including calculation of heat loss and heat gains for buildings, heating and cooling systems, psychrometric principles, air distribution, refrigeration and automatic control apparatus. Prerequisite: ME 304, 312, and Senior standing.

ME 430—Air Conditioning Design—1 cr. (0 and 3)
An application of the theory covered in ME 429 to the design of air-conditioning systems. Prerequisite: Enrollment in ME 429.

ME 431—Air Conditioning Laboratory—1 cr. (0 and 3)
Selected experiments and problems designed to illustrate and amplify the theory of air conditioning. Prerequisite: Enrollment in ME 429.

ME 433—Elementary Aerodynamics—3 cr. (3 and 0)
The flow of incompressible inviscid fluids in two dimensions. The vector flow field, Gauss's Theorem, Stoke's Theorem, the velocity potential and stream
function. Euler's Equation applied to incompressible fluids, superposition of flows. Method of conformal mapping and non-steady incompressible flow problems. Prerequisite: ME 312, EM 320.

ME 434—REFRIGERATION—2 cr. (2 and 0)
A thermodynamic analysis of the principles of refrigeration; a study of the design, operating principles and application of compression, absorption and steam jet systems of refrigeration. Prerequisite: ME 304 and ME 312.

ME 435—REFRIGERATION LABORATORY—1 cr. (0 and 3)
Selected experiments and design problems in the field of refrigeration. Prerequisite: Enrollment in ME 434.

ME 464—LUBRICATION—2 cr. (2 and 0)
Application of hydrostatic and hydrodynamic theory to the design and analysis of journal and thrust bearings. Lubrication of ball and roller bearings. Lubricating materials. Lubricating systems. Prerequisite: ME 401.

ME 501—THERMAL ENVIRONMENTAL ENGINEERING—3 cr. (3 and 0)
ME 510—ADVANCED THERMODYNAMICS—3 cr. (3 and 0)
ME 511—GAS DYNAMICS II—3 cr. (3 and 0)
ME 512—BOUNDARY LAYER THEORY I—3 cr. (3 and 0)
ME 513—GAS DYNAMICS III—3 cr. (3 and 0)
ME 514—HYPERSONICS—3 cr. (3 and 0)
ME 515—KINETIC THEORY OF GASES—3 cr. (3 and 0)
ME 524—PROPELLION SYSTEMS—3 cr. (3 and 0)
ME 532—APPLIED HEAT TRANSFER—3 cr. (3 and 0)
ME 534—ADVANCED HEAT TRANSFER—3 cr. (3 and 0)
ME 540—KINEMATICS II—3 cr. (3 and 0)
ME 591—RESEARCH—3 cr.
ME 592—RESEARCH—3 cr.
ME 612—BOUNDARY LAYER THEORY II—3 cr. (3 and 0)
ME 614—MAGNETOHYDRODYNAMICS—3 cr. (3 and 0)
ME 615—ENERGY CONVERSION—3 cr. (3 and 0)
ME 630—CONDUCTION HEAT TRANSFER—3 cr. (3 and 0)
ME 631—CONVECTION HEAT TRANSFER—3 cr. (3 and 0)
ME 632—RADIATION HEAT TRANSFER—3 cr. (3 and 0)
MEDICAL TECHNOLOGY

Mr. Dreskin, Mr. Kilgore, Mr. Waters, Mr. Ludvigsen, Mr. Potts

**MED Tech 401—Serology and Immunology—4 cr. (21,10,49)**

Presents the basic principles of serology and immunology and the tests utilizing these principles to detect abnormalities helpful in the diagnosis of disease.

**MED Tech 402—Microbiology—7 cr. (59,6,470)**

The principles of microbiology-bacteriology, mycology, and parasitology. Emphasis is placed on human pathogenic organisms, using both fresh and prepared organisms.

**MED Tech 403—Hematology—5 cr. (12,32,276)**

Information on blood as a tissue, the theory of hematological tests, factors that affect test reliability. Knowledge of test results and knowledge of blood dyscrasias. Skill in the performance of hematological tests is emphasized and the use of automation techniques is covered.

**MED Tech 404—Blood Bank—3 cr. (8,20,132)**

History and principles of blood group systems and methods of cross matching. Testing for, and quantitative determination of, Rh antibodies with all available techniques. Selection, pre-testing and bleeding of donors and processing of blood for transfusions.

**MED Tech 405—Cytology—1 cr. (2,12,26)**

An introduction to cytology and cytologic techniques in the diagnosis of cancer. Definition and brief history, sources of material, collection and preservation of specimens, together with practice in interpretation.

**MED Tech 406—Histology—3 cr. (20,30,190)**

Histologic preparation, including actual preparation of tissue specimens derived from surgical procedures and autopsies. Routine and special staining, together with experience using the Cryostat.

**MED Tech 407—Urinalysis—2 cr. (10,8,102)**

The study of renal function together with principles of urine analysis, pregnancy tests and anatomy of the urinary system. Emphasis is placed on laboratory procedures and their utilization to detect abnormalities helpful in the diagnosis of disease.

**MED Tech 408—Chemistry—10 cr. (40,50,470)**

Introduction to the chemistry of carbohydrates, nitrogen, calcium, and phosphorus compounds, acid-base balance, etc., with emphasis on the chemistry of blood and urine using both qualitative and quantitative procedures in the laboratory.

**MED Tech 409—Radioisotopes—1 cr. (2,0,7)**

Introduction to principles of diagnostic radioisotope procedures and the use of the scintillation detector, the well counter, and the scaler.

*First figure represents lecture hours, second figure represents seminar hours, and the third figure represents clinical practice hours.*
METALLURGICAL ENGINEERING

Mr. Venkatu, Mr. Young

**METE 202—INTRODUCTION TO METALLURGY—3 cr. (3 and 0)**
A survey of the field of metallurgical operations, extractive, mechanical and physical. Designed to acquaint the student with the various fields of operation and provide basic information for more advanced courses.

**METE 220—EXTRACTIVE METALLURGY—3 cr. (3 and 0)**
The processes used to reduce ore to metal. This course is a survey of both the ferrous and non-ferrous extractive processes. Pyrometallurgical, electro-metallurgical and hydrometallurgical processes will be studied.

**METE 301—PHYSICAL METALLURGY—3 cr. (2 and 3)**
The first of two sequential courses to acquaint the student with the nature and properties of metals. The properties of metals are defined and studied in terms of solid state physics which explains how and why metals have the useful properties that they do possess. Basic metal forming processes involving these principles are studied. **Prerequisite:** MetE 202 or 302.

**METE 302—GENERAL METALLURGY—3 cr. (2 and 3)**
Basic general metallurgy for students in Engineering and related curriculums. This course is designed to acquaint students with the properties of metals so that they may select intelligently for engineering applications. The nature of metals and of metal working processes are considered. **Prerequisite:** Junior standing in Engineering.

**METE 304—PHYSICAL METALLURGY—3 cr. (2 and 3)**
A continuation of MetE 301. In this portion of the course alloys are considered particularly. The use of an alloy diagram to represent properties and phases is studied. The student learns to interpret and construct these diagrams. Solid state phase changes are studied, such as occur in the heat treating of steel and the age hardening of aluminum alloys. **Prerequisite:** MetE 301.

**METE 320—MECHANICAL METALLURGY—2 cr. (2 and 0)**
The processes whereby useful shapes are formed in metal, and the response of the metal to the deformative forces. Rolling, forging, extrusion, drawing and “high energy” deformations are studied. The effects of these forces on the character and properties of the metal are evaluated. **Prerequisite:** MetE 304 or consent of instructor.

**METE 323—METALLOGRAPHY—2 cr. (1 and 3)**
The development of techniques necessary for metallographic investigations. The selection, cutting, mounting and polishing of specimens; the use of the microscope; the techniques of etching, and of photography. Training in the use of laboratory equipment in evaluating metallic material. **Prerequisite:** MetE 304, or MetE 302 and consent of instructor.

**METE 350—METALLURGY OF CAST METALS—3 cr. (2 and 3)**
The fundamentals of melting, fluxing, pouring, and the control of the solidification of metals in molds. The metallurgical aspects of the production of all kinds of castings—sand mold, permanent mold, shell mold, die casting, and centrifugal casting. Studies are made of the physical properties of castings. **Prerequisite:** MetE 302 or MetE 304.
**MetE 402—Metallurgical Literature—1 cr. (0 and 3)**
To acquaint students with sources of information on metallurgy and to develop a background for the senior thesis. *Prerequisite:* Senior standing in Metallurgical Engineering.

**MetE 408—Heat Treating—3 cr. (2 and 3)**
The phase changes in both ferrous and non-ferrous metals caused by changes in environment at significant times in the processing. Studies relating the time-temperature changes in metals with their physical properties. *Prerequisite:* MetE 302 or MetE 304.

**MetE 425—Senior Thesis—2 cr. (0 and 6)**
The independent investigation of a project in Metallurgical Engineering. A competent bachelor thesis is required. *Prerequisite:* Senior standing in Metallurgical Engineering.

**MetE 430—Powder Metallurgy—3 cr. (2 and 3)**
The production of metal powders and of articles from these powders. By powder metal techniques it is possible to produce controlled porosity, unconventional alloys and to produce complex parts of limited size rapidly, accurately, and economically. Combinations of metals and non-metals may be produced. *Prerequisite:* MetE 302 or MetE 304.

**MetE 440—Metallurgy of Reactor Materials—3 cr. (2 and 3)**
The metallurgy of materials used in reactor construction. The physical metallurgy of metallic fuels, controls, reflectors, and shielding. The effects of radiation on structural metals will be considered. *Prerequisite:* Senior standing and the consent of the instructor.

**MetE 450—Metallic Corrosion—3 cr. (2 and 3)**
The corrosion of metallic materials and means of preventing such corrosion. Environmental factors in corrosion are considered. *Prerequisite:* MetE 302 or MetE 304.

**MetE 455—Electrometallurgy—3 cr. (2 and 3)**
The electrowinning and electrorefining of metals. Electrothermic cells will be studied. The principles and operation of electric furnaces will be considered. Electroplating, electroetching and electromachining will be studied. *Prerequisite:* MetE 302 or MetE 304 and EE 308.

**MetE 502—Research Techniques in Physical Metallurgy—2 cr. (1 and 3)**

**MetE 505—Physical Metallurgy I—3 cr. (3 and 0)**

**MetE 506—Physical Metallurgy II—3 cr. (3 and 0)**
MILITARY SCIENCE

Colonel Brown

Maj. Jackson, Maj. Reinken, Maj. Wright, Capt. Coker,
Capt. Ferguson, Capt. Hoey, Capt. Roberts,
Sgt. Maj. Burton, M/Sgt. Barnard,
SFC Griffin

MS 101—FUNDAMENTALS (Basic)—1 cr. (2 and 1)
Introduction to organization, equipment, and mission of Reserve Officers
Training Corps and the U. S. Army, with detailed study of smaller units and
basic aims and discussion seminar on current events. Laboratory periods
provide training in basic drill, discipline, and leadership.

MS 102—ARMY AND NATIONAL SECURITY (Basic)—1 cr. (2 and 1)
Organization of Department of Defense, roles and missions of the Armed
Forces with particular emphasis on U. S. Army. Effects of modern weapons,
including chemical, biological, and radiological, with sub-course on mass casu-
alty treatment, first aid, and effective communication. Current events seminar.
Drill.

MS 201—AMERICAN MILITARY HISTORY (Basic)—1 cr. (2 and 1)
A survey of American military history from the origins of the American
Army to the present, with emphasis on the factors which led to the organi-
zational, tactical, logistical, operational, strategic, social, and similar patterns
found in our present-day Army.

MS 202—INTRODUCTION TO OPERATIONS AND BASIC TACTICS AND MAP AND
AERIAL PHOTOGRAPH READING (Basic)—1 cr. (2 and 1)
An introduction to the organization, composition, and mission of the infantry
rifle squad and small infantry-tank teams. Interpretation and use of maps and
aerial photographs in study and evaluation of terrain.

MS 301—MILITARY SCIENCE (Advanced)—3 cr. (3 and 1)
Theoretical and practical training in the responsibilities and basic qualities
of a leader; educational techniques and psychology; and the roles of the combat
arms and service branches of the Army; and counter-insurgency operations.
Further training for duty as officers by application of principles of leadership
in actual command during drills, parades, reviews, inspections and ceremonies.

MS 302—MILITARY SCIENCE (Advanced)—3 cr. (3 and 1)
Study and practical application of the techniques of organization, control,
and employment of military units with particular attention to the application
of leadership principles in directing small tactical units. A study of the methods
of communication. Additional leadership training.

MS 401—MILITARY SCIENCE (Advanced)—3 cr. (3 and 1)
A study of advanced subjects of leadership command and staff, which when
related with other college courses and disciplines, will develop the individual
character and attributes essential to an officer. Applicatory phases of leadership
are stressed throughout.

MS 402—MILITARY SCIENCE (Advanced)—3 cr. (3 and 1)
The functions of staff and command. Aspects of military service which help
student adjust to requirements of active duty as an officer in the United States
Army. Student participation emphasized.
MUSIC

Mr. McGarity, Mr. Butler

Music 310—Music Appreciation: Music in the Western World—3 cr. (3 and 0)
Designed to widen and deepen the student’s appreciation of his musical heritage through a study of the development of music in Western culture from the time of the early Christians to the present. Not open to students who have taken Music 402.

Music 400—Music in the Elementary School Classrooms—3 cr. (3 and 0)
Designed to give the teacher in the elementary school a familiarity with music suitable for use with children at the elementary level. Recordings of appropriate music, pre-band instruments, unison and part singing will be included. No previous training in music is required. (Offered in Summer Sessions only.)

Music 405—Music Theory—3 cr. (3 and 0)
The principles of notation, its symbols and abbreviations, major and minor scales, intervals and chords, measure, rhythm and tempo, and the terminology of music are the principal topics covered in this course.

Music 411—American Music: Music Appreciation—3 cr. (3 and 0)
Music in America from 1620 to the present. Indigenous and borrowed influences will be examined.

NUTRITION

Mr. Barnett, Mr. W. A. King, Mr. R. F. Wheeler, Mr. W. P. Williams
(See courses listed under Animal Science, Biochemistry, Dairy Science, Food Science, and Poultry Science)

Nutr 551—Nutrition Seminar I—1 cr. (1 and 0)
Nutr 552—Nutrition Seminar II—1 cr. (1 and 0)
Nutr 591—Research—3 cr.
Nutr 592—Research—3 cr.
Nutr 691—Doctoral Research—Credit to be arranged

PHILOSOPHY

Mr. Ware

Phil 301—Introduction to Philosophy—3 cr. (3 and 0)
An analysis of the major problems and systems of philosophy. Prerequisite: Junior standing and permission of instructor.

Phil 302—Logic—3 cr. (3 and 0)
An introduction to the methods and techniques of logic and continuing to elementary symbolic logic.
PHYSICS
MR. HUFF
MR. J. E. MILLER, MR. C. A. REED, MR. D. P. MILLER, MR. A. R. REED,
MR. SKOVE, MR. STILLWELL, MR. VOGEL, MR. WOOD, MR. CHAPLIN,
MR. COLLINS, MR. GETTYS, MR. GING, MR. GRABEN,
MR. M. G. MILLER, MR. GILREATH *

PHYS 122—MECHANICS AND WAVE PHENOMENA—3 cr. (3 and 0)
Vectors; laws of motion; rotation; vibratory and wave motion; mechanical
properties of materials. Prerequisite: Registration in Math 205.

PHYS 132—GENERAL PHYSICS FOR PHYSICS MAJORS—3 cr. (3 and 0)
Introduction to physical quantities, linear and rotational motion, conservation
laws, gravitational and electric fields, and kinetic theory. Prerequisite: Regis-
tration in Math 106 and Phys 133.

PHYS 133—EXPERIMENTAL PHYSICS FOR PHYSICS MAJORS—1 cr. (0 and 3)
Introduction to techniques of measurement, experimental apparatus, errors
and data analysis. An experimental basis for Phys 132. Prerequisite: Regis-
tration in Phys 132.

PHYS 182—MECHANICS AND WAVE PHENOMENA—3 cr. (3 and 0)
Honors section of Phys 122. Open by invitation only.

PHYS 201—GENERAL PHYSICS—3 cr. (3 and 0)
Motion; equilibrium; the conservation of momentum, mass and energy; vibra-
tions; waves; temperature and heat. Prerequisite: Registration in Phys 203.

PHYS 202—GENERAL PHYSICS—3 cr. (3 and 0)
A continuation of Phys 201: Optics of lenses and mirrors; light waves;
electric charges and currents, magnetism, electric and magnetic fields; prop-
erties of atomic particles; structure of atoms. Prerequisite: Phys 201 and
registration in Phys 204.

PHYS 203—GENERAL PHYSICS LABORATORY—1 cr. (0 and 3)
Experiments designed to test or exemplify the laws studied in Phys 201 and
to introduce precision measuring instruments. Prerequisite: Registration in
Phys 201.

PHYS 204—GENERAL PHYSICS LABORATORY—1 cr. (0 and 3)
A continuation of Phys 203 using optical and electrical instruments.
Prerequisite: Registration in Phys 202.

PHYS 211—GENERAL PHYSICS FOR ENGINEERS AND SCIENTISTS—4 cr. (4 and 0)
Mechanics, sound and heat, including the laws of motion; rotation; equi-
librium; vibratory and wave motion; mechanical and thermal properties of
solids, liquids and gases; with emphasis on the solution of problems. Pre-
requisite: Math 106; registration in Phys 213.

PHYS 212—GENERAL PHYSICS FOR ENGINEERS AND SCIENTISTS—4 cr. (4 and 0)
A continuation of Phys 211 covering the laws of electric and magnetic fields;
electric currents and circuits; geometrical and physical optics; spectra; atomic
physics. Prerequisite: Phys 211; registration in Phys 214.

* On leave.
Phys 213—General Physics Laboratory—1 cr. (0 and 3)
Experiments based on the laws studied in Phys 211, the theory and use of
precise measuring apparatus, the treatment of observed data and significant
figures. Prerequisite: Registration in Phys 211.

Phys 214—General Physics Laboratory—1 cr. (0 and 3)
A continuation of Phys 213 with emphasis on the accurate measurement of
electrical quantities and the properties of light. Prerequisite: Registration in
Phys 212.

Phys 221—Thermal and Electrical Phenomena—3 cr. (3 and 0)
Thermal properties of matter; electric and magnetic fields; electric currents
and circuits; motions of charged particles in fields. Prerequisite: Phys 122,
registration in Phys 223.

Phys 222—Optics and Modern Physics—3 cr. (3 and 0)
Theory of light waves and photons; optical instruments; relativity; atomic
particles; nuclear physics. Prerequisite: Phys 221.

Phys 223—General Physics Laboratory—1 cr. (0 and 3)
A continuation of Phys 124 with emphasis on the accurate measurement of
electrical quantities and the properties of light. Prerequisite: Registration in
Phys 221.

Phys 224—General Physics Laboratory—1 cr. (0 and 3)
A continuation of Phys 223. Experiments on electrical measurements, optics
and modern physics. Prerequisite: Phys 222.

Phys 231—General Physics for Physics Majors II—3 cr. (3 and 0)
A continuation of Phys 132. An introduction to the magnetic field, electric
circuits, wave motion, reflection, refraction, diffraction of waves, electromag-

Phys 232—General Physics for Physics Majors III—3 cr. (3 and 0)
A continuation of Phys 231. An introduction to thermodynamics, relativity,
particle and wave descriptions of matter and light. Includes a description of
experiments which were crucial to recent developments in physics. Prerequisite:
Phys 231.

Phys 233—Experimental Physics for Physics Majors II—1 cr. (0 and 3)
A continuation of Phys 133. An experimental basis for Phys 231. Pre-
requisite: Phys 133 and registration in Phys 231.

Phys 281—Thermal and Electrical Phenomena—3 cr. (3 and 0)
Honors section in Phys 221. Open by invitation only.

Phys 282—Optics and Modern Physics—3 cr. (3 and 0)
Honors section in Phys 222. Open by invitation only.

Phys 304—Descriptive Astronomy—3 cr. (3 and 0)
The properties of the planets and their satellites, their actual and apparent
motions; the properties of stars and galaxies; current theories and speculations.
Prerequisite: Phys 202 or 212 or 222.

Phys 305—Photography—3 cr. (2 and 3)
Various phases of photography including photographic optics, sensitivity of
negative materials, making prints and enlargements, composition of pictures.
Prerequisite: Phys 202 or 212; permission of the instructor.
PHYS 308—SOUND AND ACOUSTICS—3 cr. (3 and 0)
Production, propagation, properties and measurement of sound waves with emphasis on the acoustics of buildings. Prerequisite: Phys, 202 or 212 or 222, registration in Math 205.

PHYS 321—MECHANICS I—3 cr. (3 and 0)
Statics; motions of particles and rigid bodies; vibratory motion; gravitation; properties of matter, flow of fluids. Prerequisite: Phys 212 or 222, registration in Math 306.

PHYS 322—MECHANICS II—3 cr. (3 and 0)
Dynamics of particles and of rigid bodies, Lagrangian and Hamiltonian formulations, vibrations of strings, wave propagation. Prerequisite: Phys 321 or permission of instructor.

PHYS 325—EXPERIMENTAL PHYSICS I—4 cr. (2 and 6)
Introduction to laboratory techniques, measurement of fundamental constants, and performance of some of the experiments (Stern-Gerlach, Zeeman, Photo-electric, specific charge of electrons and protons, etc.) which are crucial to the development of our present concepts of physics. Prerequisite: Phys 321 or equivalent or enrollment in Phys 321 or by permission of the instructor.

PHYS 326—EXPERIMENTAL PHYSICS II—4 cr. (2 and 6)
Continuation of Phys 325.

PHYS 341—ELECTRICITY AND MAGNETISM—3 cr. (3 and 0)
Electric circuits; electromagnetic induction; properties of capacitors and inductors as circuit elements; A.C. circuit problems by vector methods and by use of complex numbers; electrostatic fields. Prerequisite: Phys 212 or 222 and Registration in Math 306.

PHYS 351—INTRODUCTION TO MODERN PHYSICS—3 cr. (3 and 0)
The properties of electrons, protons and other atomic particles; elementary quantum theory and its applications to photoelectric effect, X-rays and Bohr theory of atomic structure. Prerequisite: Phys 212, registration in Math 306 or permission.

PHYS 401—SENIOR THESIS—3 cr. (1 and 6)
The senior thesis is a semi-original piece of work performed under the direction of a member of the physics staff. The project is done in any one of the various fields of physics, but is usually associated with X-ray studies, electron microscopy, electronics or spectroscopy. Prerequisite: At least three Physics courses beyond General Physics.

PHYS 404—ASTRODYNAMICS—3 cr. (3 and 0)
Astronomical coordinate systems, orbit determinations, multiple body problems, perturbations, non-gravitational and relativistic effects and observational theory. Special attention to problems of artificial satellites. Prerequisite: Phys 321.

PHYS 432—PHYSICAL OPTICS AND INTRODUCTION TO SPECTROSCOPY—3 cr. (3 and 0)
Phys 441—Electricity and Magnetism—3 cr. (3 and 0)

Electric potential; properties of dielectrics; magnetic fields due to moving charges; magnetic properties of materials; Maxwell's field equations with applications. Vector analysis is used throughout. Prerequisite: Phys 341 or equivalent.

Phys 446—Solid State Physics—3 cr. (3 and 0)

An introductory treatment of the crystal structure of solids and the properties of solids which depend on crystal structure; free electron model of metals; band theory of solids; Brillouin zones, crystalline defects and diffusion. Prerequisite: Phys 455 or permission of instructor.

Phys 452—Introductory Nuclear Physics—3 cr. (3 and 0)

Various phases of nuclear physics including natural and induced radioactivity; properties of alpha, beta and gamma-rays; cosmic rays; nuclear energy levels and decay schemes; particle accelerators, fission, fusion and nuclear reactors. Prerequisite: Phys 351.

Phys 454—Nuclear Physics Laboratory—1 cr. (0 and 3)

Techniques and instruments used in detection and measurement of nuclear radiation. Experiments include half-life determination, absorption measurements, neutron activation, coincidence measurements, decay schemes, and gamma-ray spectroscopy. Prerequisite: Registration in Phys 452.

Phys 455—Modern Physics II—3 cr. (3 and 0)

Elements of relativity theory and quantum mechanics with application to the properties of atoms, molecules and solids. Prerequisite: Phys 351 or permission of instructor.

Phys 460—Modern Physics for High School Teachers—3 cr. (3 and 0)

A study of later developments including the measurements of atomic particles. The formulation of new laws and the modifications of old ideas needed to describe the interactions of these particles.

Phys 465—Thermodynamics and Statistical Mechanics—3 cr. (3 and 0)

A study of temperature, development of the laws of thermodynamics and their application to thermodynamic systems. An introduction to low temperature physics is given. Prerequisite: Six hours of physics beyond Phys 212, Math 306 or permission.

Phys 471—Electron Microscopy—3 cr. (2 and 3)

The theory and operation of the electron microscope. Magnetic lens theory. The technique of specimen mounting and the interpretation of electron micrographs and diffraction patterns. Each student may choose specimens from his major field. Prerequisite: General Physics, Math 206 and permission of instructor.

Phys 501—Physics for High School Teachers I—3 cr. (3 and 0)

Phys 502—Physics for High School Teachers II—3 cr. (3 and 0)

Phys 504—Astronomy for High School Teachers—3 cr. (3 and 0)

Phys 505—Special Problems—3 cr. (0 and 9)

Phys 513—Thermodynamics and Statistical Mechanics—3 cr. (3 and 0)

Phys 521—Classical Mechanics I—3 cr. (3 and 0)

Phys 522—Classical Mechanics II—3 cr. (3 and 0)
Phys 541—Electrodynamics—3 cr. (3 and 0)
Phys 542—Radiation Theory—3 cr. (3 and 0)
Phys 545—Solid State I—3 cr. (3 and 0)
Phys 546—Solid State II—3 cr. (3 and 0)
Phys 551—Introduction to Quantum Mechanics—3 cr. (3 and 0)
Phys 553—Nuclear Physics I—3 cr. (3 and 0)
Phys 554—Nuclear Physics II—3 cr. (3 and 0)
Phys 555—X-ray Diffraction—3 cr. (3 and 0)
Phys 556—Crystallography—3 cr. (3 and 0)
Phys 575—Seminar in Contemporary Physics—1 or 2 or 3 cr. (1 or 2 or 3 and 0)
Phys 585—Colloquium—1 cr. (1 and 0)
Phys 591—Research—3 cr.
Phys 592—Research—3 cr.
Phys 622—Hydrodynamics—3 cr. (3 and 0)
Phys 651—Quantum Mechanics I—3 cr. (3 and 0)
Phys 652—Quantum Mechanics II—3 cr. (3 and 0)
Phys 655—Advanced Modern Physics I—3 cr. (3 and 0)
Phys 656—Advanced Modern Physics II—3 cr. (3 and 0)
Phys 666—Relativity—3 cr. (3 and 0)
Phys 691—Doctoral Research and Dissertation—Credit to be arranged

POULTRY SCIENCE

MR. BARNETT

MR. BOONE, MR. COOPER, * MR. STEPHENS, MR. TURK, MR. TAYLOR

PS 201—Introduction to Poultry Science—3 cr. (2 and 3)
The application of the physical and biological sciences to modern poultry production and utilization. A study of the anatomy and physiology of the fowl and the economic aspects of poultry enterprises.

PS 354—Poultry Breeding—3 cr. (2 and 3)
The application of genetics to the improvement of poultry and the effectiveness of different selection methods and mating systems. Prerequisite: Gen 302.

PS 355—Poultry Grading and Processing—3 cr. (2 and 3)
Classifying and grading of market eggs and poultry, and the preparation, packaging, processing, storage, and preservation of eggs and poultry.

PS 356—Incubation and Brooding—3 cr. (2 and 3)
Principles and practice of incubation and brooding with consideration of the embryology of the chick and hatchery management.

* On leave.
PS 401—Poultry Environment Technology—3 cr. (2 and 3)
The factors involved in creating an environment for the fowl conducive to a high rate of production and compatible with maximum economic returns for the commercial enterprise.

PS 451—Poultry Nutrition—3 cr. (2 and 3)
Nutrient requirements of the various classes of poultry and the use of feedstuffs in meeting these needs. Prerequisite: An Sc 301.

PS 458—Poultry Diseases and Parasites—4 cr. (3 and 3)
Causes, occurrence, symptoms, prevention, treatment, and eradication of poultry diseases and parasites. Prerequisite: Bact 301.

PS 460—Seminar—2 cr. (2 and 0)
Current research reported in journals covering the various areas of poultry science. Prerequisite: Permission of instructor.

PS 501—Poultry Nutrition and Metabolism—3 cr. (2 and 3)

PS 504—Poultry Pathology—3 cr. (1 and 6)

PS 505—Seminar—1 cr. (1 and 0)

PS 508—Research—3 cr.

PS 591—Research—3 cr.

PSYCHOLOGY

Mr. Waite, Mr. Capel, Mr. Davenport

PSYCH 301—General Psychology—3 cr. (3 and 0)
A survey of the field of psychology: development and adjustment, motivation, emotions, intelligence, personality, the sensory experiences, perception, learning, thinking, imagination and mental hygiene. Prerequisite: Junior standing.

PSYCH 302—Social Psychology—3 cr. (3 and 0)
The interaction between the individual and the forces of society: the classical theories, the psychobiological bases of human behavior, the sociocultural bases of behavior, types of human behavior, overt and covert experiences, symbolism, personality and social interaction. Prerequisite: Psych 301.

PSYCH 401—Applied Psychology—3 cr. (3 and 0)
A study of the concepts of psychology as applied to individual, business, and professional behavior. Prerequisite: Psych 301.

PSYCH 402—Abnormal Psychology—3 cr. (3 and 0)
Mental and emotional disorders: theories of causation and problems of treatment; special phenomena of consciousness and unconsciousness, e.g., dreams, dissociation, hypnosis; analysis of pathological behavior: alcoholism, drug addiction, suicide, criminality, neurosis, and psychoneurosis. Prerequisite: Psych 301.

PSYCH 403—Personality—3 cr. (3 and 0)
**RELIGION**

*Mr. Ware*

**REL 301—The Old Testament—3 cr. (3 and 0)**

A survey of the Old Testament.

**REL 302—A Survey of New Testament Literature—3 cr. (3 and 0)**

A survey of the books of the New Testament, studies as to content, literary form and purpose. Some consideration is given to the life and teachings of Jesus and the letters of Paul.

**REL 303—A Survey of World Religions—3 cr. (3 and 0)**

The problems and methods of studying living religions. The dynamics of living religions are analyzed as they are expressed in the history, beliefs, and practices of various religious communities. *Prerequisite:* Junior standing.

**RURAL SOCIOLOGY**

*Mr. Lanham*  
*Mr. Boyd*

**RS 301—Rural Sociology—3 cr. (3 and 0)**

Human social relationships as modified by life in the country including a consideration of the farm family, its housing, health, schooling, recreational opportunities, relation to land and other similar topics.

**RS 459—The Community—3 cr. (3 and 0)**

The growth and development of the rural community with emphasis on organization of the community for its effective functioning in a changing society.

**RS 461—Rural Leadership—3 cr. (3 and 0)**

Social and psychological factors involved in rural leadership including an examination and analysis of characteristics of the successful leader, and the role of the leader in the rural community.

**RS 501—Rural Social Systems—3 cr. (3 and 0)**

**RUSSIAN**

*Mr. Conis*

**Russ 101—Elementary Russian—3 cr. (3 and 1)**

Training in pronunciation, grammatical forms, and syntax with a view of giving the student the fundamentals necessary to read simple Russian texts. Three hours a week classroom instruction and one hour a week in the language laboratory.

**Russ 102—Elementary Russian—3 cr. (3 and 1)**

A continuation of Russ 101. Three hours a week classroom instruction and one hour a week in the language laboratory.

**Russ 201—Intermediate Russian—3 cr. (3 and 1)**

The reading of simple Russian prose; a review of grammar and syntax. Drill on vocabulary and idiom. Three hours a week classroom instruction and one hour a week in the language laboratory. *Prerequisite:* Russ 101 and 102.

**Russ 202—Intermediate Russian—3 cr. (3 and 0)**

A continuation of Russ 201.
SOCIOMETRY

Mr. Burtnor  Mr. Capel

Soc 301—Introductory Sociology—3 cr. (3 and 0)

The basic principles of sociology: culture, biological factors, the influence of geographical environment, human nature, group life, social classes, communities, social institutions and social change. Prerequisite: Junior standing.

Soc 302—Social Problems—3 cr. (3 and 0)

A survey of the major social problems, including problems of industry, education, religion, disease and public health, poverty, dependency and factors affecting social adjustment. Required of all students presenting Sociology as the secondary field of concentration. Prerequisite: Soc 301.

Soc 402—The Family—3 cr. (3 and 0)

An inquiry into the problems of marriage and family life: the history of the family, the sociology of family life, mate selection and courtship, husband-wife relationships, parent-child interaction, divorce, and conservation of family values. Prerequisite: Senior standing.

Soc 404—Social Anthropology—3 cr. (3 and 0)

Recent and contemporary man, as a social and culture-bearing animal with emphasis on the constants and variants in human behavior involved in technology, social relations, language, religion, art, and other aspects of cultures. Prerequisite: Soc 301.

Soc 405—Industrial Sociology—3 cr. (3 and 0)

A study of industry as a social organization together with the scientific examination of personality in industrial relations; the factory as a social system; problems of management; problems of labor; problems of special groups in industry; labor-management relations; and industry and the community. Prerequisite: 3 credits of sociology and permission of the instructor.

Soc 406—Regional Sociology—3 cr. (3 and 0)

An analysis and survey of American regions emphasizing facts, factors and policies pertaining to geography, population, culture, resources and waste, social institutions, and planning. Prerequisite: 3 credits of sociology.

Soc 407—Sociological Theory—3 cr. (3 and 0)

A survey of the growth of sociological theory considered from the viewpoint of the development of representative schools, their interrelationships, and convergences in mid-twentieth century theory. Required of all students presenting sociology as a secondary field of concentration. Prerequisite: 6 semester hours in sociology.

Soc 408—Social Structure—3 cr. (3 and 0)

Analysis of social structure and stratification in terms of class, status, prestige, rank, and function. Attention is given to the social role of the elite, bureaucracies, and professional and middle classes. Prerequisite: 6 semester hours in sociology.

Soc 409—Selected Topics in Sociology—3 cr. (3 and 0)

Urban Sociology, Sociology of Medicine, or the Sociology of Complex Organizations, depending on the interests of the students registering. Prerequisite:
Six semester hours in Sociology. Open only to students presenting Sociology as the secondary field of concentration.

SPANISH

Mr. Conis, Mr. Herlinger, Mr. Fernandez, Mr. Mixon, Mrs. Fernandez

SPAN 101—Elementary Spanish—3 cr. (3 and 1)
A course for beginners in which the essentials of grammar are taught and a foundation is provided for a conversational and reading knowledge of the language. Three hours a week of classroom instruction and one hour a week in the language laboratory.

SPAN 102—Elementary Spanish—3 cr. (3 and 1)
A continuation of Span 101, with a reader.

SPAN 201—Intermediate Spanish—3 cr. (3 and 1)
A review of grammar, vocabulary, and idioms; conversation, composition, and translation. Three hours a week classroom instruction and one hour a week in the language laboratory. Prerequisite: Span 102.

SPAN 202—Intermediate Spanish—3 cr. (3 and 0)
Introduction to Spanish literature: representative short stories, essays, novels, poetry, and plays. Prerequisite: Span 201. Assignments in the language laboratory.

SPAN 303—Survey of Spanish Literature I—3 cr. (3 and 0)
Literary movements, influences, and authors from the beginnings to the end of the seventeenth century. Representative works, discussions. Required of Spanish majors. Prerequisite: Span 201 and 202.

SPAN 304—Survey of Spanish Literature II—3 cr. (3 and 0)
Literary movements, influences, and authors from the eighteenth century to the present. Required of Spanish majors. Prerequisite: Span 303.

SPAN 305—Conversational Spanish—3 cr. (3 and 0)
Practice in spoken Spanish with emphasis on vocabulary, pronunciation, intonation, and comprehension. Some written work to increase accuracy. Required of Spanish majors. Assignments in the language laboratory. Prerequisite: Span 201 and 202.

SPAN 306—Advanced Conversation and Composition—3 cr. (3 and 0)
A continuation of Span 305 with more emphasis on written Spanish. Required of Spanish majors. Prerequisite: Span 305.

SPAN 401—Contemporary Spanish Literature—3 cr. (3 and 0)
Literary trends and representative authors since 1898. Prerequisite: Span 303 and 304.

SPAN 402—Contemporary Spanish Drama—3 cr. (3 and 0)
The Spanish theater from Benavente to the present. Prerequisite: Span 303 and 304.

SPAN 405—Nineteenth Century Spanish Literature—3 cr. (3 and 0)
Representative authors and movements of the nineteenth century; romanticism, costumbrismo, and the regional novel. Prerequisite: Span 303 and 304.
Description of Courses

SPAN 406—CERVANTES AND THE GOLDEN AGE—3 cr. (3 and 0)
A study of Cervantes and the theater of the Golden Age of Spanish literature. Prerequisite: Span 303 and 304.

TEXTILE CHEMISTRY

MR. PORTER, MR. ROBBINS, MR. GOLDEMBERG, MR. OLSON

TC 203—TEXTILE CHEMISTRY—3 cr. (3 and 0)
Aliphatic organic compounds with major emphasis on products essential to the textile industry for Textile and Textile Chemistry majors. Prerequisite: Ch 102.

TC 204—TEXTILE CHEMISTRY—3 cr. (3 and 0)
Continuation of TC 203 covering the aromatic compounds with particular attention to the chemistry of dyes, finishes, and polymers.

TC 205—TEXTILE CHEMISTRY LABORATORY—1 cr. (0 and 3)
For textile majors not majoring in Textile Chemistry. To be taken concurrently with TC 203.

TC 206—TEXTILE CHEMISTRY LABORATORY—1 cr. (0 and 3)
Continuation of TC 205. To be taken concurrently with TC 204.

TC 207—TEXTILE CHEMISTRY LABORATORY—2 cr. (0 and 6)
For Textile Chemistry majors. To be taken concurrently with TC 203.

TC 208—TEXTILE CHEMISTRY LABORATORY—2 cr. (0 and 6)
Continuation of TC 207. To be taken concurrently with TC 204.

TC 315—THE CHEMISTRY OF FIBERS—3 cr. (3 and 0)
The physical and chemical properties of large molecular substances such as synthetic and natural fibers. The kinetics of addition and condensation polymerization, and the common physical methods of measurement that are used in polymer science. The design of polymer systems for an end use in the textile industry with emphasis on fabric and dyeing properties. Prerequisite: TC 204.

TC 316—CHEMISTRY OF SCOURING, BLEACHING, AND SURFACE ACTIVE AGENTS—3 cr. (2 and 3)
The chemicals used in the preparation of fabric for dyeing and finishing. Oxidizing and reducing agents and their control and effect on various fibers. Colloidal and surface active properties of various compounds and the fundamental factors influencing these properties. Prerequisite: TC 315.

TC 317—SYNTHETIC FIBER LABORATORY—1 cr. (0 and 3)
The preparation of synthetic fibers from monomeric compounds. The spinning of regenerated and synthetic fibers in a dyed and undyed form. Some of the reactions of large molecules will be covered. This course is to be taken concurrently with TC 315.

TC 448—DYEING AND FINISHING II—3 cr. (3 and 0)
Continuation of TC 457 to complete the coverage of material pertaining to dyeing. This course will also go into the use of instrumentation in the textile finishing industry. Prerequisite: TC 457.
TC 450—**Dyeing and Finishing Laboratory**—1 cr. (0 and 3)
To be scheduled concurrently with TC 448. The course will cover finishing in addition to dyeing operations and their instrumental control.

TC 457—**Dyeing and Finishing I**—3 cr. (3 and 0)
The kinetics and equilibria of dyeing processes will be covered. The use of conductivity, diffusion, and other methods useful for measuring adsorption isotherms and dyeing rates and the general thermodynamic relationships applicable to dyeing operations. Fiber properties such as zeta potential, dye sites, relative amorphous area available will be included. **Prerequisite:** TC 315.

TC 459—**Dyeing and Finishing Laboratory**—1 cr. (0 and 3)
To be scheduled concurrently with TC 457. The course will introduce the student to common dyeing and printing methods and to some of the machinery necessary to carry out dyeing operations.

TC 461—**Seminar and Research**—2 cr. (0 and 6)
An investigation by each textile chemistry senior of an assigned problem related to textile processing. A formal written report is required. **Prerequisite:** Senior standing.

TC 466—**Textile Unit Operations**—3 cr. (3 and 0)
Designed to cover some of the principles behind textile equipment operation such as heat transfer in drying and dyeing processes and fluid flow in pressure and open dye operations and polymer production.

TC 475—**Cellulose Chemistry**—2 cr. (2 and 0)
The constitution proof of structure and reaction of cotton and other cellulosic materials with oxidizing agents, alkali, etc. The implications of accessibility-crystallinity relationships in cellulosic materials. The effect of mercerization and degree of substitution on physical properties of cellulose. The preparation of different rayons and acetate fibers. **Prerequisite:** TC 315 or permission of instructor.

TC 511—**The Theory and Application of Synthetic Resinous Materials**—3 cr. (2 and 3)

TC 512—**The Theory and Application of Synthetic Resinous Materials**—3 cr. (2 and 3)

TC 521—**Advanced Cellulose Chemistry**—3 cr. (3 and 0)

TC 531—**Chemistry of Coloring Matters**—3 cr. (3 and 0)

TC 591—**Research**—3 cr.

TC 592—**Research**—3 cr.

**Textiles**

**Mr. Campbell**

**Mr. McKenna, Mr. Cartee, Mr. Hubbard, Mr. Marvin, Mr. Tarrant, Mr. Thomson, Mr. Walters, Mr. Williams, Mr. Gentry**

**Text 122—Introduction to Textiles**—3 cr. (2 and 3)
An introduction to textile manufacturing. Studies of staple fibers, and machinery involved in converting them into yarns and fabrics.
Text 201—Fiber Processing I—3 cr. (2 and 3)
Acquaints students with various fibers, terminology, fundamental properties and initial processing.

Text 202—Fiber Processing II—3 cr. (2 and 3)
The mechanical operations and related equipment used in the processing of fibers to a usable structure, usually yarns.

Text 303—Fiber Processing III—3 cr. (2 and 3)
The various fiber assemblies and yarn structures encountered in the manufacture of yarns.

Text 304—Fiber Processing IV—3 cr. (2 and 3)
The interactions of the mechanical operations used in fiber processing and the geometry and properties of fibers and yarn structures. Primarily, cause and effect relations will be investigated showing the effects of fiber properties on process dynamics and properties of the fiber assemblies produced.

Text 305—Yarn Structure I—3 cr. (2 and 3)
Basic study of materials used for manufacturing yarns. Machine mechanisms, theory and operations for the opening, picking, carding, and combing of fibers. Draft, production, and waste at these machines are dealt with mathematically. Other factors concerned with this portion of a textile plant covered generally, including organization and layout. Prerequisite: Junior standing. Non-textile majors.

Text 306—Yarn Structure II—3 cr. (2 and 3)
Machine mechanisms, theory, and operations for the drawing, roving, spinning, and twister frames. Emphasis on the mathematical study of the drafting, twisting, and winding components for these processes. Brief survey of the silk, and worsted system for yarn production. Prerequisite: Text 305. Non-textile majors.

Text 311—Fabric Development I—3 cr. (2 and 3)
The theory of mechanisms as applied to weaving machines together with the application of the theory of elementary textile designs used in the construction of woven fabrics.

Text 312—Fabric Development II—3 cr. (2 and 3)
The more complex loom mechanisms and special and compound weaves. Prerequisite: Text 311.

Text 313—Fabric Structure I—3 cr. (2 and 3)
Theory and practice involved in the application of design to textile uses. Principles involved in converting yarns to fabrics, including loom mechanics. Prerequisite: Junior standing. Non-textile majors.

Text 314—Fabric Structure II—3 cr. (2 and 3)
Continuation of Text 313.

Text 321—Fiber Science—3 cr. (2 and 3)
Fiber properties and the proper scientific evaluation of these properties.

Text 322—Properties of Textile Structures—3 cr. (2 and 3)
The analysis and significance of yarn and fabric properties and a study of methods of determining these properties.
Text 324—Textile Statistics—3 cr. (3 and 0)
An introduction to statistics with particular application to the Textile Industry. Measures of central value and variation, probability, the normal curve, tests of hypotheses, elementary correlation and regression. Prerequisite: Junior standing.

Text 329—General Textiles—3 cr. (2 and 3)
A survey of the textile industry for students not majoring in or taking a secondary concentration in Textiles. Prerequisite: Junior standing.

Text 411—Fabric Development III—4 cr. (3 and 3)
The principles concerning the specifications required for the production of fabrics to include layouts, designs, construction, warping, and slashing. Prerequisite: Text 312.

Text 412—Fabric Development IV—4 cr. (3 and 3)
Production and analysis of woven patterns as studied in fundamental courses in the weaving and designing areas. Fabric development, analysis and cloth order problems. Prerequisite: Text 411.

Text 413—Fabric Development V—3 cr. (2 and 3)
A continuation of Text 412 covering more complex weaves for double cloths, pile fabrics, and jacquard effects. Prerequisite: Concurrent with Text 412.

Text 414—Knitting—3 cr. (2 and 3)
A survey of knitting dealing with the principles and mechanisms involved. Various systems will be covered with emphasis on yarn requirements and fabric properties. Types of stitch structures and the mechanisms necessary for their production will be demonstrated in the laboratory.

Text 421—Textile Costing I—3 cr. (2 and 3)
Actual and standard cost principles as they apply to the manufacture of textiles. Allocating the cost of material, labor and overhead; determining the cost of individual yarns and fabrics; valuing the inventory; making of cost reports, payroll analysis and the use of data processing. Prerequisite: Senior standing or permission of instructor.

Text 422—Textile Costing II—3 cr. (2 and 3)
Continuation of Text 421.

Text 423—Textile Seminar and Research—1 cr. (1 and 0)
Visiting lecturers will discuss topics of general interest in the industry. Each student will plan and develop a research project related to the field of textiles. Prerequisite: Senior standing in textiles.

Text 426—Instrumentation—3 cr. (3 and 0)
The approach to instrumentation will be directed at developing an understanding of the principles of controlling regulatory variables encountered in textile plants. The course will deal with types of control devices available in the configurations usually applied to textile processes with a minimum emphasis on design of systems as such. The control of temperature, humidity, pressure, flow, energies and time will be covered with contrasts drawn between mechanical, pneumatic, electrical and electronic methods.
ZOOLOGY

Mr. Cochran

Mr. Reed, Mr. Adkins, Mr. Anderson, Mr. Fox, Mr. King, Mr. Ware, Mr. Webb, Mr. Buxton, Mr. Tombes, Mrs. Crosby

Zool 101, 103—General Zoology—4 cr. (3 and 3)

Thorough training in fundamental animal types and zoological principles. The morphology, physiology, behavior, reproduction, ecology, embryology, zoogeography, evolution and palaeontology of each phylum are presented.

Zool 301—Comparative Vertebrate Anatomy—3 cr. (2 and 3)

Advanced training in zoological principles, physiology and comparative vertebrate anatomy. Prerequisite: Zool 101, 103.

Zool 302—Vertebrate Embryology—3 cr. (2 and 3)

Fundamentals of developmental anatomy of the organ systems as illustrated by the chick and pig. Students prepare histological sections and mounts to acquire practice in laboratory procedures and knowledge of vertebrate microscopic anatomy. Identification of the various tissues is stressed. Prerequisite: Zool 101, 103 and 301 or permission of the instructor.

Zool 304—Animal Ecology—3 cr. (2 and 3)

Marine, fresh water and land animal communities as they exist in South Carolina. Students will gain a knowledge of the common animal associations as they are related to land use through lectures, reading, films and field trips.

Zool 306—Game Management—2 cr. (2 and 0)

Breeding habits of game animals and birds and type of territory desirable. The ethics of sportsmanship and the control of predators are among other subjects covered.

Zool 307—Animal Anatomy and Physiology—3 cr. (2 and 3)

Anatomy, and physiological processes of ingestion, secretion, excretion, respiration, circulation, reproduction and metabolism of warm-blooded animals. This course is designed for students majoring in Pre-Medicine, Pre-Veterinary, Animal Science, Dairy Science, and Poultry Science. Prerequisite: Zool 101, 103.

Zool 308—Applied Zoology—2 cr. (2 and 0)

The fundamental principles of zoology are presented along with a brief description of the important phyla of animals. The management and control of animals of economic importance excluding domestic animals and the nature of animal diseases is included. This is a terminal course designed for engineering students who do not plan further work in the field. Prerequisite: Bot 101.

Zool 312—Wildlife Management—3 cr. (2 and 3)

Basic principles and general practices of Wildlife Management and Conservation will be covered. This course deals with the major problems concerning the management of Wildlife Resources, with emphasis on upland game species. The laboratory work includes practical work on the Clemson University Woodlands and field trips to several areas where wildlife management is being practiced.
Zoology 275

Zool 403—Protozoology—3 cr. (2 and 3)
Taxonomy of the sub-kingdom protozoa with special reference to the parasitic forms directly affecting man. Representative types of free-living forms are surveyed with emphasis on their morphology, physiology and distribution. Prerequisite: Zool 101, 103.

Zool 404—Animal Pathology—3 cr. (2 and 3)
Designed to inform students in the causes, treatments, and prevention of animal diseases. Those transmissible to man are considered in detail. Emphasis is placed on hygiene and care of the sick.

Zool 405—Animal Histology—3 cr. (2 and 3)
Microscopic structures of tissues and organs of the animal body. This course is for students in Pre-Veterinary, Pre-Medicine and the Animal Science courses. Prerequisite: Zool 101, 103.

Zool 456—Parasitology—3 cr. (2 and 3)
Parasites affecting man and domestic animals. Life cycles, vectors and practical controls are emphasized.

Zool 458—Cell Physiology—3 cr. (2 and 3)
An introduction to the fundamental processes of physiology as exemplified by the cell. Dynamic cellular environment, irritability and response, metabolism, respiration and growth and differentiation will be studied. Prerequisite: Zool 101, 103, Organic Chemistry.

Zool 501—Animal Histology—3 cr. (2 and 3)
Zool 502—Histological Techniques—3 cr. (1 and 6)
Zool 503—Animal Ecology—4 cr. (2 and 6)
Zool 504—Ornithology—3 cr. (2 and 3)
Zool 505—Animal Pathology—3 cr. (3 and 0)
Zool 511—Recent Advances in Zoology and Entomology I—1 cr. (1 and 0)
Zool 512—Recent Advances in Zoology and Entomology II—1 cr. (1 and 0)
Zool 513—Evolution—3 cr. (3 and 0)
Zool 552—Principles and Methods of Systematic Zoology—2 cr. (2 and 0)
Zool 556—Economic Zoology—3 cr. (2 and 3)
Zool 563—Special Problems—1 to 4 cr.
Zool 591—Research—3 cr.
Zool 592—Research—3 cr.
PUBLIC SERVICE ACTIVITIES

Part VI
COLLEGE OF AGRICULTURE AND BIOLOGICAL SCIENCES STAFF

PUBLIC SERVICE ACTIVITIES

Agricultural Regulatory Committee of Board of Trustees

L. D. HOLMES, Chairman .................................................. Johnston
ROBERT R. COKER ............................................................. Hartsville
WINCHESTER SMITH ......................................................... Williston
T. KENNETH CRIBB ........................................................... Spartanburg
E. OSWALD LIGHTSEY ........................................................ Hampton

Administration

R. C. EDWARDS, B.S., LL.D. ................................................. Vice-President for Academic Affairs and Dean of the University
J. K. WILLIAMS, PH.D. ....................................................... Dean of the College of Agriculture and Biological Sciences
W. H. WILEY, PH.D. .......................................................... Director, Livestock-Poultry Health Dept., Columbia
C. E. BOYD, D.V.M .................. Director, Fertilizer Inspection and Analysis
B. D. CLOANINGER, M.S. .................................................... Director of Agricultural Experiment Station,
O. B. GARRISON, PH.D. ..................................................... Director of Research in Agriculture
J. W. JONES, PH.D. ............................................................ Director of Resident Instruction
G. B. NUTT, M.S. .................................................................. Director of Extension
T. W. MORGAN, M.S. .......................................................... Associate Director of Extension
SALLIE P. MUSHER, M.A. ....................................................... State Home Demonstration Agent
G. H. BONNETTE, B.S. ......................................................... Administrative Assistant, Extension Service
C. E. WOODALL, M.S. .......................................................... Administrative Assistant, Experiment Station
SARA A. WAYMER, M.S. ......................................................... Assistant in Home Economics Extension,
E. N. WILLIAMS, B.S. .......................................................... Assistant in Agricultural Extension,

Extension Supervisors

L. B. MASSEY, B.S. ............................................................ District Agent, Piedmont District, Clemson
J. M. LEWIS, B.S. ............................................................. District Agent, Pee Dee District, Florence
D. A. SHELLEY, B.S. .......................................................... District Agent, Savannah Valley District, Barnwell
CURTYS BALLENTINE, M.S. ................................................. Associate District Agent, Piedmont District, Clemson
RUBY CRAVEN, PH.D. ....................................................... Associate District Agent, Savannah Valley District, Clemson
SARAH S. KNOX, B.S. .......................................................... Associate District Agent, Pee Dee District, Clemson

Superintendents Branch Experiment Stations

W. C. BARNES, PH.D.—
Truck Station, P. O. Box 3158, St. Andrews Branch, Charleston
D. F. COHOON, PH.D. ......................................................... P. O. Box C, Edisto Station, Blackville
C. H. MUDGE, B.S.—
Sheep Station, Wellman Division, P. O. Box 246, Johnsonville
H. H. PIERCE, PH.D. ........................................................ P. O. Box 329, Coast Station, Summerville
J. B. PITNER, PH.D. ........................................................ P. O. Box 271, Pee Dee Station, Florence
W. H. RHODES, B.S. ........................................................ Sandhill Station, P. O. Box 1771, Columbia

Agricultural Communications

J. B. COPELAND, M.S.†§ .................................. Head of Department, Editor, Professor
R. C. HUBBARD, JR., M.S.†§ .................................. Acting Editor and Head of Department,
B. E. DAVIS, M.S.† ........................................................ Associate Communications Editor
W. B. EARE, JR.† .......................................................... Extension Artist

† Research staff.
§ Extension staff.
† On leave.
L. C. Hamilton, M.S.† Extension Information Specialist
J. R. Mattison, B.S.† Assistant Radio Editor
L. W. Riley ‡ Visual Instruction Editor
H. M. Smith ‡‡ Assistant Photographer
L. C. Smith, B.A.‡ Extension Television Editor
Doris A. Timmerman, M.S.‡‡ Assistant Home Economics Editor

### Agricultural Economics and Rural Sociology

W. J. Lanham, Ph.D.♦† Head of Department, Professor
L. M. Bauknight, M.S.♦ Associate Professor
D. W. Bickley, M.S.† Assistant Agricultural Economist
V. A. Boyd, M.S.A.♦† Associate Professor
T. A. Burch, M.S.† Assistant Agricultural Economist
C. P. Butler, M.S.† Agricultural Economist (USDA)
E. M. Corley, Ph.D.♦† Assistant Professor
D. E. Crawford, M.S.† Associate Agricultural Economist
H. C. Gilliam, M.S.† Agricultural Economist (USDA)
J. W. Hubbard, Ph.D.♦† Assistant Professor
H. W. Kerr, M.S.† Agricultural Economist (USDA)
O. W. Lloyd, M.S.† Community and Rural Development Specialist
J. V. McElveen, M.S.† Agricultural Economist (USDA)
L. D. Malphrus, Ph.D.† Associate Professor
J. F. Miles, Ph.D.† Associate Professor
J. F. Pittman, M.S.♦§ Assistant Professor
A. D. Roark, M.A.† Agricultural Statistician, Columbia (USDA)
M. C. Rochester, Ph.D.† Leader, Extension Agricultural Economics Work
H. C. Spurlin, Ph.D.♦† Associate Professor
J. M. Stepp, Ph.D.♦ Professor
M. H. Sutherland, M.S.† Farm and Home Development Specialist
L. E. Talbert, Ph.D.♦† Assistant Professor
J. S. Taylor, B.S.† Agricultural Statistician, Columbia (USDA)
B. J. Todd, M.S.♦§ Associate Professor
G. R. von Tungeln, M.S.♦† Associate Professor
C. H. Whitworth, B.S.A.† Agricultural Statistician, Columbia (USDA)
P. S. Williamson, M.S.† Extension Farm Management Specialist
N. A. Wynn, M.S.† Assistant Agricultural Economist

### Agricultural Education

L. H. Davis, Ph.D.♦ Head of Department, Professor
W. C. Bowen, M.S.♦ Associate Professor
A. K. Jensen, Ph.D.♦ Assistant Professor
F. E. Kirkley, M.S.♦ Associate Professor
J. H. Rodgers, Ph.D.♦ Assistant Professor

### Agricultural Engineering

A. W. Snell, Ph.D.♦† Head of Department, Professor
W. A. Balk, B.S.† Associate Agricultural Engineer, Edisto Station
J. B. Cocke, B.S.† Agricultural Engineer (USDA)
J. T. Craig, M.S.♦ Associate Professor
L. O. Drew, Ph.D.♦† Associate Professor
C. H. Dunkelberg, M.S.† Agricultural Engineer
T. H. Garner, Ph.D.♦† Assistant Professor
W. E. Garner, M.S.† Agricultural Engineer (USDA)
W. P. Gladden, B.S.† Assistant Extension Agricultural Engineer
F. H. Hedden, M.S.† Extension Agricultural Engineer
C. E. Hood, Ph.D.† Assistant Professor
I. R. Lambert, Ph.D.♦† Assistant Professor
H. P. Lynn, B.S.† Extension Agricultural Engineer
M. C. McKenzie, B.S.† Leader, Extension Agricultural Engineering Work

*Teaching staff.
† Research staff.
‡ Extension staff.
§ On leave.
### 280 Public Service Activities

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. B. Rogers, Jr., M.S.*†</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>W. E. Seigler, B.S.†</td>
<td>Assistant Agricultural Engineer, Edisto Station</td>
</tr>
<tr>
<td>H. O. Vaigneur, M.S.*§</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>B. K. Webb, M.S.‡§</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>J. M. Williams, M.S.†</td>
<td>Agricultural Engineer (USDA)</td>
</tr>
<tr>
<td>R. E. Williamson, M.S.†</td>
<td>Instructor</td>
</tr>
<tr>
<td>T. V. Wilson, M.S.*†</td>
<td>Professor</td>
</tr>
</tbody>
</table>

**Agronomy and Soils**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>U. S. Jones, Ph.D.‡</td>
<td>Head of Department, Professor</td>
</tr>
<tr>
<td>L. R. Allen, Ph.D.†</td>
<td>Associate Extension Agronomist—Conservation</td>
</tr>
<tr>
<td>L. P. Anderson, M.S.†</td>
<td>Leader, Extension Agronomy</td>
</tr>
<tr>
<td>M. B. Banton, B.S.‡</td>
<td>Assistant</td>
</tr>
<tr>
<td>C. E. Bardsley, Jr., Ph.D.‡</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>O. W. Beale, M.S.†</td>
<td>Soil Scientist, Pee Dee Station (USDA)</td>
</tr>
<tr>
<td>D. A. Benton, B.S.†</td>
<td>Extension Agronomist—Tobacco—Florence</td>
</tr>
<tr>
<td>M. B. Boling, Ph.D.‡</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Alonzo Bright †</td>
<td>Assistant</td>
</tr>
<tr>
<td>J. F. Chaplin, Ph.D.†</td>
<td>Agronomist, Pee Dee Station (USDA)</td>
</tr>
<tr>
<td>C. R. Craddock, Ph.D.‡</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>R. E. Currin, M.S.‡§</td>
<td>Assistant, Pee Dee Station</td>
</tr>
<tr>
<td>E. B. Eskew, M.S.‡</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>Z. T. Ford, B.S.†</td>
<td>Associate Agronomist, Pee Dee Station (USDA)</td>
</tr>
<tr>
<td>A. D. Fore, B.S.†</td>
<td>Assistant, Pee Dee Station</td>
</tr>
<tr>
<td>P. B. Gibson, Ph.D.†</td>
<td>Geneticist (USDA), Lecturer in Agronomy</td>
</tr>
<tr>
<td>B. J. Gossett, Ph.D.‡</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>D. C. Harrell, B.S.†</td>
<td>Associate Agronomist, Pee Dee Station (USDA)</td>
</tr>
<tr>
<td>F. M. Harrell †</td>
<td>Supervisor, Pee Dee Station</td>
</tr>
<tr>
<td>C. M. Jones, Ph.D.‡</td>
<td>Professor</td>
</tr>
<tr>
<td>M. W. Jutras, Ph.D.‡</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>V. J. McAllister †</td>
<td>Agricultural Aide (USDA)</td>
</tr>
<tr>
<td>E. F. McClain, M.S.†</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>Alfred Manwiller, Ph.D.†</td>
<td>Associate Professor, Pee Dee Station</td>
</tr>
<tr>
<td>H. L. Musen, Ph.D.†</td>
<td>Associate Professor, Edisto Station</td>
</tr>
<tr>
<td>N. R. Page, Ph.D.‡</td>
<td>Professor</td>
</tr>
<tr>
<td>T. C. Peele, Ph.D.‡</td>
<td>Professor</td>
</tr>
<tr>
<td>J. B. Pitner, Ph.D.†</td>
<td>Superintendent and Professor, Pee Dee Station</td>
</tr>
<tr>
<td>W. H. Rhodes, B.S.†</td>
<td>Superintendent, Sandhill Station</td>
</tr>
<tr>
<td>H. V. Rogers, M.S.†</td>
<td>Extension Agronomist—Soil Fertility</td>
</tr>
<tr>
<td>R. D. Suber, Jr., B.S.†</td>
<td>Assistant, Sandhill Station</td>
</tr>
<tr>
<td>R. F. Suman, M.S.†</td>
<td>Associate Professor, Edisto Station</td>
</tr>
<tr>
<td>John Swaney †</td>
<td>Supervisor</td>
</tr>
<tr>
<td>S. A. Williams, B.S.‡</td>
<td>Extension Agronomist—Cotton</td>
</tr>
</tbody>
</table>

**Animal Science**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>R. F. Wheeler, Ph.D.‡</td>
<td>Head of Department, Professor</td>
</tr>
<tr>
<td>C. W. Ackerman, M.S.†</td>
<td>Extension Animal Science Specialist—Swine</td>
</tr>
<tr>
<td>L. F. Cato, M.S.†</td>
<td>Acting Leader, Extension Animal Science Work</td>
</tr>
<tr>
<td>R. E. Dudley, B.S.†</td>
<td>Assistant</td>
</tr>
<tr>
<td>R. L. Edwards, Ph.D.‡</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>W. C. Godley, Ph.D.‡</td>
<td>Professor</td>
</tr>
<tr>
<td>D. L. Handlin, M.S.†</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>J. R. Hill, Jr., M.S.†</td>
<td>Assistant Professor, Edisto Station</td>
</tr>
<tr>
<td>H. M. Jamison, M.S.‡§</td>
<td>Extension Animal Science Specialist—Beef Cattle</td>
</tr>
<tr>
<td>S. W. Kennedy †</td>
<td>Assistant</td>
</tr>
<tr>
<td>S. L. Moore, D.V.M.‡‡</td>
<td>Assistant State Veterinarian</td>
</tr>
<tr>
<td>C. H. Mudge, B.S.†</td>
<td>Superintendent—Sheep Station</td>
</tr>
<tr>
<td>H. H. Pierce, Ph.D.‡</td>
<td>Assistant Professor and Superintendent, Coast Station</td>
</tr>
</tbody>
</table>

* Teaching staff.
† Extension staff.
‡* Part time.
§ On leave.
R. M. Rauton, B.S.† .................................................. Assistant
R. R. Ritchie, M.S. ‡ ................................................. Professor
G. C. Skelley, Jr., Ph.D. ‡ ........................................ Assistant Professor
J. F. Wise, M.S. † .................................................... Extension Animal Science Specialist—Marketing
S. G. Woods, B.S.‡ .................................................... Assistant Animal Scientist, Edisto Station

Botany, Bacteriology, and Plant Pathology

W. M. Epps, Ph.D. ‡ ................................................................ Head of Department, Professor
W. B. Albert, Ph.D. † .................................................. Associate Professor
P. M. Alexander, Ph.D. ‡ ........................................... Assistant Professor
R. P. Ashworth, Ph.D. ‡ ............................................ Associate Professor
E. G. Beinhart, Jr., Ph.D.† .......................................... Plant Physiologist (USDA)
J. H. Bond, M.S. ‡ ...................................................... Assistant Professor
D. F. Cohoon, Ph.D. † ................................................. Superintendent and Associate Professor, Edisto Station
W. M. Dowler, Ph.D. † ................................................ Plant Pathologist (USDA)
H. H. Foster, Ph.D. † .................................................. Associate Professor
T. W. Graham, Ph.D. † ................................................ Plant Pathologist, Pee Dee Station (USDA)
J. E. Halpin, Ph.D. ‡ .................................................. Associate Professor
G. C. Kingsland, Ph.D. ‡ .......................................... Assistant Professor
A. C. Mathews, Ph.D. ‡ .............................................. Professor
W. C. Nettles, M.S. † ................................................... Leader, Extension Entomology and Plant Disease Work
D. H. Petersen, Ph.D.† ................................................. Plant Pathologist (USDA)
J. M. Rush, Ph.D. ‡ ..................................................... Professor
R. W. Rutledge, Ph.D. ‡ .............................................. Professor
W. R. Sitterly, Ph.D.† .................................................. Associate Professor, Truck Station
F. H. Smith, M.S. † ...................................................... Extension Plant Pathologist
J. B. Whitney, Jr., Ph.D. ‡ ......................................... Professor
Wesley Witcher, Ph.D. ‡ ............................................ Associate Professor

Crop Pest Commission

J. H. Cochran, Ph.D. ‡ .................................................. State Entomologist
W. M. Epps, Ph.D. ‡ .................................................. State Plant Pathologist
L. H. Senn, M.S. † ...................................................... Assistant State Entomologist
R. C. Fox, Ph.D. ‡ ...................................................... Associate Professor
B. M. Heniford, B.S.† ................................................ Assistant Entomologist
J. B. Kissam, M.S. † .................................................... Assistant Entomologist
W. R. McCaskill, M.S. † ............................................ Assistant Entomologist
L. R. Morgan, B.S.† ................................................... Entomology Assistant
L. E. Priester, Jr., M.S.† ............................................. Assistant Entomologist
W. H. Purser, M.S.† ................................................... Instructor in Entomology
D. C. Weeks, M.S.† .................................................... Assistant Entomologist
Wesley Witcher, Ph.D. ‡ ............................................ Associate Professor

Dairy Science

W. A. King, Ph.D. ‡ ..................................................... Head of Department, Professor
G. W. Brandt, Ph.D. ‡ .............................................. Associate Professor
C. C. Brannon, B.S. ‡ .............................................. Associate Professor
W. V. Chalupa, Ph.D. ‡ .............................................. Assistant Professor
C. D. Clawson, M.S.† ............................................... Assistant Extension Dairy Science Specialist
W. C. Cook, B.S.† ...................................................... Herdsman
R. W. Henningson, Ph.D. ‡ .................................... Associate Professor
Victor Hurst, Ph.D. ‡ ................................................ Alumni Professor
J. J. Janzen, Ph.D. ‡ .................................................. Associate Professor
J. W. Kelly, M.S.† ...................................................... Assistant Professor
J. T. Lazar, Jr., Ph.D. ‡ ............................................. Associate Professor
C. H. Lomas, M.A.† ................................................... Extension Dairy Science Specialist
S. L. Moore, D.V.M.† ............................................... Assistant State Veterinarian
G. D. O’Dell, M.S.† ................................................... Assistant Professor

* Teaching staff.
† Research staff.
‡ Extension staff.
§ Part time.
¶ On leave.
W. T. O’Dell, Ph.D.‡  Leader, Extension Dairy Science Work
C. B. Reeves, M.S.§ Extension Dairy Science Technologist

Entomology and Zoology

J. H. Cochran, Ph.D.°†  Head of Department, Professor
T. R. Adkins, Jr., Ph.D.°†  Associate Professor
H. R. Agee, M.S.†  Entomologist, Pee Dee Station (USDA)
Norman Allen, M.S.†  Entomologist, Pee Dee Station (USDA)
G. W. Anderson, D.V.M., M.S.°  Associate Professor of Zoology and Veterinary Medicine
J. A. Buxton, Ph.D.°†  Assistant Professor
C. S. Creighton, B.S.† Assistant Entomologist, Truck Station (USDA)
F. P. Cuthbert, Jr., B.S.†  Assistant Entomologist, Truck Station (USDA)
Augustine Day, B.S.†  Assistant Entomologist, Truck Station (USDA)
M. D. Farrar, Ph.D.°†  Senior Scientist, Professor
R. C. Fox, Ph.D.°†  Associate Professor
S. B. Hays, Ph.D.†  Assistant Professor, Pee Dee Station
A. R. Hopkins, M.S.†  Assistant Entomologist, Pee Dee Station (USDA)
W. S. Kinard, B.S.†  Assistant Entomologist, Pee Dee Station (USDA)
E. W. King, Ph.D.°†  Associate Professor
V. M. Kirk, Ph.D.†  Professor, Pee Dee Station
Frances McAlister, B.A.†  Entomology Assistant
E. R. Mitchell, Ph.D.†  Entomologist, Pee Dee Station (USDA)
R. F. Moore, Jr., Ph.D.†  Entomologist, Pee Dee Station (USDA)
W. C. Nettles, M.S.†  Leader, Extension Entomology and Plant Disease Work
J. K. Reed, Ph.D.°†  Professor
W. J. Reid, Jr., B.S.†  Entomologist, Truck Station (USDA)
L. M. Sparks, Jr., M.S.† Extension Entomologist
H. M. Taft, Ph.D.†  Entomologist, Pee Dee Station (USDA)
A. S. Tombes, Ph.D.°†  Assistant Professor
S. G. Turnipseed, Ph.D.†  Assistant Professor, Edisto Station
R. E. Ware, B.S.°  Associate Professor
L. G. Webb, Ph.D.°†  Associate Professor, Leader, Clemson Wildlife Research Project

Farms

John S. Evans, B.S.†  Head of Department

Fertilizer Inspection and Analysis, Agricultural Chemistry, Research Division

B. D. Cloaninger, M.S.†  Director
Mary C. Acock, B.S.†  Assistant
Dorothy Brock †  Fertilizer Assistant Chemist
Kathryn B. Cunningham, B.S.†  Assistant
D. W. Eaddy, M.S.†  Research Assistant
H. E. Hammer, Ph.D.†  Fertilizer Assistant Chemist
B. L. Hawkins †  Fertilizer Laboratory Assistant
Edna C. Kay, B.A.†  Fertilizer Laboratory Technician
E. E. Leslie, B.S.†  Fertilizer Associate Chemist
Mary Lee McCrackan, A.B.†  Fertilizer Assistant Chemist
H. J. Webb, Ph.D.†  Head, Agricultural Chemistry Research, Chief Chemist and Toxicologist

Food Science and Biochemistry

W. P. Williams, Ph.D.°†  Head of Department, Professor
R. F. Borgman, D.V.M., Ph.D.†  Associate Professor
E. J. Lease, Ph.D.†  Professor
W. C. Mickelberry, Ph.D.°†  Assistant Professor

* Teaching staff.
† Research staff.
‡ Extension staff.
§ On leave.
J. H. Mitchell, Jr., Ph.D.† .......................... Professor
A. L. Shewfelt, Ph.D.*† .......................... Associate Professor
H. O. Wheeler, Ph.D.*† .......................... Assistant Professor

Forestry
Koloman Lehotsky, Ph.D.*† .......................... Head of Department, Professor
W. J. Barker, B.S.‡ .......................... Leader, Extension Forestry Work
M. H. Bruner, M.F.*† .......................... Associate Professor
B. M. Cool, Ph.D.*† .......................... Associate Professor
N. B. Goebel, M.F.† .......................... Associate Forester
C. W. Hall, B.S.‡ .......................... Extension Forester, Columbia
C. L. Lane, M.S.*† .......................... Assistant Professor
W. H. D. McGregor, Ph.D.*† .......................... Associate Professor
S. A. Marbut, B.S.† .......................... Extension Forester
W. C. Randel, Ph.D.*† .......................... Associate Professor
L. D. Reamer, B.S.‡ .......................... Assistant
R. E. Schoenike, Ph.D.*† .......................... Associate Professor
W. A. Shain, Ph.D.*† .......................... Assistant Professor
A. T. Shearin, B.S.† .......................... Assistant
J. R. Warner, D.F.*† .......................... Associate Professor

Four-H Club Work
J. B. Williams, B.S.† .......................... State 4-H Club Agent
G. H. Baker, B.S.‡ .......................... Assistant 4-H Club Agent, Florence
Wayman Johnson, M.S.‡ .......................... Associate 4-H Club Agent, State College, Orangeburg
Altamese B. Pough, B.S.‡ .......................... Assistant 4-H Club Agent, State College, Orangeburg
Margaret Sims, M.S.† .......................... Assistant 4-H Club Agent
J. T. Rogers, B.S.† .......................... Associate 4-H Club Agent
Georgia T. Roberson, M.Ed.† .......................... Associate 4-H Club Agent

Home Economics
Julia B. Taylor, M.S.† .......................... Extension House Furnishings Specialist
Ellie L. Herrick, B.S.‡ .......................... Extension Family Life Specialist
Marie S. Hindman, M.S.† .......................... Extension Nutritionist
Frances H. Odom, M.A.† .......................... Extension Housing Specialist
Vela M. Smith, M.S.† .......................... Extension Clothing Specialist
Betty P. Watkins, M.S.† .......................... Extension Consumer Information Specialist, Columbia
Ann N. Rogers, M.Ed.† .......................... Rural Civil Defense Specialist

Horticulture
T. L. Senn, Ph.D.*† .......................... Head of Department, Professor
W. C. Barnes, Ph.D.† .......................... Superintendent and Professor, Truck Station
H. A. Bowers, M.S.‡ .......................... Extension Horticulturist—Truck Crops, Barnwell
Guy L. Buckner † .......................... Horticultural Assistant, Truck Station
Henry Clay, Jr. M.S.‡ .......................... Extension Horticulturist—Ornamentals
J. H. Crawford, M.S.† .......................... Assistant Horticulturist
R. J. Ferree, M.S.† .......................... Leader, Extension Horticulture Work
J. P. Fulmer, M.S.*† .......................... Assistant Professor
C. E. Gambrell, Jr., M.S.† .......................... Assistant Horticulturist, Sandhill Station
M. G. Hamilton, Ph.D.† .......................... Associate Professor, Edisto Station
M. B. Hughes, Ph.D.† .......................... Professor, Edisto Station
K. B. Mack, M.S.† .......................... Area Agent, Charleston
J. A. Martin, B.S.† .......................... Associate Professor
W. L. Ogle, Ph.D.*† .......................... Associate Professor
R. R. Rothenberger, Ph.D.*† .......................... Assistant Professor
H. J. Sebick, M.S.*† .......................... Associate Professor
E. T. Sims, Jr., Ph.D.*† .......................... Assistant Professor

* Teaching staff.
† Research staff.
‡ Extension staff.
Public Service Activities

B. J. Skelton, M.S.*†§  Instructor
P. M. Smith, M.S.†  Extension Horticulturist—Vegetables
G. E. Stembridge, Ph.D.*†  Assistant Professor
F. W. Thode, M.S.¢  Associate Professor
L. O. Van Blaricom, M.S., Ch.E.*†  Professor

Marketing (Headquarters, Columbia)
S. P. Walker, B.S.†  Acting Leader, Extension Marketing Work
D. C. Hutchins, B.S.†  Extension Marketing Specialist
E. W. Siedschlag, B.S.†  Extension Marketing Specialist
R. D. Steer, B.S.†  Extension Cooperative Marketing Specialist, Greenwood
W. A. Tuten †  Extension Marketing Specialist

Poultry Science
B. D. Barnett, Ph.D.*†  Head of Department, Professor
B. W. Bierer, V.M.D.†  Poultry Scientist, Laboratory Director, Columbia
M. A. Boone, Ph.D.†  Associate Professor
J. B. Cooper, M.S.¢†§  Associate Professor
Douglas Hamm, Ph.D.†  Leader, Extension Poultry Science Work
C. F. Risher, B.S.†  Extension Turkey Specialist, York
J. F. Stephens, M.S.¢†  Assistant Professor
T. C. Stewart, Sr., B.S.†  Extension Poultry Science Specialist
K. L. Swiney, M.S.†  Associate Extension Poultry Science Specialist
R. O. Taylor, M.S.¢†  Lecturer
D. E. Turk, Ph.D.¢†  Assistant Professor
W. S. Walker, M.Ed.†  Extension Poultry Science Specialist, Columbia
J. F. Welter, B.S.†  Assistant

Seed Certification
R. H. Garrison, B.S.†  Head of Department, Associate Plant Breeder

Statistical Services
W. P. Byrd, Ph.D.¢†  Associate Professor

County Agents

<table>
<thead>
<tr>
<th>County</th>
<th>Name</th>
<th>Post Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbeville</td>
<td>L. H. Bull, B.S.</td>
<td>Abbeville</td>
</tr>
<tr>
<td>Aiken</td>
<td>J. H. Evans, B.S.</td>
<td>Aiken</td>
</tr>
<tr>
<td>Allendale</td>
<td>W. H. Funchess, M.S.</td>
<td>Allendale</td>
</tr>
<tr>
<td>Anderson</td>
<td>H. D. Marett, B.S.</td>
<td>Anderson</td>
</tr>
<tr>
<td>Bamberg</td>
<td>D. W. Howe, B.S.</td>
<td>Bamberg</td>
</tr>
<tr>
<td>Barnwell</td>
<td>J. B. Griffith, B.S.</td>
<td>Barnwell</td>
</tr>
<tr>
<td>Beaufort</td>
<td>W. L. Johnson, M.S.</td>
<td>Beaufort</td>
</tr>
<tr>
<td>Berkeley</td>
<td>M. C. Mason, B.S.</td>
<td>Moncks Corner</td>
</tr>
<tr>
<td>Calhoun</td>
<td>O. W. Cain, B.S.</td>
<td>St. Matthews</td>
</tr>
<tr>
<td>Charleston</td>
<td>C. J. Livingston, B.S.</td>
<td>Charleston</td>
</tr>
<tr>
<td>Cherokee</td>
<td>T. B. Lee, B.S.</td>
<td>Gaffney</td>
</tr>
<tr>
<td>Chester</td>
<td>D. C. Wylie, Jr., B.S.</td>
<td>Chester</td>
</tr>
<tr>
<td>Chesterfield</td>
<td>J. C. Willis, B.S.</td>
<td>Chesterfield</td>
</tr>
<tr>
<td>Clarendon</td>
<td>A. D. Grainger, B.S.</td>
<td>Manning</td>
</tr>
<tr>
<td>Colleton</td>
<td>J. R. White, B.S.</td>
<td>Walterboro</td>
</tr>
<tr>
<td>Darlington</td>
<td>W. J. Gray, B.S.</td>
<td>Darlington</td>
</tr>
<tr>
<td>Dillon</td>
<td>W. D. Witherspoon, B.S.</td>
<td>Dillon</td>
</tr>
<tr>
<td>Dorchester</td>
<td>D. E. Epps, B.S.</td>
<td>St. George</td>
</tr>
<tr>
<td>Edgefield</td>
<td>J. W. Gilliam, Jr., B.S.</td>
<td>Edgefield</td>
</tr>
<tr>
<td>Fairfield</td>
<td>M. H. Lynn, B.S.</td>
<td>Winnsboro</td>
</tr>
</tbody>
</table>

* Teaching staff.
† Research staff.
§ Extension staff.
§ On leave.
### Associate and Assistant County Agents

**County** | **Name** | **Post Office**
--- | --- | ---
Florence | H. F. Livingston, Jr., B.S. | Florence
Georgetown | A. E. Liebenrood, B.S. | Georgetown
Greenville | J. K. Jones, B.S. | Greenville
Greenwood | P. M. Garvin, B.S. | Greenwood
Hampton | E. C. Wallace, M.S. | Hampton
Horry | G. H. Liebenrood, M.S. | Conway
Jasper | E. G. Tate, Jr., B.S. | Ridgeland
Kershaw | W. C. McCarley, B.S. | Camden
Lancaster | F. W. Cannon, B.S. | Lancaster
Laurens | Marett Outz, B.S. | Laurens
Lee | V. F. Linder, B.S. | Bishopville
Lexington | M. A. Bouknight, B.S. | Lexington
McCormick | G. W. Bonnette, B.S. | McCormick
Marion | J. L. King, B.S. | Marion
Marlboro | E. C. Abrams, M.Agr. | Bennettsville
Newberry | A. F. Busby, B.S. | Newberry
Oconee | J. C. Morgan, B.S. | Walhalla
Orangeburg | J. C. King, B.S. | Orangeburg
Pickens | J. R. Wood, B.S. | Pickens
Richland | R. W. Bailey, B.S. | Columbia
Saluda | W. H. Craven, Jr., B.S. | Saluda
Spartanburg | W. J. Martin, B.S. | Spartanburg
Sumter | T. O. Bowen, B.S. | Sumter
Union | J. L. Cochran, B.S. | Union
Williamsburg | R. A. Jackson, B.S. | Kingstree
York | J. D. Miller, B.S. | York
**Area Agent** | K. B. Mack, M.S., Area Agent—Horticulture— | Charleston
**Area Agent** | J. D. Williams, B.S., Area Agent—Farm Management—York | 

### ASSOCIATE AND ASSISTANT COUNTY AGENTS

**County** | **Name** | **Post Office**
--- | --- | ---
Abbeville | J. S. Jones, B.S. | Abbeville
Aiken | J. D. Connor, B.S. | Aiken
Aiken | W. A. Beasley, Assoc., M.S. | Aiken
Anderson | T. A. Hammond, Assoc., B.S. | Aiken
Anderson | J. E. Barker, Assoc., M.S. | Anderson
Anderson | N. C. Anderson, Assoc., B.S. | Anderson
Anderson | R. C. McDaniel, B.S. | Anderson
Anderson | G. W. Stewart, Assoc., B.S. | Anderson
Barnwell | E. D. Dean, Assoc., M.S. | Barnwell
Barnwell | T. E. Hayden, B.S.§ | Barnwell
Barnwell | R. V. Maloney, B.S. | Barnwell
Beaufort | P. T. Seabrook, Assoc., M.S. | Beaufort
Beaufort | C. R. Tuttle, Assoc., B.S. | Beaufort
Berkeley | R. C. Bacote, Assoc., M.S. | Moncks Corner
Berkeley | C. P. Goodyear, Assoc., B.S. | Moncks Corner
Berkeley | B. S. Lawrimore, B.S. | Moncks Corner
Berkeley | K. P. Williams, B.S. | Moncks Corner
Calhoun | R. N. Chastain, B.S. | St. Matthews
Charleston | R. J. Johnson, B.S. | Charleston
Charleston | B. T. McIntosh, M.S. | Charleston
Cherokee | H. B. Pasley, B.S. | Gaffney
Cherokee | W. A. Ridgeway, Assoc., B.S. | Gaffney
Chester | M. M. Sitton, Assoc., M.S. | Chester

§ On leave.
<table>
<thead>
<tr>
<th>County</th>
<th>Name</th>
<th>Post Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chester</td>
<td>C. N. Strange, B.S.</td>
<td>Chester</td>
</tr>
<tr>
<td>Chesterfield</td>
<td>W. K. James, B.S.</td>
<td>Chesterfield</td>
</tr>
<tr>
<td>Chesterfield</td>
<td>B. L. Cunningham, Assoc., M.S.</td>
<td>Chesterfield</td>
</tr>
<tr>
<td>Chesterfield</td>
<td>A. H. Pitts, B.S.§</td>
<td>Chesterfield</td>
</tr>
<tr>
<td>Clarendon</td>
<td>J. O. Betha, Assoc., B.S.</td>
<td>Manning</td>
</tr>
<tr>
<td>Clarendon</td>
<td>Hugene Gerald, Assoc., M.S.</td>
<td>Manning</td>
</tr>
<tr>
<td>Clarendon</td>
<td>F. M. Johnson, Assoc., B.S.</td>
<td>Manning</td>
</tr>
<tr>
<td>Colleton</td>
<td>J. J. Mitchell, Assoc., M.S.</td>
<td>Walterboro</td>
</tr>
<tr>
<td>Colleton</td>
<td>W. A. Gamble, B.S.</td>
<td>Walterboro</td>
</tr>
<tr>
<td>Darlington</td>
<td>R. C. DuBose, Assoc., B.S.</td>
<td>Darlington</td>
</tr>
<tr>
<td>Darlington</td>
<td>R. C. Smith, Jr., Assoc., B.S.</td>
<td>Darlington</td>
</tr>
<tr>
<td>Dillon</td>
<td>M. S. Cely, Jr., B.S.</td>
<td>Dillon</td>
</tr>
<tr>
<td>Dorchester</td>
<td>Eugene Frederick, B.S.</td>
<td>St. George</td>
</tr>
<tr>
<td>Dorchester</td>
<td>F. O. McAlhany, B.S.</td>
<td>St. George</td>
</tr>
<tr>
<td>Edgefield</td>
<td>J. R. Meredith, Assoc., M.S.</td>
<td>Edgefield</td>
</tr>
<tr>
<td>Edgefield</td>
<td>Jackson Huskey, B.S.</td>
<td>Edgefield</td>
</tr>
<tr>
<td>Fairfield</td>
<td>D. G. Belton, Jr., B.S.</td>
<td>Winnsboro</td>
</tr>
<tr>
<td>Fairfield</td>
<td>A. D. Boggs, Assoc., B.S.</td>
<td>Winnsboro</td>
</tr>
<tr>
<td>Florence</td>
<td>W. H. Eaddy, Assoc., M.S.</td>
<td>Florence</td>
</tr>
<tr>
<td>Florence</td>
<td>E. L. Gerald, B.S.</td>
<td>Florence</td>
</tr>
<tr>
<td>Florence</td>
<td>A. J. Kinder, B.S.</td>
<td>Florence</td>
</tr>
<tr>
<td>Florence</td>
<td>J. M. Parnell, B.S.</td>
<td>Florence</td>
</tr>
<tr>
<td>Georgetown</td>
<td>J. H. Phillips, Jr., B.S.</td>
<td>Georgetown</td>
</tr>
<tr>
<td>Greenville</td>
<td>W. C. Keese, M.S.</td>
<td>Greenville</td>
</tr>
<tr>
<td>Greenville</td>
<td>G. D. Butler</td>
<td>Greenville</td>
</tr>
<tr>
<td>Greenville</td>
<td>F. D. Garrett, Assoc., B.S.</td>
<td>Greenville</td>
</tr>
<tr>
<td>Greenwood</td>
<td>E. M. Middleton, Assoc., M.S.</td>
<td>Greenwood</td>
</tr>
<tr>
<td>Greenwood</td>
<td>H. B. Gray, B.S.</td>
<td>Greenwood</td>
</tr>
<tr>
<td>Hampton</td>
<td>O. F. Huff, Assoc., B.S.</td>
<td>Hampton</td>
</tr>
<tr>
<td>Hampton</td>
<td>J. A. Spruill, Assoc., M.S.</td>
<td>Hampton</td>
</tr>
<tr>
<td>Horry</td>
<td>H. B. Hardee, B.S.</td>
<td>Conway</td>
</tr>
<tr>
<td>Horry</td>
<td>W. P. Johnson, B.S.</td>
<td>Conway</td>
</tr>
<tr>
<td>Horry</td>
<td>J. W. Pruitt, B.S.</td>
<td>Conway</td>
</tr>
<tr>
<td>Jasper</td>
<td>D. A. Inabinet, B.S.</td>
<td>Ridgeland</td>
</tr>
<tr>
<td>Kershaw</td>
<td>J. D. Marshall, Assoc., B.S.</td>
<td>Camden</td>
</tr>
<tr>
<td>Kershaw</td>
<td>R. R. Montgomery, Jr., Assoc., B.S.</td>
<td>Camden</td>
</tr>
<tr>
<td>Lancaster</td>
<td>D. R. Gowin, M.S.</td>
<td>Lancaster</td>
</tr>
<tr>
<td>Lancaster</td>
<td>C. N. Wilson, B.S.</td>
<td>Lancaster</td>
</tr>
<tr>
<td>Laurens</td>
<td>R. J. Bennett, Assoc., M.S.</td>
<td>Laurens</td>
</tr>
<tr>
<td>Laurens</td>
<td>Charlie Bronson, Jr., Assoc., M.S.</td>
<td>Laurens</td>
</tr>
<tr>
<td>Laurens</td>
<td>H. L. Eason, B.S.</td>
<td>Laurens</td>
</tr>
<tr>
<td>Lee</td>
<td>L. S. Livingston, Assoc., B.S.</td>
<td>Bishopville</td>
</tr>
<tr>
<td>Lee</td>
<td>John Mott, B.S.</td>
<td>Bishopville</td>
</tr>
<tr>
<td>Lexington</td>
<td>R. L. Boozer, Assoc., M.S.</td>
<td>Lexington</td>
</tr>
<tr>
<td>Lexington</td>
<td>W. C. Jones, Jr., B.S.</td>
<td>Lexington</td>
</tr>
<tr>
<td>Marion</td>
<td>C. A. Brown, Assoc., B.S.</td>
<td>Marion</td>
</tr>
<tr>
<td>Marion</td>
<td>M. J. Carter, Assoc., B.S.</td>
<td>Marion</td>
</tr>
<tr>
<td>Marlboro</td>
<td>Quincy Benbow, Assoc., M.S.</td>
<td>Bennettsville</td>
</tr>
<tr>
<td>Marlboro</td>
<td>R. C. Smith, B.S.</td>
<td>Bennettsville</td>
</tr>
<tr>
<td>Newberry</td>
<td>J. O. Donkle, B.S.</td>
<td>Newberry</td>
</tr>
<tr>
<td>Newberry</td>
<td>B. J. Gill, Assoc., B.S.</td>
<td>Newberry</td>
</tr>
<tr>
<td>Newberry</td>
<td>T. J. Bryson, Assoc., B.S.</td>
<td>Newberry</td>
</tr>
<tr>
<td>Oconee</td>
<td>J. O. Black, Jr., M.S.</td>
<td>Walhalla</td>
</tr>
<tr>
<td>Orangeburg</td>
<td>G. W. Dean, Assoc. Agent-at-Large, M.S. —</td>
<td>State College, Orangeburg</td>
</tr>
<tr>
<td>Orangeburg</td>
<td>J. L. Hayden, B.S.</td>
<td>Orangeburg</td>
</tr>
<tr>
<td>Orangeburg</td>
<td>A. F. Williams, M.S.</td>
<td>Orangeburg</td>
</tr>
<tr>
<td>Orangeburg</td>
<td>Reuel McLeod, B.S.</td>
<td>Orangeburg</td>
</tr>
</tbody>
</table>

§ On leave.
### COUNTY HOME DEMONSTRATION AGENTS

<table>
<thead>
<tr>
<th>County</th>
<th>Name</th>
<th>Post Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbeville</td>
<td>Sara M. Glenn, B.S.</td>
<td>Abbeville</td>
</tr>
<tr>
<td>Aiken</td>
<td>Alpha C. Jenkins, B.S.</td>
<td>Aiken</td>
</tr>
<tr>
<td>Allendale</td>
<td>Laura C. Johnson, B.S.</td>
<td>Allendale</td>
</tr>
<tr>
<td>Anderson</td>
<td>Margie Freeman, B.S.</td>
<td>Anderson</td>
</tr>
<tr>
<td>Bamberg</td>
<td>Carolyn Rikard, B.S.</td>
<td>Bamberg</td>
</tr>
<tr>
<td>Barnwell</td>
<td>Annie Mae Stanfield, B.S.</td>
<td>Barnwell</td>
</tr>
<tr>
<td>Beaufort</td>
<td>Vivian C. Gibson, B.S.</td>
<td>Beaufort</td>
</tr>
<tr>
<td>Berkeley</td>
<td>Matilda B. von Lehe, B.S.</td>
<td>Moncks Corner</td>
</tr>
<tr>
<td>Calhoun</td>
<td>Joann R. Zeigler, B.S.</td>
<td>St. Matthews</td>
</tr>
<tr>
<td>Charleston</td>
<td>Lillian R. Goldberg, B.S.</td>
<td>Charleston</td>
</tr>
<tr>
<td>Cherokee</td>
<td>Lucille B. Alsing, B.S.</td>
<td>Gaffney</td>
</tr>
<tr>
<td>Chester</td>
<td>Anne T. Padget, B.S.</td>
<td>Chester</td>
</tr>
<tr>
<td>Chesterfield</td>
<td>Lillian D. Rivers, B.S.</td>
<td>Chesterfield</td>
</tr>
<tr>
<td>Clarendon</td>
<td>Miriam F. Bigby, B.S.</td>
<td>Manning</td>
</tr>
<tr>
<td>Colleton</td>
<td>Isobel P. Heaton, B.S.</td>
<td>Walterboro</td>
</tr>
<tr>
<td>Darlington</td>
<td>Sara E. Roper, B.S.</td>
<td>Darlington</td>
</tr>
<tr>
<td>Dillon</td>
<td>Joyce C. Wannamaker, B.S.</td>
<td>Dillon</td>
</tr>
<tr>
<td>Dorchester</td>
<td>Evelyn Davis, B.S.</td>
<td>St. George</td>
</tr>
<tr>
<td>Edgefield</td>
<td>Dorothy O. Herlong, B.S.</td>
<td>Edgefield</td>
</tr>
<tr>
<td>Fairfield</td>
<td>Theresa Beckham, B.S.</td>
<td>Winnsboro</td>
</tr>
<tr>
<td>Florence</td>
<td>Eleanor M. Foster, B.S.</td>
<td>Florence</td>
</tr>
<tr>
<td>Georgetown</td>
<td>Mary B. Mixson, B.S.</td>
<td>Georgetown</td>
</tr>
<tr>
<td>Greenville</td>
<td>M. Myrtle Nesbitt, B.S.</td>
<td>Greenville</td>
</tr>
<tr>
<td>Greenwood</td>
<td>A. Louise McColl, B.S.</td>
<td>Greenwood</td>
</tr>
<tr>
<td>Hampton</td>
<td>Rebecca G. Platts, B.S.</td>
<td>Hampton</td>
</tr>
<tr>
<td>Horry</td>
<td>Nancy F. Collins, B.S.</td>
<td>Conway</td>
</tr>
<tr>
<td>Jasper</td>
<td>Elizabeth B. Berry, B.S.</td>
<td>Ridgeland</td>
</tr>
<tr>
<td>Kershaw</td>
<td>Dean H. Lucas, B.S.</td>
<td>Camden</td>
</tr>
<tr>
<td>Lancaster</td>
<td>Lena E. Sturgis, B.S.</td>
<td>Lancaster</td>
</tr>
<tr>
<td>Laurens</td>
<td>Myrtlece Taylor, B.S.</td>
<td>Laurens</td>
</tr>
<tr>
<td>Lee</td>
<td>Carolyn Meares, B.S.</td>
<td>Bishopville</td>
</tr>
<tr>
<td>Lexington</td>
<td>Margaret G. McFadden, B.S.</td>
<td>Lexington</td>
</tr>
<tr>
<td>McCormick</td>
<td>Hopkins Sharp, B.S.</td>
<td>McCormick</td>
</tr>
<tr>
<td>Marion</td>
<td>Sallie M. Smith, B.S.</td>
<td>Marion</td>
</tr>
</tbody>
</table>
### Public Service Activities

<table>
<thead>
<tr>
<th>County</th>
<th>Name</th>
<th>Post Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marlboro</td>
<td>Louise Heriot, M.Ed.</td>
<td>Bennettsville</td>
</tr>
<tr>
<td>Newberry</td>
<td>Mildred K. Holliday, B.S.</td>
<td>Newberry</td>
</tr>
<tr>
<td>Oconee</td>
<td>Hazle D. Wise, B.S.</td>
<td>Walhalla</td>
</tr>
<tr>
<td>Orangeburg</td>
<td>Huldah P. McKnight, B.S.</td>
<td>Orangeburg</td>
</tr>
<tr>
<td>Pickens</td>
<td>Sarah G. Cureton, B.S.</td>
<td>Pickens</td>
</tr>
<tr>
<td>Richland</td>
<td>Marguerite Summer, B.S.</td>
<td>Columbia</td>
</tr>
<tr>
<td>Saluda</td>
<td>Catherine S. Booser, B.S.</td>
<td>Saluda</td>
</tr>
<tr>
<td>Spartanburg</td>
<td>Nancy H. Williams, B.S.</td>
<td>Spartanburg</td>
</tr>
<tr>
<td>Sumter</td>
<td>Evangeline F. Thompson, B.S.</td>
<td>Sumter</td>
</tr>
<tr>
<td>Union</td>
<td>Judith L. Glover, B.S.</td>
<td>Union</td>
</tr>
<tr>
<td>Williamsburg</td>
<td>Carrie C. Tomlinson, M.A.</td>
<td>Kingstree</td>
</tr>
<tr>
<td>York</td>
<td>Jennie M. Riddle, B.S.</td>
<td>York</td>
</tr>
</tbody>
</table>

#### ASSOCIATE AND ASSISTANT HOME DEMONSTRATION AGENTS

<table>
<thead>
<tr>
<th>County</th>
<th>Name</th>
<th>Post Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aiken</td>
<td>Lonieal H. Jackson, Assoc., B.S.</td>
<td>Aiken</td>
</tr>
<tr>
<td>Aiken</td>
<td>Hazel M. Jenkinson, B.S.</td>
<td>Aiken</td>
</tr>
<tr>
<td>Allendale</td>
<td>Annie M. Butler, Assoc., B.S.</td>
<td>Allendale</td>
</tr>
<tr>
<td>Anderson</td>
<td>Annie R. Thomas, B.S.</td>
<td>Anderson</td>
</tr>
<tr>
<td>Anderson</td>
<td>Carolyn Kitchens, B.S.</td>
<td>Anderson</td>
</tr>
<tr>
<td>Anderson</td>
<td>Cynthia W. Williford, Assoc., M.S.</td>
<td>Anderson</td>
</tr>
<tr>
<td>Bamberg</td>
<td>Lillie J. Limehouse, Assoc., B.S.</td>
<td>Bamberg</td>
</tr>
<tr>
<td>Barnwell</td>
<td>Edna K. DuPree, Assoc., B.S.</td>
<td>Barnwell</td>
</tr>
<tr>
<td>Beaufort</td>
<td>Mabel P. Washington, Assoc., B.S.</td>
<td>Beaufort</td>
</tr>
<tr>
<td>Berkeley</td>
<td>Elizabeth Baxley, B.S.</td>
<td>Moncks Corner</td>
</tr>
<tr>
<td>Berkeley</td>
<td>Doris T. Dauphiney, B.S.</td>
<td>Moncks Corner</td>
</tr>
<tr>
<td>Charleston</td>
<td>Christine O. Jackson, B.S.</td>
<td>Charleston</td>
</tr>
<tr>
<td>Cherokee</td>
<td>Leota M. Sherard, B.S.</td>
<td>Gaffney</td>
</tr>
<tr>
<td>Chesterfield</td>
<td>Ramona L. Lawton, M.S.</td>
<td>Chesterfield</td>
</tr>
<tr>
<td>Chesterfield</td>
<td>Queen E. Bowman, B.S.</td>
<td>Chesterfield</td>
</tr>
<tr>
<td>Clarendon</td>
<td>Yvonne B. Campbell, B.S.</td>
<td>Manning</td>
</tr>
<tr>
<td>Clarendon</td>
<td>Jean E. Thomas, B.S.</td>
<td>Manning</td>
</tr>
<tr>
<td>Colleton</td>
<td>Darlena Dugger, B.S.</td>
<td>Walterboro</td>
</tr>
<tr>
<td>Colleton</td>
<td>Cussie M. Goudlock, Assoc., B.S.</td>
<td>Walterboro</td>
</tr>
<tr>
<td>Darlington</td>
<td>Jacquelyn Sturgis, B.S.</td>
<td>Darlington</td>
</tr>
<tr>
<td>Darlington</td>
<td>Wilhelmina P. Johnson, B.S.</td>
<td>Darlington</td>
</tr>
<tr>
<td>Dillon</td>
<td>Barbara Berry, B.S.</td>
<td>Dillon</td>
</tr>
<tr>
<td>Dorchester</td>
<td>Bernice H. Brown, B.S.</td>
<td>St. George</td>
</tr>
<tr>
<td>Edgefield</td>
<td>Phyllis A. Jeffcoat, B.S.</td>
<td>Edgefield</td>
</tr>
<tr>
<td>Fairfield</td>
<td>Coy Smith, B.S.</td>
<td>Winnsboro</td>
</tr>
<tr>
<td>Florence</td>
<td>Rosa T. Baker, B.S.</td>
<td>Florence</td>
</tr>
<tr>
<td>Florence</td>
<td>Shirley A. Harris, B.S.</td>
<td>Florence</td>
</tr>
<tr>
<td>Florence</td>
<td>Hattie P. Lowery, Assoc., B.S.</td>
<td>Florence</td>
</tr>
<tr>
<td>Florence</td>
<td>Gene M. Sandersen, B.S.</td>
<td>Florence</td>
</tr>
<tr>
<td>Georgetown</td>
<td>Janie Lancaster, M.S.</td>
<td>Georgetown</td>
</tr>
<tr>
<td>Greenville</td>
<td>Shirley B. Whitson, B.S.</td>
<td>Greenville</td>
</tr>
<tr>
<td>Greenwood</td>
<td>Madge W. Hardy, Assoc., B.S.</td>
<td>Greenwood</td>
</tr>
<tr>
<td>Hampton</td>
<td>Leona B. Mungin, Assoc., B.S.</td>
<td>Hampton</td>
</tr>
<tr>
<td>Horry</td>
<td>Susan K. Brown, B.S.</td>
<td>Conway</td>
</tr>
<tr>
<td>Horry</td>
<td>Marian M. Watson, B.S.</td>
<td>Conway</td>
</tr>
<tr>
<td>Kershaw</td>
<td>Nancy E. Smith, B.S.</td>
<td>Camden</td>
</tr>
<tr>
<td>Kershaw</td>
<td>Adell W. Watson, B.S.</td>
<td>Camden</td>
</tr>
<tr>
<td>Laurens</td>
<td>Belvia M. Hegler, B.S.</td>
<td>Laurens</td>
</tr>
<tr>
<td>Lee</td>
<td>Betty J. Sudluth, B.S.</td>
<td>Bishopville</td>
</tr>
<tr>
<td>Lee</td>
<td>McPhine J. Brooks, M.Ed.</td>
<td>Bishopville</td>
</tr>
<tr>
<td>Lexington</td>
<td>Emily J. Bonds, B.S.</td>
<td>Lexington</td>
</tr>
<tr>
<td>Lexington</td>
<td>Judith L. Bailey, B.S.</td>
<td>Lexington</td>
</tr>
<tr>
<td>County</td>
<td>Name</td>
<td>Post Office</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Marion</td>
<td>Claire M. Baker, B.S.</td>
<td>Marion</td>
</tr>
<tr>
<td>Marion</td>
<td>Shirley M. Patterson, B.S.</td>
<td>Marion</td>
</tr>
<tr>
<td>Newberry</td>
<td>Marie M. Bussey, B.S.</td>
<td>Newberry</td>
</tr>
<tr>
<td>Newberry</td>
<td>Lillian G. Saunders, Assoc., B.S.</td>
<td>Newberry</td>
</tr>
<tr>
<td>Oconee</td>
<td>Carolyn Patterson, B.S.</td>
<td>Walhalla</td>
</tr>
<tr>
<td>Orangeburg</td>
<td>Rosa R. Odom, Assoc., B.S.</td>
<td>Orangeburg</td>
</tr>
<tr>
<td>Orangeburg</td>
<td>Geraldine R. Shuler, B.S.</td>
<td>Orangeburg</td>
</tr>
<tr>
<td>Pickens</td>
<td>Julia S. Daniel, B.S.</td>
<td>Pickens</td>
</tr>
<tr>
<td>Richland</td>
<td>Gertrude H. Sanders, Assoc., B.S.</td>
<td>Columbia</td>
</tr>
<tr>
<td>Richland</td>
<td>Dorothy W. Williams, B.S.</td>
<td>Columbia</td>
</tr>
<tr>
<td>Saluda</td>
<td>Patricia A. Rasor, B.S.</td>
<td>Saluda</td>
</tr>
<tr>
<td>Spartanburg</td>
<td>Cammie F. Clagett, Assoc., B.S.</td>
<td>Spartanburg</td>
</tr>
<tr>
<td>Spartanburg</td>
<td>Carolyn Coleman, B.S.</td>
<td>Spartanburg</td>
</tr>
<tr>
<td>Spartanburg</td>
<td>Eula E. Alewine, B.S.</td>
<td>Spartanburg</td>
</tr>
<tr>
<td>Sumter</td>
<td>Cynthia J. Carlson, B.S.</td>
<td>Sumter</td>
</tr>
<tr>
<td>Union</td>
<td>Laura M. Whitney, Assoc., B.S.</td>
<td>Union</td>
</tr>
<tr>
<td>Williamsburg</td>
<td>Mary A. McNeill, B.S.</td>
<td>Kingstree</td>
</tr>
<tr>
<td>Williamsburg</td>
<td>Eva G. Lawrence, Assoc., B.S.</td>
<td>Kingstree</td>
</tr>
<tr>
<td>York</td>
<td>Johnnie G. Sloan, Assoc., B.S.</td>
<td>York</td>
</tr>
<tr>
<td>York</td>
<td>Dorothy A. Coln, B.S.</td>
<td>York</td>
</tr>
</tbody>
</table>

**EXTENSION SERVICE EMERITI**

Lora Warner Alford, B.S. ...................... County Agent Emeritus  
Caroline Simonton Alston ...................... Home Demonstration Agent Emeritus  
John Chipley Anthony, B.A. ..................... County Agent Emeritus  
Delphena Wilkerson Arnold, L.I., Assoc. Home Demonstration Agent Emeritus  
Ophelia Sue Barker, B.S. ...................... Home Demonstration Agent Emeritus  
Benjamin Barnwell .............................. Associate County Agent Emeritus  
Elizabeth DuBose Boykin, A.B. ................ Home Demonstration Agent Emeritus  
Harry Gilmore Boylston, B.S. ................ Extension Cotton Improvement Specialist Emeritus  
Lillian Watts Brown, L.I. ...................... Associate Home Demonstration Agent Emeritus  
Charles Babb Cannon, B.S. ...................... County Agent Emeritus  
Claude William Carraway, B.S. ................ County Agent Emeritus  
Eleanor DeVeaux Carson, A.B., M.S. ............ Home Demonstration Agent Emeritus  
Mattie Lee Cooley, B.S. ....................... Home Demonstration Agent Emeritus  
Carl Golden Cushman, B.S. ...................... Leader Emeritus, Dairy Extension Work  
George Washington Daniels, L.I. .............. Associate County Agent Emeritus  
James Ervin Dickson, B.S. ...................... Associate County Agent Emeritus  
Spencer Cholier Disher, L.I. ................... Associate County Agent Emeritus  
Augustus Lowery DuRant, B.S., M.S. .......... Leader, Livestock Work Emeritus  
James Malcolm Eleazer, B.S. ................ Extension Information Specialist Emeritus  
Silas Wightman Epps, B.S. ...................... County Agent Emeritus  
Samuel Ernest Evans, B.S., M.S. .............. County Agent Emeritus  
Paul Bryson Ezell, B.S. ....................... County Agent Emeritus  
Margaret Barron Fewell, B.A. ................ Home Demonstration Agent Emeritus  
Louise Fleming, A.B. ......................... Home Demonstration Agent Emeritus  
Rosa Gibbs Gadson, L.I. ....................... Associate Home Demonstration Agent Emeritus  
Minnie Estha Candy ............................ Associate Home Demonstration Agent Emeritus  
Percy Harold Gooding, B.S., M.S. .......... Leader, Poultry Extension Work Emeritus  
William Roy Gray, B.S. ....................... County Agent Emeritus  
Mary Catherine Haynie, B.A. .................. Home Demonstration Agent Emeritus  
Elizabeth Herbert, B.A. ...................... Home Demonstration Agent Emeritus  
Mamie Sue Hicks, B.S. ......................... Home Demonstration Agent Emeritus  
Jesse Howard Hopkins, Sr., B.S. ............ County Agent Emeritus  
Julia Stebbins Howerton ....................... Home Demonstration Agent Emeritus  
Harriett Frazier Johnson, A.B., B.S., M.A. State Girls' Club Agent Emeritus  
Vernon Morris Johnston, B.S. ................ County Agent Emeritus
Jane Ketchen, B.A. . . . . Assistant State Home Demonstration Agent Emeritus
Lonny Inge Landrum, B.S. . . . . State Home Demonstration Agent Emeritus
Jamie Tarlton Lazar, B.S. . . . . District Agent Emeritus
Robert Howe Lemmon, B.S. . . . . County Agent Emeritus
Janie Letitia McDill, A.B., B.S., M.S. . . . . Nutritionist Emeritus
Goldie Evangeline McDuffie, B.S. . . . . Assistant Home Demonstration Agent Emeritus

Henry Abner McGee . . . . Extension Tobacco Specialist Emeritus
Colin McLaurin, B.S. . . . . County Agent Emeritus
Elizabeth McNab, A.B. . . . . Home Demonstration Agent Emeritus
Margaret Martin, B.A., M.A. . . . . Extension Food Production and Conservation Specialist Emeritus

Russell Ramsey Mellette, B.S. . . . . County Agent Emeritus
Booker Talifero Miller, B.S. . . . . Associate County Agent Emeritus
Izora Miley . . . . Home Demonstration Agent Emeritus
Juanita Henderson Neely, A.B., M.S., State Home Demonstration Agent Emeritus
Marian Baxter Paul, B.S. . . . . Assistant in Home Economics Extension Emeritus
Theodosis Dargan Plowden . . . . District Agent Emeritus
Portia Seabrook, A.B., M.S. . . . . Extension Clothing Specialist Emeritus
Etta Sue Sellers, B.A. . . . . Home Demonstration Agent Emeritus
Mahala Jane Smith, B.S. . . . . Home Demonstration Agent Emeritus
Stiles Conger Stribling, B.S. . . . . Agriculture Editor Emeritus
William Thompson, B.S. . . . . Associate County Agent Emeritus
Ernest Craig Turner, B.S. . . . . Extension Conservationist Emeritus
Larkin Vandiville Walker, B.S. . . . . Associate County Agent Emeritus
Audley Hoffman Ward, B.S., M.S. . . . . District Agent Emeritus
David Wayne Watkins, B.S., M.A. . . . . Director Emeritus

LIVESTOCK-POULTRY HEALTH DEPARTMENT
P. O. Box 1771
COLUMBIA, SOUTH CAROLINA

Director and State Veterinarian
C. E. Boyd, D.V.M. . . . . Columbia

State Associate Director
John B. Thomas, D.V.M. . . . . Columbia

Federal Assistant Director
John A. Kimsey, D.V.M. . . . . Columbia

Chief, Meat Inspection Program
Elmer W. Young, D.V.M. . . . . Columbia

Assistant State Veterinarians
O. E. Baker, D.V.M. . . . . Columbia
Bert W. Bierer, V.M.D. . . . . Columbia
Walter T. Carll, D.V.M. . . . . Columbia
W. R. Chastain, D.V.M. . . . . Columbia
T. H. Eleazer, D.V.M. . . . . Columbia
Charles E. Graddick, D.V.M. . . . . Greenwood
S. L. Moore, D.V.M. . . . . Clemson
H. S. Powell, D.V.M. . . . . Columbia
W. H. Rhodes, D.V.M. . . . . Columbia
Jack Scott, D.V.M. . . . . Hemingway

Virologist
Doyle E. Roebuck, Ph.D. . . . . Columbia
Livestock-Poultry Health Department 291

State Laboratory Assistants

Jack C. Fortner ........................................ Columbia
Peggy L. Kelly ........................................ Columbia
Furman Peake ........................................ Columbia
Willard Robinson ..................................... Columbia

State Livestock Law Enforcement Officers

James C. Epps, Jr., B.Sc. .................................. Columbia
Charles L. Fleming, B.Sc. .................................. Columbia
Charles E. Grant, B.Sc. .................................... Columbia

State Livestock Quarantine Officers

J. H. Cope, B.Sc. ............................................. Cope
Laurie D. Morris ........................................... Hemingway

Livestock Inspectors

Jake P. Ginn, Jr., B.Sc. .................................... Varnville
DeWitt W. Maxey .......................................... Spartanburg
P. M. Snowden ............................................. Hemingway

State Clerical

Mary F. Brown ............................................ Columbia
Addie E. Colclough Byrd ................................... Columbia
Wilma M. Campbell ......................................... Columbia
Chester B. Collins ......................................... Columbia
Carolyn W. Jacobs ......................................... Columbia
John B. Klugh ............................................ Columbia
I. Lee Motley ................................................ Columbia
C. M. Steele, Sr. ........................................... Columbia

Federal Veterinary Livestock Inspectors

G. A. Baker, D.V.M. ......................................... Columbia
M. L. Gunnels, Jr., D.V.M. .................................. Walterboro
Wm. S. Jackson, D.V.M. .................................... Orangeburg
M. C. Johnson, D.V.M. ....................................... Camden
H. A. Jordan, D.V.M. ......................................... Timmonsville
J. M. Love, D.V.M. .......................................... Chester
Herbert Racoff, D.V.M., M.S. ................................ Columbia
K. N. Wiser, D.V.M. .......................................... Columbia

Federal Laboratory Assistants

Evelyn M. Goff .............................................. Columbia
Wayne Lovette ............................................. Columbia

Federal Livestock Inspectors

James W. Crowder, Jr. ...................................... Rock Hill
Thomas R. Davis .......................................... Clinton
Everett L. Davison .......................................... Cheraw
Julian L. Morris ........................................... Lake City
Bernard B. Oswald ......................................... Lexington
James A. Ritter, Jr. ......................................... Walterboro
Roscoe N. Rivers ........................................... Greenville
John G. Smith, B.Sc. ........................................ Orangeburg
Roy D. Wingard, B.Sc. ...................................... Columbia

Federal Clerical

Mary Rhodes Cothran, B.Sc. ................................ Columbia
Francis L. Eargle ........................................... Columbia
William H. Helms, Jr. ...................................... Columbia
Ida B. Strickland ........................................... Columbia
Elizabeth T. Webster, A.B. ................................ Columbia
Maude E. West ............................................. Columbia
Margaret W. Whitworth ................................... Columbia
State-Federal Accredited Veterinarians

Leslie H. Ahrens, D.V.M. .................................................. Columbia
E. C. Anderson, D.V.M. .................................................. Clemson
Henry M. Anderson, D.V.M. ............................................. Florence
R. E. Atkinson, D.V.M. .................................................. Kingstree
N. J. Ayers, D.V.M. ...................................................... Greenville
O. E. Ballenger, D.V.M. .................................................. Easley
W. R. Beasley, D.V.M. .................................................... Batesburg
R. W. Beaty, Jr., D.V.M. .................................................. Sumter
M. R. Blackstock, D.V.M. ............................................... Spartanburg
James E. Brehm, D.V.M. .................................................. Surfside Beach
Wayne Brooks, D.V.M. .................................................... Greenville
David L. Brown, Jr., D.V.M. .............................................. Florence
T. E. Brown, D.V.M. ...................................................... Spartanburg
Jones W. Bryan, D.V.M. .................................................. Fairfax
J. E. Burch, D.V.M. ........................................................ Lake City
Stuart E. Burnett, D.V.M. ............................................... Sumter
T. L. Burriss, D.V.M. ...................................................... Anderson
W. M. Burriss, D.V.M. ..................................................... Anderson
W. S. Carr, D.V.M. .......................................................... Aiken
F. P. Caughman, B.Sc., D.V.M. ......................................... Columbia
F. P. Caughman, Jr., D.V.M. .............................................. Columbia
C. W. Colquitt, D.V.M. .................................................... Barnwell
I. R. Cooper, Sr., D.V.M. ................................................ Allendale
W. C. Cottingham, D.V.M. ............................................... Kingstree
Jack R. Cox, D.V.M. ........................................................ Myrtle Beach
M. D. Culpepper, D.V.M. .................................................... Chester
John N. Dalton, D.V.M. .................................................... Bamberg
J. W. Dantzler, D.V.M. ..................................................... Orangeburg
J. T. Dickson, D.V.M. ........................................................ Rock Hill
C. M. Dotson, D.V.M. ........................................................ Lancaster
F. E. Ducey, Jr., D.V.M. ..................................................... Ridgeland
Will T. Dunn, D.V.M. ........................................................ Greenville
H. P. Dyches, D.V.M. ........................................................ Aiken
R. M. Edwards, Jr., D.V.M. ............................................... Columbia
James A. Eidson, Jr., D.V.M. .............................................. Florence
Wm. S. Fairey, D.V.M. ..................................................... Orangeburg
J. C. Frazier, D.V.M. ........................................................ Greenville
Edwin L. Freeman, Jr., D.V.M. ......................................... North Charleston
H. L. Frieze, D.V.M. .......................................................... Gaffney
T. F. Fussell, D.V.M. ........................................................ Spartanburg
S. P. Galphin, D.V.M. ...................................................... Holly Hill
J. C. Gibson, D.V.M. ........................................................ Florence
Thomas Gibson, D.V.M. .................................................... Charleston
W. H. Giddens, D.V.M. .................................................. Saluda
W. H. Gilmore, D.V.M. ..................................................... Columbia
D. E. Goodman, D.V.M. .................................................... Florence
L. H. Hardy, D.V.M. .......................................................... Camden
C. C. Harmon, D.V.M. ...................................................... Columbia
J. W. Hawk, D.V.M. .......................................................... North Augusta
Hugh A. Hayes, D.V.M. ................................................... Spartanburg
Carlos Helms, D.V.M. ................................................... Crescent Beach
Wm. S. Hicks, D.V.M. ..................................................... Columbia
W. G. Hill, D.V.M. ............................................................ Abbeville
C. R. Hinson, D.V.M. ........................................................ Bennettsville
R. R. Hirshberg, D.V.M. .................................................... Sumter
T. P. Hoffmeyer, D.V.M. .................................................... Florence
L. J. Hogan, D.V.M. ....................................................... Charleston
E. G. Horres, D.V.M. ........................................................ Charleston
E. B. Hubster, D.V.M. ........................................................ Walterboro
<table>
<thead>
<tr>
<th>Name</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenneth L. Huggins</td>
<td>Dillon</td>
</tr>
<tr>
<td>James W. Hutto</td>
<td>Holly Hill</td>
</tr>
<tr>
<td>C. V. Jameson</td>
<td>Anderson</td>
</tr>
<tr>
<td>T. H. Jamison</td>
<td>Orangeburg</td>
</tr>
<tr>
<td>Preston B. Jones</td>
<td>Anderson</td>
</tr>
<tr>
<td>William L. Jones</td>
<td>Anderson</td>
</tr>
<tr>
<td>S. J. Kellett, Jr.</td>
<td>Seneca</td>
</tr>
<tr>
<td>H. R. Kemmerlin</td>
<td>Charleston</td>
</tr>
<tr>
<td>H. B. Kinard, Jr.</td>
<td>Greenwood</td>
</tr>
<tr>
<td>H. W. Kinard</td>
<td>Bamberg</td>
</tr>
<tr>
<td>G. R. Kitchen</td>
<td>Sumter</td>
</tr>
<tr>
<td>T. E. Lanham</td>
<td>Edgefield</td>
</tr>
<tr>
<td>W. R. Latta</td>
<td>Orangeburg</td>
</tr>
<tr>
<td>G. J. Lawhon, Sr.</td>
<td>Hartsville</td>
</tr>
<tr>
<td>G. J. Lawhon, Jr.</td>
<td>Hartsville</td>
</tr>
<tr>
<td>J. S. Lide</td>
<td>Newberry</td>
</tr>
<tr>
<td>C. B. Lowman</td>
<td>Newberry</td>
</tr>
<tr>
<td>Earl A. McDowell</td>
<td>Greenville</td>
</tr>
<tr>
<td>C. A. McElmurray</td>
<td>Aiken</td>
</tr>
<tr>
<td>Carl D. McElveen</td>
<td>Columbia</td>
</tr>
<tr>
<td>Wayne McGee</td>
<td>Anderson</td>
</tr>
<tr>
<td>B. K. McInnis, M.D.</td>
<td>Charleston</td>
</tr>
<tr>
<td>B. G. McLean, V.M.D.</td>
<td>Aiken</td>
</tr>
<tr>
<td>S. R. McMaster</td>
<td>Rock Hill</td>
</tr>
<tr>
<td>F. A. McWilliams</td>
<td>Greenville</td>
</tr>
<tr>
<td>C. J. Maddox</td>
<td>Sumter</td>
</tr>
<tr>
<td>W. K. Magill, B.Sc.</td>
<td>Chester</td>
</tr>
<tr>
<td>W. H. Matthews</td>
<td>Rock Hill</td>
</tr>
<tr>
<td>W. D. Mayfield</td>
<td>Laurens</td>
</tr>
<tr>
<td>J. W. Miller</td>
<td>Winnsboro</td>
</tr>
<tr>
<td>A. S. Moore</td>
<td>Walterboro</td>
</tr>
<tr>
<td>G. E. H. Moore</td>
<td>Walterboro</td>
</tr>
<tr>
<td>E. E. Nissen</td>
<td>Marion</td>
</tr>
<tr>
<td>D. E. Orr</td>
<td>Clinton</td>
</tr>
<tr>
<td>A. B. Pittman</td>
<td>Springfield</td>
</tr>
<tr>
<td>Neil D. Porter</td>
<td>West Columbia</td>
</tr>
<tr>
<td>Bruce G. Pratt</td>
<td>Beaufort</td>
</tr>
<tr>
<td>Petro Pshyk</td>
<td>Summerville</td>
</tr>
<tr>
<td>G. D. Radford</td>
<td>Beaufort</td>
</tr>
<tr>
<td>Paul E. Ramsey</td>
<td>Spartanburg</td>
</tr>
<tr>
<td>W. F. Rawlinson</td>
<td>Manning</td>
</tr>
<tr>
<td>T. M. Rhodes</td>
<td>Charleston Heights</td>
</tr>
<tr>
<td>E. A. Richardson</td>
<td>Seneca</td>
</tr>
<tr>
<td>H. E. Riddle</td>
<td>Greenville</td>
</tr>
<tr>
<td>L. D. Rodgers</td>
<td>Greenwood</td>
</tr>
<tr>
<td>R. R. Salley</td>
<td>Orangeburg</td>
</tr>
<tr>
<td>W. Everette Salley</td>
<td>Orangeburg</td>
</tr>
<tr>
<td>J. W. Sample, Jr.</td>
<td>Charleston Heights</td>
</tr>
<tr>
<td>W. H. Shirer</td>
<td>Georgetown</td>
</tr>
<tr>
<td>T. J. Shirley, Jr.</td>
<td>Pendleton</td>
</tr>
<tr>
<td>F. L. Shuler</td>
<td>St. George</td>
</tr>
<tr>
<td>J. O. Shuler</td>
<td>Mt. Pleasant</td>
</tr>
<tr>
<td>G. K. Smith</td>
<td>Spartanburg</td>
</tr>
<tr>
<td>G. M. Smith</td>
<td>Greenville</td>
</tr>
<tr>
<td>J. S. Smith</td>
<td>Conway</td>
</tr>
<tr>
<td>D. H. Spearman</td>
<td>Greenville</td>
</tr>
<tr>
<td>J. D. Stith</td>
<td>Hartsville</td>
</tr>
<tr>
<td>A. Fred Stringer, Jr.</td>
<td>Anderson</td>
</tr>
<tr>
<td>Otto M. Strock</td>
<td>Charleston</td>
</tr>
<tr>
<td>E. D. Stuart</td>
<td>Greenville</td>
</tr>
<tr>
<td>Pat Suber</td>
<td>Columbia</td>
</tr>
</tbody>
</table>
H. L. Sutherland, D.V.M. .................................................... Union
Robert C. Thrasher, D.V.M. .................................................. Greenville
E. R. Van De Grift, D.V.M. .................................................... Columbia
Pierre Wait, D.V.M. ........................................................... Myrtle Beach
H. A. Webb, D.V.M. ............................................................ Georgetown
Brunson M. Westbury, D.V.M. ............................................... Summerville
U. E. Whatley, D.V.M. ....................................................... Dillon
W. E. White, D.V.M. ........................................................... Bennettsville
J. M. Williams, D.V.M. ....................................................... Moncks Corner
R. L. Willis, D.V.M. ........................................................... Charleston
S. M. Witherspoon, B.Sc., D.V.M. .......................................... Marion
R. E. Wright, D.V.M. ........................................................... Greer
L. E. Young, D.V.M. ........................................................... Columbia

Technical Livestock Committee

C. E. Boyd, D.V.M., Chairman ............................................ Box 1771, Columbia
W. L. Abernathy .................................................................. Box 5, Chester
O. A. Argoe ........................................................................ Charleston Highway, Orangeburg
Dan Hutto ............................................................................ Holly Hill
Ellis Monroe ......................................................................... Moore
T. C. Moss ............................................................................ Cameron
W. C. Smith ......................................................................... Shop Road, Columbia

THE SOUTH CAROLINA AGRICULTURAL EXPERIMENT STATION

With a nucleus of research planning at Clemson, the South Carolina Agricultural Experiment Station has 16 departments and 2 special units located here. Each department conducts specialized research in its own field, and its findings are made known to the public through special publications and news releases. Six branch experiment stations operate as separate units in different sections of the State, under the direction and organization of the Clemson Station.

More effective agricultural production and marketing through research is the goal of the Station. The farmer's work can be made easier, cheaper, and more profitable by research to learn what effect current farmer practice has on the financial return he gets. Newer methods not yet put into use by farmers are also studied with appropriate release of findings.

Opportunity to work and gain experience is offered to a limited number of students by some departments where research is conducted. Laboratories are open to inspection by students, farmers, and others. The public is invited to write to the Station Director to request information about any specific problem encountered in agriculture. A full report of work and expenditures of the S. C. Agricultural Experiment Station is published annually and may be obtained free of charge. Other publications of the Station are also free and will be sent upon request.

Research at the Station embraces problems peculiar to the Southeast as well as to the State, and results receive nationwide publi-
cation through USDA releases. The Station’s work is financed by State appropriation, Federal appropriation, grants from commercial companies and foundations, and returns from products grown for research.

FERTILIZER INSPECTION AND ANALYSIS

The Fertilizer Inspection and Analysis Department is charged with the enforcement of the South Carolina Fertilizer Law. In addition to procuring official samples for analysis to see that the guarantees are met, the department inspects for proper bag printing and weights of fertilizers. It also makes analyses of insecticides, unexploited sources of water, and minerals. The 10 part-time fertilizer inspectors are also deputized as insecticide inspectors. This arrangement is satisfactory, and it not only represents a consider- able saving to Clemson University but it also more efficiently serves the dealers and farmers. A large number of fertilizer dealers are also insecticide dealers.

Approximately 7,000 fertilizer samples are procured annually. Usually, six to seven per cent of these samples are deficient in analysis, which necessitates the manufacturers making penalty refunds to the ultimate users from $18,000 to $25,000 annually. Farmers are normally refunded 30 to 40 tons of fertilizer on account of short weights. Specific figures are available on all refunds in the Annual Bulletins. The department also procures and analyzes between 1,500 to 2,000 insecticide samples annually.

THE CLEMSON UNIVERSITY EXTENSION SERVICE

The Clemson University Extension Service is a branch of Clemson University and is a cooperative service supported by the counties, the State, and the Federal government. The Extension Service is responsible for conducting, with all people of South Carolina, the cooperative educational and demonstration programs in agriculture and home economics of Clemson University and the United States Department of Agriculture.

The function of the Extension Service is to make available to farmers, homemakers, and rural boys and girls, through on-the-farm service, demonstrations, meetings, newspaper articles, publications, radio and television broadcasts, and other suitable methods, the results of research and successful farm and home experience. The Service also assists, through interpretation, practical demonstrations and otherwise, in applying and using this information to improve farms, farm homes, and communities, to the end that a safe, sound, and progressive rural life and agriculture may be built.
The annual plan of agricultural and home economics extension work is developed and carried out with close cooperation between the Extension Service and the farm and home leadership of the State, the counties, and the rural communities and neighborhoods.

The Staff of Agricultural Extension Workers includes the director, an associate director, 3 district supervisory agents, an administrative assistant, an assistant in agricultural extension, 46 county agents—one in each county, two area agents, 50 associate county agents, 52 assistant county agents, and 55 agricultural specialists in agricultural economics, agricultural engineering, agronomy, 4-H club work, dairying, crop insects and diseases, cotton ginning, forestry, horticulture, animal science, marketing, poultry and turkeys, publications, community and rural development, soil conservation, and visual instruction.

The Extension Home Demonstration Staff includes a state home demonstration agent, 3 associate district supervisory agents, an assistant in home economics extension, 46 county home demonstration agents—one in each county, 17 associate home demonstration agents, 45 assistant home demonstration agents, and 12 specialists in clothing, family life, food production and conservation, 4-H club work, home management, marketing, rural civil defense, and nutrition.

LIVESTOCK-POULTRY HEALTH DEPARTMENT

The Clemson University Livestock-Poultry Health Department is consolidated under one Director with the United States Department of Agriculture, Agricultural Research Service. Animal Disease Eradication Division, and is known as the State-Federal Livestock Disease Eradication Program. This department is charged with the control and eradication of contagious, infectious and communicable diseases of livestock and poultry and with the intra-state and inter-state movement of livestock and poultry. When requested, investigations are made, consultations are held, and assistance in diagnosis is rendered. This department further organizes, develops, and carries on educational programs for the control and eradication of diseases. Quarantine measures are employed to prevent, as far as possible, the introduction or spread of livestock diseases into this state.

The Clemson Livestock Laboratory, a fully equipped modern laboratory staffed with highly trained personnel, is maintained 14 miles northeast of Columbia on U. S. Highway No. 1, at the site of the Sandhill Experiment Station. This laboratory is prepared to assist veterinarians and owners of livestock and poultry in making
post-mortem laboratory examinations and bacteriological and pathological studies to aid in the diagnosis of diseases. If necessary, sufficient equipment can be sent into the field to diagnose and control disease on the spot.

The administrative office is located in the above building. Adequate records and identification of livestock are kept. A staff of veterinarians works from the Columbia office, and field veterinarians are located in various sections of the State. In addition to the regular field force of veterinarians directly connected with the Columbia office, practicing veterinarians are commissioned as State-Federal Accredited Veterinarians and assist in the eradication of infectious diseases of livestock. At present there are 133 veterinarians so commissioned and their locations are such that the Clemson University Livestock-Poultry Health Department is in a position to control and eradicate disease promptly and completely in all sections of the State.

This department is required by legislative enactment and supported by legislative appropriation.

THE SOUTH CAROLINA STATE CROP PEST COMMISSION

The act creating the State Crop Pest Commission was passed by the legislature in 1912. According to the act, five members of the Board of Trustees of Clemson University shall compose the Commission.

The purpose of the Commission is to prevent, as far as possible, the introduction into South Carolina of injurious plant pests and to limit the spread of those already within the State. The Commission is also charged with the enforcement of the Bee Disease Act and the South Carolina Economic Poison Law.

The work is performed by the promulgation and enforcement of certain rules and regulations which in the judgment of the Commission are necessary to protect the agricultural interest of South Carolina. The enforcement of the regulations is the responsibility of the State Entomologist, State Plant Pathologist, and their agents.

THE ENGINEERING EXPERIMENT STATION

The Engineering Experiment Station of Clemson University was established by the Board of Trustees in July 1924. Its purpose is to coordinate and stimulate the research activities in the College of Engineering. These activities include the contribution of new knowledge in engineering science by prosecuting a vigorous pro-
gram of basic research, the conduct of programs of developmental and applied research as a service to the industries of the State, and the determination of uses for the material resources of the State and thereby to encourage the growth of new industries.

The active research staff consists essentially of the faculty members of the College of Engineering and other divisions of the University. The laboratories of all departments, as well as other special purpose space, are available to the Station in its investigations.

Research is the foundation for progress in a technological society. The well-equipped physical facilities and the thoroughly competent professional staff available to the Station constitute extremely valuable resources for continuing and expanding this research effort.

**TEACHER EDUCATION**

*Agricultural Education.* The members of the staff of Agricultural Education visit all beginning teachers for the purpose of assisting them on the job and also for the purpose of collecting information which may prove helpful in improving the work of teacher education at the University. In addition, conferences of teachers are held and consulting services made available in the interest of the professional growth of agricultural teachers, the rendering of service to agricultural communities, and the development of leadership among agricultural youth through the program of the Future Farmers of America.

Information concerning any phase of the in-service education activities in Agricultural Education may be secured by contacting the Head, Department of Agricultural Education, Clemson University.

*Trades and Industrial Education.* The University, in cooperation with the State Department of Education, is glad to assist those who teach vocational subjects in day trade schools and evening trade and industrial classes by supplying a trained man to assist in the work of organizing classes, organizing courses of study, making plans for teaching evening classes, and actually teaching vocational subjects. Requests for information regarding this service should be addressed to Mr. L. R. Booker, State Teacher Trainer in Industrial Education, Clemson, South Carolina.

**SHORT COURSES AND CONFERENCES**

The facilities of the University are made available for special meetings, such as farm groups, rural ministers, religious organizations, and scientific societies; and arrangements are made for special
short courses in poultry science, beekeeping, food preservation, cotton classing, dairy science, forestry, water supply and sanitation, ornamental nurseries, etc. Such activities, undertaken in the interest of the general welfare, are encouraged by the University.

CERAMIC ENGINEERING FORUM

The Ceramic Engineering Department, in cooperation with North Carolina State of the University of North Carolina at Raleigh, sponsors an annual Ceramic Engineering Forum for Ceramic Manufacturers of the Southeast. The meeting place alternates between Clemson University and North Carolina State. This meeting is intended to provide the latest scientific and engineering developments pertinent to Ceramic Manufacturers and to provide a forum for the stimulation of creative thinking.
GRADUATES OF 1964

BACHELORS' DEGREES CONFERRED JANUARY 25, 1964

SCHOOL OF AGRICULTURE

BACHELOR OF SCIENCE DEGREE

Agricultural Economics
Norman Otha Cox, Loris

Agricultural Education
James Keith Blanton .......... Nichols
Olin Brooks Coskrey .......... Summerton
John Philip Farmer, Jr. ....... Florence
Larry Douglas Hayes .......... Green Sea

James Griffin Miller .......... St. Matthews
Enoch Pendleton Rogers .......... Fork
Charles Darwin Sparks .......... Gaffney
William Henry Weaver .......... Pamplico

Agronomy
Amon Boyd Graves, Jr. .......... Adams, Tenn.

Animal Science
Tom Joe Collins .......... Pickens
William Tindall Howell .......... Rufin

Melville Galletly Padgett .......... Williams
Merritt Ivan Pike .......... Spartanburg

Biology
William Thomas Carter, Ocean Drive Beach

Jack Arlyn Seawright .......... Ware Shoals
James Lee Trautner, Bismarck, N. D.

Dairy Science
Julian Charles Bradham .......... Sumter
Robert Wallace Fraley .......... Florence

Laurence Andrew Gause .......... St. Stephen
Cedric Lee Thomas .......... Johnston

Forestry
Edward Godfrey Oswald, Allendale

Horticulture
William Elmer Huggins .......... Johnsonville

James Carroll Kemp, Jr. .......... Columbia

Poultry Science
Furman Maurice Gregory, Jr., Union

SCHOOL OF ARCHITECTURE

BACHELOR OF ARCHITECTURE DEGREE

Michael Jerome Brannon .......... Cowpens
John Walton Cooper .......... Newberry
Andrew Dale Gilliland .......... Kings Mtn., N. C.

Charles DeChant Grant .......... Greenville
Ronald Edward Kirby .......... Union
Thomas Jerry Lominack .......... Greer

SCHOOL OF ARTS AND SCIENCES

BACHELOR OF ARTS DEGREE

Harold David Anderson .......... Conway
John Dexter Jones .......... Ware Shoals
Melvin Lindsay Kelly, Jr. .......... York

Sara McGee McGill .......... Starr
Francis Wilson Perkins .......... Elloree
Virgil William Rhodes .......... Anderson

BACHELOR OF SCIENCE DEGREE

Applied Mathematics
Thomas Gordon Anderson, Jr., N. Charleston

Robert Grover Little, Jr. .......... Charleston

Archie Swift Livingston, North

* With honor.
† With high honor.

[ 302 ]
Arts and Sciences
Lucas Sanford Delk, Mo. Mooresville, N.C. William Patrick Donnelly, IV, Greenville
Curtis Shelton Lackey, Central, Greenville
Don Cleo Moon, Greenville
Charles Joseph Narvin, West Mifflin, Pa.
Maxwell Farmer Parrott, Jr., Spartanburg
William Wales Saitta, Jr., St. Petersburg, Fla.
David Anderson Strickland
Robert Balfour Trodgon, Jr., Spartanburg
James Attaway Wyatt, Easley

Education
Robert Thomas Bonnett, Hillsdale, N. J.
Manning Nicholas Lomax, Abbeville
William Bard Miller, III, Warren, Ohio

Physics
William Joel Meggs,† Florence

SCHOOL OF ENGINEERING

BACHELOR OF SCIENCE DEGREE

Ceramic Engineering
Adonis Norman Avinger, III, Orangeburg
James Patrick Pearce, Dillon

Civil Engineering
Johnny Ray Allred †, Sanford, Fla.
Charles Pauliete Beaman, Asheville, N. C.
Walter Autry Dotherow, Inman
Hugh Burns Edmonds, Jr., Anderson
James Banton Truitt, Jr., Marietta, Ga.

Electrical Engineering
Robert Charles Dobbins, Cliffside, N. C.
John Richard Dyar, Abbeville
Leonard Ira LoFlin, Salisbury, N. C.

Industrial Education
Algie Russell Campbell, Jr., Spartanburg
Labon Chappell Jones, Clemson

Industrial Engineering
Victor Floyd Burrell, Whitmire
Robert Brownell Greenman, Jr., Crane, Ind.
Alan Louis Habig, Summit, N. J.

Mechanical Engineering
Richard Levon Dryman, Franklin, N. C.
Nathaniel Wilson Dunlap, Anderson
Tatum Wannamaker Gressette, Jr., Columbia
Larry Burns Kincaid, Charleston

SCHOOL OF INDUSTRIAL MANAGEMENT AND TEXTILE SCIENCE

BACHELOR OF SCIENCE DEGREE

Industrial Management
Robert Carson Bell, Avondale Estates, Ga.
Nathan Joel Derrick, Columbia
Dennis Oliver Hofp, Bethel Park, Pa.
Robert Clark Hubbard, III, Union
Hector McLean, Jr., Bennettsville
Edmond Virgil Marlowe, Jr., Conway
William Spencer Yon, Loris

Textile Chemistry
Forrest Fulton Dixon, Jr., Greer

* With honor.
† With highest honor.
Textile Management

William Ernest Barrineau, Jr. ... Cades
Walter Elliott Berry ... ... Greenville
Samuel Wilmer Ford ... ... Warrentine
Nathan Dearborn Harriman ... West Suffield, Conn.
Raymond Holt Lee ... ... Anderson
Harley Sherrill LeMaster ... ... Union

Aubrey Lynn Livingston ... ... Columbia
Harold Leroy Merck ... ... Central
Gerald Wilson Metts ... ... Belvedere
James Thomas Robinson ... ... Easley
Richard Ward Rutland ... ... Fairfax
Joseph Edgar Sherman, Jr. ... ... Clemson
Donald Fletcher Shirley ... ... Cateechee

Textile Science

William Jerry Estridge ... ... Kershaw

William Earle Henderson, Jr. ... ... Greenville

MASTERS’ DEGREES CONFERRED JANUARY 25, 1964

SCHOOL OF AGRICULTURE

MASTER OF SCIENCE DEGREE

Agricultural Economics
Robert Tom Hinsch, Garden City, N. Y.

Agricultural Education
Larry Russell Edwards, Landrum

Agronomy
Donald Richard Gowen, Inman

Entomology
Jakie Alexander Hair, Williston

Horticulture
James Bruce Aitken ... Winter Garden, Fla.

Henry Shaw Bussey ... ... Clemson

Jeff Walter Daniell, Cadwell, Ga.

Plant Pathology
Claude Earl Thomas, Spartanburg

SCHOOL OF ARTS AND SCIENCES

MASTER OF SCIENCE DEGREE

Chemistry
Edwin Platt Hall ... ... Alexandria, Va.

Sammy Carrol Honeycutt, Tuckasegee, N. C.

Education
William Richard Mattox, Clemson

Mathematics
Charles Gilbert Vaughan, Jr., Halifax, N. C.

SCHOOL OF ENGINEERING

MASTER OF SCIENCE DEGREE

Chemical Engineering
Jerry Allan Caskey ... ... Nevada, Ohio

William Harris Conner, Jr. ... Timmonsville

Samuel John Kasley, Clemson

* With honor.
Civil Engineering
William Henry Rice, Jr., Greenville

Electrical Engineering
Charles Kent Ham, Florence

Mechanical Engineering
Michael Eugene Hilley, Greenwood
Joseph Berling Walkup, Jr., Sandy Springs
William Gibson Wilson, Clemson

SCHOOL OF INDUSTRIAL MANAGEMENT AND TEXTILE SCIENCE

MASTER OF SCIENCE DEGREE

Industrial Management
Roy Allison Dalton, Pickens

Textile Chemistry
Russell Turner Gilliam, Great Falls

DOCTORS' DEGREES CONFERRED JANUARY 25, 1964

SCHOOL OF AGRICULTURE

DOCTOR OF PHILOSOPHY DEGREE

Plant Pathology
Robert Hardin Littrell, Clemson

SCHOOL OF ARTS AND SCIENCES

DOCTOR OF PHILOSOPHY DEGREE

Chemistry
Lawrence Edward Browder, III, Andrews
Bobby Gene Stephens, Glendale

BACHELORS' DEGREES CONFERRED MAY 30, 1964

SCHOOL OF AGRICULTURE

BACHELOR OF SCIENCE DEGREE

Agricultural Economics
Alpheus Victor Bethea, III, Latta
Ralph Carl Galloway, Jr., Easley
Richard Allen Suggs, Gastonia, N. C.

Agricultural Education
Stanley Holmes Keaton, Abbeville
Byard Stone, Jr., Johnsonville
Hubert Boyd Waldrop, Inman
Luther Waters, Jr., Batesburg

Agronomy
William Pluss Brown, Laurens
Jimmy Maxwell Carter, Ruffin
John Stanley Case, Walterboro

James Howell Palmer, Anderson
Thomas Hayes Coward, Aiken
William Byerly Wilhelm, Hartsville

* With honor,
Animal Science
James David Heselbarth...Pittsburgh, Pa. Sidney Wood Kennedy...Pendleton
Francis Tillman Mathias, III, Lexington

Biology
Kenneth Eugene Clary...Gaffney Byron Blasdel Harler, Jr...Sumter
Valdimer Sanders Dyche, Jr...Elloree Herman Brown Jackson, Jr...N. Charleston
William Edwin Gore, Jr...Columbia Rodney Reyburn James...Lakeland, Fla.
Mitchell Burdette Smith, Chesterfield

Dairy Science
Joseph William Barnett...Clemson Walton Mays Cooper...North Augusta
William Edward Coble, Jr...Simpsonville Jon Martin Rogers...Piedmont

Entomology
Willard Leroy Smaak, Yongs Island

Forestry
James Thomas Adams, Jr...Clover Knowlton William Johnson...Chesterfield
William Larry Barr...Greenville William Webster Miller...Columbia
John Palmer Britton...Sumter James Barnett Potts, Jr...Rock Hill
Paul Joseph Hagelston, Jr...Aiken John Greene Shuler, Jr...Santee
Joe Kenneth Hill...Moncks Corner David Philip Tarbox...Clemson
George Ford Hunter Gallatin, Tenn. Frank Everett Taylor, Jr...Aiken
Robert David Walden, Johns Island

Horticulture
Richard Evans Cooper*...Clemson Edward Lee Ingle...Horse Shoe, N.C.
Jack Hunt Cornelius Homestead, Fla. Marion LeRon Robbins...Inman
James Thomas Garrett*, Waynesville, N.C. James Calvin Suber...Jackson
William Wesley Gunnin...Pendleton Bruce Edward Tyson...Poughkeepsie, N.Y.
Frank James Howard, Jr.*...Clemson Harry Richard Vaught...Conway

Poultry Science
Edwin Wayne Long, Shelby, N.C.

SCHOOL OF ARCHITECTURE

BACHELOR OF ARCHITECTURE DEGREE
John Anderson Armistead...Easley James Francis Kortan*...Greenwood
James Donaldson Miller, Greenville

SCHOOL OF ARTS AND SCIENCES

BACHELOR OF ARTS DEGREE
Thomas Marion Beale...Florence James Thomas McConnell*...Miami, Fla.
Peggy Elizabeth Bowen...Westminster Bernard Francis Masters...Charleston
Sally Anne Trigg Brock*...Seneca Michael DuPre Medlock...Clemson
Charles Burnis Bryan, Jr...Johns Island Naney Edwards Newman*...Clemson
Lewis Paul Coffey...Blowing Rock, N.C. William Frederick Olive, Searington, N.Y.
Ernest Clarendon Coskrey, Jr., Syracuse, N.Y. William Joel Patterson, III...Greenville
Clarence Oscar Dixon, III...Mullins Margaret Hass Quattlebaum...Charleston
Sara Fort Ferguson Great Falls James Allen Rollison...Greenwood
Richard Clothaire Graves Lancaster Allen Manford Sale, Jr...Aiken
William Millard Leaptrott Ponte Vedra Beach, Fla. Timothy Warren Scully...Greenville

BACHELOR OF SCIENCE DEGREE

Applied Mathematics
David Randolph Floyd*...Lake City James Thomas McConnell*...Miami, Fla.
Frank Lewis Gentry*...Clemson Bernard Francis Masters...Charleston
Green Hamel Giebner, Jr...Greenville Michael DuPre Medlock...Clemson
Paul Diedrich Schumacher, Jr...Thomaston, Ga.

* With honor.
† With high honor.
Arts and Sciences

Gregory Edward Bolton Conway    William Clyde Hubbard Aiken
Glen Edward Bouknight Rock Hill    Wayne Talbert Kennedy Manning
Frederick Colclough Byrd Ridge Spring    William Dee Kirby St. George
Charlie Edward Cleaninger, Jr. Columbia    Jackie Wayne Knight St. George
James Stanton Cross, Jr. Conway    Charles Benjamin Marsella Kingstree
Michael Francis Dawes Greenville    Nicholas Milasovich Youngstown, Ohio
David Alvin Estes Abbeville    Frank Ronald Roskovich Belle Vernon, Pa.
Vivian Judson Farmer Florence    William Harrison Shirley, Jr. Ninety Six
Walter Clark Casky Greenville    William Henry Stover, IV St. Petersburgh Beach, Fla.
Joseph Linwood Holmes Conway    Frank Winesett, Dillon

Chemistry

Henry Daniel Caughman Ware Shoals    John Wulbern Miley Charleston
Chester Wright Jenkins North Augusta    Jerome Wallace Nix Catechee
Edward Michael McKee Charleston    Harry Ballenger Poole Newberry
Alfred Thomas Merritt, Valley Stream, N. Y.    Diane Ellen Vaughn Baltimore, Md.

Education

Michael Bohonak, Jr., Pittsburgh, Pa.

Physics

Raymond Ashby Ayers Orangeburg    Harry Hammond Suber Jackson
John David Fowler, Jr. Bennettsville    George McGregor Webb Clemson
Heyward Cassidy Hawkins Hartsville    Robert Earl Wiley Abbeville
Michael Myers Holland Florence    John Thomas Wood Tigerville

Pre-Medicine

David Austin Bradham Sumter    Duane Scott Moore Seneca
Robert Osborne Brown, Jr. Richburg    James Ernest Reinhardt, Jr. Edgemoor
William Harold Burdette Seneca    Jerry Jordan Sample Ridge Spring
Rodman Lemon, Jr. Barnwell    James David Smith Anderson
Jimmy Alan Lyons Orangeburg    Billy Ray Salesbee Greer
Archie Basil Ward, Kingstree

SCHOOL OF ENGINEERING

BACHELOR OF SCIENCE DEGREE

Agricultural Engineering

(Agricultural Engineering is jointly administered by the School of Agriculture and the School of Engineering)

Joseph Everette Brown Kingstree    John Derrick Joyce Lamar
Jeffery Darlington Dent West Hyattsville, Md.    Frank Cannon Patten Timmonsville
Francis Joel Hanks Honea Path    William Warner Patton Haines City, Fla.

Ceramic Engineering

William Mulcahy Caswell Montclair, N. J.    David Wasson Moorhead Laurens
Cary Arthur Counts Mullins    Larry Edward Myers Ashland, Ohio
Alva Reese Cox Marion    Harold Bacot Newman Salisbury, N. C.
Frank Young Duncan, Jr. Sharon    Richard Alexander Pregnall Columbia
Frontis Thomas Frick Newberry    Benjamin Pruitt Reese, II Union

Chemical Engineering

Carl Lawson Batton North Charleston    George Nicholas Houth, Jr., Cranston, R. I.
Robert Brown Charleston    James Carroll Howard Greer
James Hal Cummins, Jr. Whitehaven, Tenn.    Gregory Kemp Hughes Clemson
James Edward Davis, Jr. Chester    Daniel Harrington Hunt Greenville
Malcolm Everett Davis Norway    North Augusta
Elias Preston Earle Greensboro, N. C.    Enoch Henry Hurst Charleston
John Robert Fogle, III Anderson    James Robert Jones Clemson
Phil Charmelle Greeson Greenwood    Thomas Frederick Kicklighter, Jr. Charleston Heights

* With honor.
† With highest honor.
‡ With high honor.
Civil Engineering

Douglas Holmes Burgess* ............... Cleveland
Fulton Vandiver Clinkscale, Jr. ........ Greenville
James Dennis Crocker .................... Pacolet
William Jerrald Dempsey† .............. Taylors
Thomas Madison DeYoung .............. Clinton
Robert Edward Dye ....................... Anderson
Leonardo Guarderas ........... Guayaquil, Ecuador
Jerry Michael Hart ..................... Walhalla
Leonard John Hasty, Jr. ............... Camden
George Ronald Wertz,° Kershaw

Electrical Engineering

Robert Plowden Abbott† .................. Sumter
James Allan ............................... Summerville
Roy Arthur Arnold ....................... Greenville
Robert Louis Breeden† ................... Bennettsville
Tommy Lee Bridges ....................... Greenville
Joseph Anthony Celecius ................ Norwich, Conn.
Douglas Remain Cobb† ................... Anderson
John Barry Coleman ...................... Waterloo
Harry Edward Crisp, II ................... Fredericksburg, Va.
Robert Earl Dadin* ...................... Charleston
Charles Ambrose Delhart ................ Anderson
Earl Steven Faris ......................... Clover
Roger Mark Hall ......................... Abbeville
Robert Eldredge Hilton, Jr. .......... Winnisboro
George Winfield Horres, Jr. .......... Charleston
Luther Lee Joyner, III ................. Sumter
Rees Hawkins Kimble ................... Sumter
Larry Allen McKinney ................... Greenville
Daniel Edwin McMah,. .................. Belton
Richard James Morris* .................. Columbia
Edward Eugene Nelson ................... Ninety Six
Oscar Dewey Parsons, Jr. .............. Rock Hill
Roger Harris Phillips ................... Charleston Heights
Thomas Alexander Ramsay .............. Simpsonville
Richard Withlow Rasmussen, Hillside, N. J.
James Edward Rickenbacker* .......... Cameron
William August Sander, III† .......... Charleston
Thomas Eugene Smith .................... Anderson
Michael Robert Vehorn° .................. Gaffney
John Thomas Welsh, III ° .......... Lancaster
Starr

Industrial Education

Byron Verner Burkett, Jr. ............... Seneca
Reese Preston Herron, Jr. ............. Starr
Larry Herbert Sherrer, Columbia

Industrial Engineering

Neal Byron Kightlinger .................. Columbia
Hugh Darby Martin ...................... Union
Charles Harold Morrow, Jr. .......... Landrum
John Caldwell Walker, Whitmire

Mechanical Engineering

Richard Earle Batton ..................... North Charleston
Clarence Bond Beaudrot† .............. Greenwood
Cletus Mitchell Bess ..................... Pageland
Edward Hutchinson Byers, Mt. Holly, N. C.
William Alfred Cannon ................ Hartsville
Douglas Owen Cullen† ................. Kensington, Md.
Paul Feinstein, Jr. ..................... Spartanburg
Anthony Gerard Gaeta ................... Livingston, N. J.
Robert Glenn Garrison, Jr. .......... Chester
Robert Earle Goins ..................... Charlotte, N. C.
Richard Stilton Hagins† ............... Lancaster
James Roger Head ......................... Lancaster
Elbert O'Neal Hooker° .................. Robbins, N. C.
William Brownlow Jackson .............. Greenville
Henry Carlisle Iovers, Jr. .......... Salisbury, N. C.

Larry Douglas Reeves ................. Anderson
Dexter Milton Russell .................. Charlotte, N. C.
John Michael Smart ..................... Taylors
Jack Antley Smoke ...................... St. Matthews
Edward Harold Sutter, Jr. .......... Atlanta, Ga.
Andrew Rutledge Trenholm .......... Charleston

James Marcus Kelly, Jr. ............... Spartanburg
Ronald Allen Lanier ................... Savannah, Ga.
Randall Clayton Miller ............... Savannah, Ga.
John Stephen Olson ..................... Decatur, Ga.
Ronald Mervyn Poston .................. Pamplico
Herbert David Rosamond† .............. Greenville
Thomas Droman Sherbert, Jr. ........ Union
James Carroll Tindall ................. Spartanburg
Neil Glenn Towery ................. Sumter

Charles Dale Hunter† ................. Cartersville, Ga.
Clements
Larry Allen McKinney .................. Greenville
Daniel Edwin McMah,.................. Belton
Richard James Morris* .................. Columbia
Edward Eugene Nelson ................... Ninety Six
Oscar Dewey Parsons, Jr. .............. Rock Hill
Roger Harris Phillips ................... Charleston Heights
Thomas Alexander Ramsay .............. Simpsonville
Richard Withlow Rasmussen, Hillside, N. J.
James Edward Rickenbacker* .......... Cameron
William August Sander, III† .......... Charleston
Thomas Eugene Smith .................... Anderson
Michael Robert Vehorn° .................. Gaffney
John Thomas Welsh, III ° .......... Lancaster

Byron Verner Burkett, Jr. ............... Seneca
Reese Preston Herron, Jr. ............. Starr
Larry Herbert Sherrer, Columbia

Charles Harold Morrow, Jr. .......... Landrum
Curtis Lavoy Roberts .................. Lancaster
John Caldwell Walker, Whitmire

Alan Johnson Lenning .......... Greenwood
David Alexander Mauney .............. Atlanta, Ga.
Richard Andrew Maxwell .......... Greenville
William Harry Moody ..................... Spartanburg
Marshall Liston Morris, Jr. .......... Pinewood
William Frank Oakley .................. Decatur, Ala.
Bruce Sheldon Patterson° .......... Burton
George Edward Peeler, Jr. ............ Charleston
David Miller Rucker ..................... North Augusta
George Timothy Sidrny ................. Metuchen, N. J.
Baxter George Simpson, Jr. .......... Rock Hill
Douglas Virgil Smith° ................. Spartanburg
Aubrey Lorantz Swofford ............... Laurens
Bruce Jackson Taylor ................. Greenville
James Austin Wingate, Jr.° .......... Rock Hill

* With honor.
† With high honor.
‡ With highest honor.
SCHOOL OF INDUSTRIAL MANAGEMENT AND TEXTILE SCIENCE

Bachelor of Science Degree

Industrial Management

Robert Marvin Ballentine, Jr. ........ Easley
Wayde Ronald Barrett ............ Westminster
Joseph Connie Bowers ............. Pickens
John Clinton Caban ............... Spartanburg
William Paul Clement, Jr......... Spartanburg
Jackie Leon Collins ............... Blacksburg
Walter Thompson Cox, III......... Clemson
Frederick Castella Craft, Jr. ....... Seneca
Alexander Berry Credle, Jr.—Foughkeepsie, N. Y.

Charles Edward Dalton ............ Pickens
Fred Gerrard Dobbins, Jr. ......... Townville
George Ellis Dorman .............. Fairest
Daniel Radcliffe Folendore ........ Timmonsville
Thomas Hartwell Goodson, Jr. ...... Hartsville
Ben Charles Harrison ............. Roebuck
Sidney Lanier Houser .............. Orangeburg
Malcolm Craig Hughes .............. Gastonia, N. C.
Michael Kern Johnson ............. Clemson
William Charles Lawrence, Jr. .... Spartanburg

Textile Chemistry

Spencer Bernard Bates, Deerfield Beach, Fla.

Larry Greene Howard, Greer

Textile Management

Guy Edward Ballard, III ........... Columbia
Jerry Wayne Blackwood .......... Gaffney
Harry Edward Blakeney .......... Kershaw
Claude Donald Burriss .......... Abbeville
Lewis Milton Cyburn, Jr............. Kershaw
William Tyndall Davidson, III—Avondale, N. C.

Charles Ervin Fousek ............. Townville
Charles Anthony Grant ............ Spartanburg
Claudius Charles Hefner .......... Pendleton
Robert Davis Hurley .............. Spartanburg

Textile Science

Charles Douglas Barton .......... Greenville
Jasper Thomas James, III ......... Sumter

William Thomas Pack ............ Inman
William Allen Suttle ............. Great Falls

Masters' Degrees Conferred May 30, 1964

School of Agriculture

Master of Science Degree

Agricultural Economics

Billy Dee Cook ........ Bowlung Green, Ky.
Charles Wayne Hefner .......... Pendleton

James Oliver Frye ........ Cary, N. C.

Agronomy


Animal Science

John Frederick Wise, Clemson

* With honor.
Bacteriology
Larry Edwin Vereen, Ocean Drive Beach

Dairy Science
Daniel Dixon Lee, Jr., Clemson

Horticulture
Wilton Pierce Cook .................. Woodruff    Landon Carl Miller .................. Clemson
Danny Odell Ezell .................. Chesnee    Marv Dean Moore  .................. Hemingway

Plant Pathology
Melvyn Lazelle Ottinger, Newport, Tenn.

Poultry Science
Mary Corinne Hammond .............. Liberty    John Finlay Welter .................. Clemson

SCHOOL OF ARTS AND SCIENCES

MASTER OF SCIENCE DEGREE

Chemistry
Vahe Mardiros Marganian ........... Clemson    James Kirk Sullivan .................. Clemson
Lynn Harvey Wright, Jackson, Miss.

Mathematics
Robert Wayne Kelley .............. Six Mile    Edwin Parker McCravy .............. Easley

Physics
James Emmett Youngblood, Jr., Columbia

MASTER OF ARTS DEGREE
Barbara Ferry Johnson, Clemson

MASTER OF EDUCATION DEGREE
Gail Hemphill Snow .............. Landrum    Sara Jeffries Spear .................. Columbia

SCHOOL OF ENGINEERING

MASTER OF SCIENCE DEGREE

Agricultural Engineering
(Agricultural Engineering is jointly administered by the School of Agriculture and the School of Engineering)
James Madison Allison, Brevard, N. C.

Ceramic Engineering
Charles Haley Coggin, Jr .......... Columbia    Maxwell Keen Spear, Jr.............. Charlotte, N. C.
Kennerly Scott Thornburg, Gastonia, N. C.

Civil Engineering
Lawrence Franklyn Pace, Pickens
James Markwood Wintermyre, Harrisonburg, Va.

Electrical Engineering
Walter Karl Schumacher, Surfside, Fla.

Mechanical Engineering
William Claude Thomas, Edgemoor

Water Resources Engineering
Robert Patrick Jenkins, Mayo
SCHOOL OF INDUSTRIAL MANAGEMENT AND TEXTILE SCIENCE

MASTER OF SCIENCE DEGREE

Industrial Management
Richard Bank Autry, Enid, Okla.

Textile Chemistry
Kermit Stillman LaFleur, Clemson

DOCTORS' DEGREES CONFERRED MAY 30, 1964

SCHOOL OF ARTS AND SCIENCES

DOCTOR OF PHILOSOPHY DEGREE

Chemistry
Raymon Paul Elliott..............Clemson
Thomas McKnight Ellison........Spartanburg
Samuel Plyler McManus, Greer

Physics
William Hogue Stewart, Jr., Nichols

HONORARY DEGREES CONFERRED MAY 30, 1964

DOCTOR OF LAWS

Dennis William Brosnan, Washington, D. C. Donald Stuart Russell..............Columbia
Richard Manning Jefferies, Sr.,§ Walterboro Robert Scott Small.................Greenville

DOCTOR OF LETTERS

Richard Buckminster Fuller, Carbondale, Ill.

EMERITUS TITLES CONFERRED MAY 30, 1964

George Hubert Aull
Head Emeritus of Agricultural Economics and Rural Sociology Department
Professor Emeritus of Agricultural Economics and Rural Sociology
and Agricultural Economist Emeritus

Gaston Gage
Dean of the School of Industrial Management and Textile Science
Head Emeritus of Yarn Manufacturing Department and
Professor Emeritus of Carding and Spinning

Joseph Lindsay, Jr.
Head Emeritus of Textile Chemistry and Dyeing Department and
Professor Emeritus of Textile Chemistry and Dyeing

Macfarland Shackelford
Assistant Professor Emeritus of Physics

§ Posthumous Award.
BACHELORS' DEGREES CONFERRED AUGUST 22, 1964

COLLEGE OF AGRICULTURE AND BIOLOGICAL SCIENCES

BACHELOR OF SCIENCE DEGREE

Agricultural Economics
William Lewis Jones, Easley

Agricultural Education
James Ralph Ballington, Jr., Lexington William Clarence Gunners, Olar
Clinch Heyward Fowler, Jr., Loris Herbert Marshall Nichols, Tamassee
Raymond Earl Robertson, Jr., Laurens

Agronomy
Robert Arthur Bates, William Williston Hugh Brunson Gray, Allendale

Animal Science
Robert Earl Dudley, Galivants Ferry

Biology
Luther Edward Gatlin, III, Newberry Roy Allen Traylor, Jr., Atlanta, Ga.

Dairy Science
James Richard Moeller, Greenwood

Forestry
James Ralph Freeland, Greenwood Joseph Daniel Lamb, Inman
Eddie Lee Hackworth, Jr., Lynchburg, Va. Paul Joseph Oeland, III, Greenville
Eugene Hay Kneece, Jr., Aiken Leonard Pergeous Rogers, Andrews
Albert Luck Shepherd, III, Enoree

Horticulture
Christopher Randall Freeman, Sumter Alton Wilson Keller, Batavia, N. Y.

SCHOOL OF ARCHITECTURE

BACHELOR OF ARCHITECTURE DEGREE

Frederick Marion Ehni, Charleston Dolores May Cope Tilley, Dunedin, Fla.
Michael John Lynn, Scranton, Pa. Weston Covert Wilhelm, Hampton

COLLEGE OF ARTS AND SCIENCES

BACHELOR OF ARTS DEGREE

Sterling Webb Beckman, Columbia Charles Edgar McDonald, Jr., Winnisboro
John Hamilton Cole, Jr., Clemson George Edward Myers, Lynchburg
John Raymond DesJardins, Columbia Harry Pickens Porth, Jr., Columbia
Barbara Jeanne Foote, Greenville James Doyl Puckett, Scuca
Carolyn Folt Halffacre, West Columbia
Alfred Thomas Hind, III, Clemson

BACHELOR OF SCIENCE DEGREE

Applied Mathematics
Richard Leonard Welch,* Rocky River, Ohio

Arts and Sciences
Leon Darvin Flanders, Winnisboro William Tully Murphy, Jr., St. George
Robert Stanley Woodward, Spartanburg

* With honor.
Chemistry
Sanford Woodrow Griffin, Jr. ... Fort Mill
Janet Elizabeth Owens ... ... Walhalla

Doctor of Science

Medical Technology
Sally Haas Hester, Union

Pre-Medicine
James Wesley Childs ... Liberty
Wallis Dicks Conk, Jr. ... Sumter
Calhoun Wirt Cox, Jr. ... Seneca

Ralph Moore ... Gaffney
Bernard Davis Pelizeo, Jr. ... Barnwell
Charles Edward Ricker ... Anderson

COLLEGE OF ENGINEERING

Bachelor of Science Degree

Ceramic Engineering
Edward Lee Collins ... ... Clemson
Rudolph Herman Kizer, Jr., Orangeburg

Civil Engineering
James Herbert Bradley ... Charleston Heights
Charles Donald Carmen, Jr. ... Wilmington, N. C.
Russell Simmons Wolfe, III, Orangeburg

Electrical Engineering
Edward Gene Austin ... ... Startex
Thomas Oscar Curlee, III ... Greenville
John Cecil Howard, Jr. ... Georgetown
Edwin Cater Leland, Jr. ... Saluda, N. C.
Edward Ronald Lybrand ... ... Aiken

Dennis Richard Mangum ... ... Columbia
Larry Edwin Moore ... ... Lockhart
Dimitri Papastathis ... ... Spartanburg
William Franklin Speights, Jr. ... ... Hampton

Industrial Education
James Linwood Ackerman ... St. George
Harry Charles Golderer, Jr. ... Brevard, N. C.
Francis Graham Payne, Mt. Pleasant

Industrial Engineering
Steven Warren Faulkner ... ... Gastonia, N. C.
Martin Frederick Lightsey ... Columbia
David McCarthy Murray, Jr., Charleston

Mechanical Engineering
William Corley Ayres ... Nichols
Oliver Torrence Dowling ... Florence
Larry Keith Seitz ... Morrisonville, Ill.

Carl Frank Simmons ... ... Pickens
William Barber Sykes, Jr. ... Manning
Sterling Wayne Walker ... ... Charleston
Charles Rufus Willingham, Charlotte, N. C.

SCHOOL OF INDUSTRIAL MANAGEMENT AND TEXTILE SCIENCE

Bachelor of Science Degree

Industrial Management
Layton Herndon Adams ... Bamberg
Hibbie Alexander Ayoub, Charleston Heights
Robert Kenneth Boroughs ... Dillon
Joel Martin Burdette, Jr. ... Greenville
Henry Malloy Evans, Jr. ... Belton
Jack Edward Fallaw ... North Augusta
David Willis Coff ... ... Saluda

Albert Harry Luiz ... Spartanburg
Robert Terrell McMichael, Jr. ... Anderson
Woodward Howard Morgan, III ... Hartsville
James Franklin Osley, III ... Hartsville
Jimmy Bert Queen ... ... Gaffney
William Sheldon Simms, Jr. ... Atlanta, Ga.
Henry Bernard Thompson, ... Charlotte, N. C.

Dale Ward Williams, Camden

* With honor.
Textile Chemistry
Douglas Eugene Deal .............. Walhalla  William Karl Hawfield ............. Lancaster
Michael Randolph Prater, Seneca

Textile Management
William Edward Alexander ............ Seneca  James Caldwell Harrison ............. Landrum
Malcolm McFall Bab .............. Anderson  Danny Roy Hilley ............... Calhoun Falls
Jerry Dennis Burton .............. Calhoun Falls  Charles Thomas Kirkley ............ Charleston
Melvyn Dennis Coffman ............. Aiken  James Michael Logan ............ Mooresboro, N. C.
Robert Victor Fritz .............. Asheboro, N. C.  James Francis Martin ............. Johnston
Jesse James Glasgow, Jr. .......... Conway  John Frederick Scarlett ............ Burlington, Ont.
Charles Reed Harper, Jr. .......... Greenwood  James Marshall Womack, Jr. ........ Camden

Textile Science
Gary Ansel Hall, Greenwood

MASTERS’ DEGREES CONFERRED AUGUST 22, 1964

COLLEGE OF AGRICULTURE AND BIOLOGICAL SCIENCES

MASTER OF SCIENCE DEGREE

Agronomy
Robert Eugene Currin, III, Florence

Animal Science
Leon William Davis, Clemson

Dairy Science
Glenn Alden Carmichael ............ Orlando, Fla.  Cecil Douglas Clawson ............. Boone, N. C.

Entomology
Joseph Eugene Bumgarner—Winston-Salem, N. C.  Robert Rhea Nash .............. Central
Stephen Horne Roach ............. Avondale, N. C.

MASTER OF AGRICULTURAL EDUCATION DEGREE

Emory William Brownlee, ........ Blakely, Ga.  Thomas Paul Earle ............. Central
Cecil Heyward Johnson, Jr., Pinewood

COLLEGE OF ARTS AND SCIENCES

MASTER OF SCIENCE DEGREE

Mathematics

Physics
Henry Prentiss Ward, Jr., Georgetown

MASTER OF EDUCATION DEGREE

Anne Cowan Ashbury .............. Clemson  Joseph Calhoun Keaton ............. Anderson
Debbie Dillard Edens .............. Pendleton  Rachel O’Daniel McGrew ............ Camden
Helen Thompson Eiland ............ Clemson  Mary Frances Mealing McKellar, N. Augusta
Clifford Calvin Hayslip ............ Spartanburg  Robert Nandell Moser ............. Ninety Six
Penelope Sue Rochester, Clemson
COLLEGE OF ENGINEERING

MASTER OF SCIENCE DEGREE

Agricultural Engineering
(Agricultural Engineering is jointly administered by the College of Agriculture and Biological Sciences and the College of Engineering)
Robert Elmore Williamson, York

Ceramic Engineering
John Fletcher Smoak, Jr., Summerville

Electrical Engineering
William Raymond Dube, Largo, Fla. Reginald Allen Inman, Whitmire
Sharad Kumar Pathak, Hyderabad, India

Mechanical Engineering
Ting Shu Chen, Kaohsiung, Taiwan

Water Resources Engineering
Joab Mauldin Anderson, Greenwood
Robert William Hotinger, Jr., Columbia
Billy Howard Komegay, Powhatan, Va.

Master of Industrial Education Degree
Homer Wilson Burgess, Toccoa Falls, Ga.

SCHOOL OF INDUSTRIAL MANAGEMENT AND TEXTILE SCIENCE

Master of Science Degree

Industrial Management
Bruce Morris White, Greenville

DOCTOR'S DEGREE CONFERRED AUGUST 22, 1964

COLLEGE OF AGRICULTURE AND BIOLOGICAL SCIENCES

Doctor of Philosophy Degree

Entomology
Raymond Darrell Eikenbary, Yale, Okla.
BACHELORS' DEGREES AWARDED IN 1964 BY MAJOR COURSES

College of Agriculture and Biological Sciences
( Including Double Major ) ........................................ 101°
Agricultural Economics ........................................... 7
Agricultural Education * ........................................... 17
Agronomy ............................................................. 10
Animal Science ....................................................... 8
Biology ...................................................................... 12
Dairy Science ......................................................... 9
Entomology ............................................................ 1
Forestry ..................................................................... 21
Horticulture ............................................................. 14
Poultry Science ......................................................... 2

School of Architecture ................................................ 13
Architecture ................................................................ 13

College of Arts and Sciences ......................................... 134
Applied Mathematics .................................................. 8
Arts and Sciences ....................................................... 83
Chemistry ................................................................ 12
Education ................................................................ 1
Medical Technology ................................................. 1
Physics ....................................................................... 9
Pre-Medicine ............................................................. 17

College of Engineering ( Including Double Major ) .......... 205†
Agricultural Engineering ............................................. 7
Ceramic Engineering .................................................. 15
Chemical Engineering ................................................ 28
Civil Engineering† ...................................................... 36
Electrical Engineering ............................................... 51
Industrial Education .................................................. 8
Industrial Engineering ............................................... 11
Mechanical Engineering ............................................. 40

School of Industrial Management and Textile Science .... 135
Industrial Management ............................................... 70
Textile Chemistry ..................................................... 1
Textile Management ................................................... 50
Textile Science ........................................................ 7

Total Bachelors' Degrees Awarded in 1964 (Excluding Duplicates) . 586

MASTERS' DEGREES AWARDED IN 1964 BY MAJOR COURSES

College of Agriculture and Biological Sciences .......... 31
Agricultural Economics .............................................. 3
Agricultural Education ............................................... 4
Agronomy ................................................................ 3
Animal Science ......................................................... 2
Bacteriology ............................................................ 1
Dairy Science ............................................................ 3
Entomology .............................................................. 4
Horticulture ............................................................. 7
Plant Pathology ........................................................ 2
Poultry Science ........................................................ 2

° Includes one student who formerly graduated in Agronomy.
† Includes one student who formerly graduated in Agricultural Engineering.
COLLEGE OF ARTS AND SCIENCES .......................................................... 25
  Chemistry ................................................. 5
  Education ............................................. 12
  English ............................................... 1
  Mathematics ......................................... 5
  Physics ................................................ 2

COLLEGE OF ENGINEERING ............................................................... 31
  Agricultural Engineering ......................... 2
  Ceramic Engineering ............................... 4
  Chemical Engineering ............................ 3
  Civil Engineering .................................... 3
  Electrical Engineering ............................ 5
  Industrial Education ............................... 2
  Mechanical Engineering ........................... 5
  Water Resources Engineering .................... 7

SCHOOL OF INDUSTRIAL MANAGEMENT AND TEXTILE SCIENCE ............... 5
  Industrial Management ............................ 3
  Textile Chemistry ................................... 2

Total Masters’ Degrees Awarded in 1964 ............................................. 92

DOCTORS’ DEGREES AWARDED IN 1964 BY MAJOR COURSES

COLLEGE OF AGRICULTURE AND BIOLOGICAL SCIENCES ....................... 3
  Agronomy ............................................. 1
  Entomology .......................................... 1
  Plant Pathology ..................................... 1

COLLEGE OF ARTS AND SCIENCES ..................................................... 5
  Chemistry ............................................. 5

Total Doctors’ Degrees Awarded in 1964 ............................................ 8

Total Number Degrees Awarded in 1964 (Excluding Duplicates) ............... 686

TOTAL DEGREES AWARDED BY MAJOR COURSES, 1896-1964

Bachelors’
  Major Course
  Agriculture ............................................ 244
  Agriculture and Animal Industry ................. 80
  Agriculture and Chemistry ........................ 69
  Agricultural Chemistry ............................ 102
  Agricultural Economics ............................ 281
  Agricultural Education ............................ 352
  Agricultural Engineering .......................... 449
  Agronomy ............................................. 728
  Animal Science ...................................... 736
  Applied Mathematics ................................ 25
  Architectural Engineering ........................ 118
  Architecture ......................................... 486
  Arts and Sciences .................................... 750
  Bachelor of Science ................................ 3
  Biology ............................................... 27
  Botany ................................................ 12
  Ceramic Engineering .................................. 154
  Chemical Engineering ............................. 264
  Chemistry ............................................ 350
### Major Course

<table>
<thead>
<tr>
<th>Course</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry and Geology</td>
<td>11</td>
</tr>
<tr>
<td>Chemistry-Engineering</td>
<td>43</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>1,191</td>
</tr>
<tr>
<td>Dairy Science</td>
<td>369</td>
</tr>
<tr>
<td>Education</td>
<td>240</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>1,516</td>
</tr>
<tr>
<td>Engineering Industrial Education</td>
<td>70</td>
</tr>
<tr>
<td>Entomology</td>
<td>159</td>
</tr>
<tr>
<td>Forestry</td>
<td>111</td>
</tr>
<tr>
<td>General Science</td>
<td>359</td>
</tr>
<tr>
<td>Horticulture</td>
<td>434</td>
</tr>
<tr>
<td>Industrial Education</td>
<td>291</td>
</tr>
<tr>
<td>Industrial Engineering</td>
<td>84</td>
</tr>
<tr>
<td>Industrial Management</td>
<td>577</td>
</tr>
<tr>
<td>Industrial Physics</td>
<td>56</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>1,310</td>
</tr>
<tr>
<td>Mechanical and Electrical Engineering</td>
<td>489</td>
</tr>
<tr>
<td>Medical Technology</td>
<td>1</td>
</tr>
<tr>
<td>Physics</td>
<td>51</td>
</tr>
<tr>
<td>Poultry Science</td>
<td>33</td>
</tr>
<tr>
<td>Pre-Medicine</td>
<td>290</td>
</tr>
<tr>
<td>Soils</td>
<td>9</td>
</tr>
<tr>
<td>Textile Chemistry</td>
<td>294</td>
</tr>
<tr>
<td>Textile Engineering</td>
<td>1,060</td>
</tr>
<tr>
<td>Textile Industrial Education</td>
<td>85</td>
</tr>
<tr>
<td>Textile Management</td>
<td>170</td>
</tr>
<tr>
<td>Textile Manufacturing</td>
<td>1,045</td>
</tr>
<tr>
<td>Textile Science</td>
<td>22</td>
</tr>
<tr>
<td>Veterinary Science</td>
<td>16</td>
</tr>
<tr>
<td>Vocational Agricultural Education</td>
<td>729</td>
</tr>
<tr>
<td>Weaving and Designing</td>
<td>42</td>
</tr>
</tbody>
</table>

### Double Majors

<table>
<thead>
<tr>
<th>Majors</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Chemistry and Arts and Sciences</td>
<td>1</td>
</tr>
<tr>
<td>Agricultural Chemistry and General Science</td>
<td>1</td>
</tr>
<tr>
<td>Agricultural Economics and Animal Husbandry</td>
<td>1</td>
</tr>
<tr>
<td>Agricultural Economics and Vocational Agricultural Education</td>
<td>1</td>
</tr>
<tr>
<td>Agricultural Engineering and Civil Engineering</td>
<td>2</td>
</tr>
<tr>
<td>Agricultural Engineering and Electrical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Agricultural Engineering and Mechanical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Agronomy and Agricultural Education</td>
<td>1</td>
</tr>
<tr>
<td>Agronomy and Vocational Agricultural Education</td>
<td>4</td>
</tr>
<tr>
<td>Animal Husbandry and Industrial Management</td>
<td>1</td>
</tr>
<tr>
<td>Animal Husbandry and Vocational Agricultural Education</td>
<td>5</td>
</tr>
<tr>
<td>Animal Husbandry and Agricultural Education</td>
<td>3</td>
</tr>
<tr>
<td>Animal Husbandry and Ceramic Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Animal Husbandry and Dairy</td>
<td>2</td>
</tr>
<tr>
<td>Architectural Engineering and Architecture, five-year</td>
<td>1</td>
</tr>
<tr>
<td>Architecture and Architectural Engineering</td>
<td>11</td>
</tr>
<tr>
<td>Architecture and Civil Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Architecture, four-year, and Architecture, five-year</td>
<td>18</td>
</tr>
<tr>
<td>Architecture, four-year, and Mechanical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Arts and Sciences and Agricultural Economics</td>
<td>1</td>
</tr>
<tr>
<td>Chemical Engineering and Chemistry and Chemistry-Engineering</td>
<td>3</td>
</tr>
<tr>
<td>Chemical Engineering and Chemistry-Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Chemistry and Chemical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Chemistry and Chemistry-Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Chemistry and General Science</td>
<td>1</td>
</tr>
<tr>
<td>Chemistry and Industrial Physics</td>
<td>1</td>
</tr>
<tr>
<td>Chemistry and Agricultural Chemistry</td>
<td>1</td>
</tr>
<tr>
<td>Civil Engineering and Chemistry and Geology</td>
<td>2</td>
</tr>
</tbody>
</table>
### Major Course

<table>
<thead>
<tr>
<th>Course</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Engineering and Industrial Physics</td>
<td>1</td>
</tr>
<tr>
<td>Civil Engineering and Electrical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Civil Engineering and Mechanical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Electrical Engineering and Applied Mathematics</td>
<td>1</td>
</tr>
<tr>
<td>Electrical Engineering and Industrial Physics</td>
<td>1</td>
</tr>
<tr>
<td>Electrical Engineering and Mechanical Engineering</td>
<td>17</td>
</tr>
<tr>
<td>Electrical Engineering and Textile Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Entomology and Architecture, five-year</td>
<td>1</td>
</tr>
<tr>
<td>Entomology and Pre-Medicine</td>
<td>1</td>
</tr>
<tr>
<td>General Science and Ceramic Engineering</td>
<td>1</td>
</tr>
<tr>
<td>General Science and Education</td>
<td>1</td>
</tr>
<tr>
<td>General Science and Electrical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Horticulture and Agronomy</td>
<td>1</td>
</tr>
<tr>
<td>Horticulture and Architectural Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Horticulture and Civil Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Industrial Education and Architecture</td>
<td>1</td>
</tr>
<tr>
<td>Industrial Education and Electrical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Industrial Education and Forestry</td>
<td>1</td>
</tr>
<tr>
<td>Mechanical Engineering and Textile Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Poultry and Vocational Agricultural Education</td>
<td>1</td>
</tr>
<tr>
<td>Pre-Medicine and Arts and Sciences</td>
<td>1</td>
</tr>
<tr>
<td>Pre-Medicine and Textile Chemistry</td>
<td>2</td>
</tr>
<tr>
<td>Textile Chemistry and Civil Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Textile Chemistry and Textile Manufacturing</td>
<td>1</td>
</tr>
<tr>
<td>Textile Engineering and Civil Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Textile Engineering and Mechanical and Electrical Engineering</td>
<td>1</td>
</tr>
<tr>
<td>Textile Engineering and Textile Industrial Education</td>
<td>1</td>
</tr>
<tr>
<td>Textile Engineering and Textile Manufacturing</td>
<td>1</td>
</tr>
<tr>
<td>Textile Engineering and Weaving and Designing</td>
<td>1</td>
</tr>
<tr>
<td>Textile Manufacturing and Mechanical Engineering</td>
<td>1</td>
</tr>
</tbody>
</table>

### Masters

<table>
<thead>
<tr>
<th>Course</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Economics</td>
<td>56</td>
</tr>
<tr>
<td>Agricultural Education</td>
<td>74</td>
</tr>
<tr>
<td>Agricultural Engineering</td>
<td>21</td>
</tr>
<tr>
<td>Agronomy</td>
<td>14</td>
</tr>
<tr>
<td>Animal Science</td>
<td>15</td>
</tr>
<tr>
<td>Bacteriology</td>
<td>5</td>
</tr>
<tr>
<td>Botany</td>
<td>1</td>
</tr>
<tr>
<td>Ceramic Engineering</td>
<td>24</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>10</td>
</tr>
<tr>
<td>Chemistry</td>
<td>65</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>9</td>
</tr>
<tr>
<td>Dairy Science</td>
<td>12</td>
</tr>
<tr>
<td>Education</td>
<td>118</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>18</td>
</tr>
<tr>
<td>English</td>
<td>1</td>
</tr>
<tr>
<td>Entomology</td>
<td>35</td>
</tr>
<tr>
<td>Horticulture</td>
<td>27</td>
</tr>
<tr>
<td>Industrial Education</td>
<td>16</td>
</tr>
<tr>
<td>Industrial Management</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics</td>
<td>20</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>31</td>
</tr>
<tr>
<td>Nuclear Science</td>
<td>3</td>
</tr>
<tr>
<td>Physics</td>
<td>33</td>
</tr>
<tr>
<td>Plant Pathology</td>
<td>9</td>
</tr>
<tr>
<td>Poultry Science</td>
<td>4</td>
</tr>
<tr>
<td>Textile Chemistry</td>
<td>30</td>
</tr>
<tr>
<td>Textile Industrial Education</td>
<td>1</td>
</tr>
<tr>
<td>Water Resources Engineering</td>
<td>12</td>
</tr>
<tr>
<td>Zoology</td>
<td>15</td>
</tr>
</tbody>
</table>
### Doctors'

*Major Course*

<table>
<thead>
<tr>
<th>Major</th>
<th>Degrees Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agronomy</td>
<td>3</td>
</tr>
<tr>
<td>Chemistry</td>
<td>9</td>
</tr>
<tr>
<td>Entomology</td>
<td>4</td>
</tr>
<tr>
<td>Plant Pathology</td>
<td>2</td>
</tr>
</tbody>
</table>

**Total Degrees Awarded from 1896 through 1964**: 17,206
## Enrollment by Counties and States

**First Semester, 1964-1965**

<table>
<thead>
<tr>
<th>County</th>
<th>Total</th>
<th>State or Country</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbeville</td>
<td>28</td>
<td>Delaware</td>
<td>10</td>
</tr>
<tr>
<td>Aiken</td>
<td>105</td>
<td>District of Columbia</td>
<td>6</td>
</tr>
<tr>
<td>Allendale</td>
<td>17</td>
<td>Dutch West Indies</td>
<td>1</td>
</tr>
<tr>
<td>Anderson</td>
<td>246</td>
<td>Ecuador</td>
<td>1</td>
</tr>
<tr>
<td>Bamberg</td>
<td>17</td>
<td>El Salvador</td>
<td>2</td>
</tr>
<tr>
<td>Barnwell</td>
<td>18</td>
<td>England</td>
<td>1</td>
</tr>
<tr>
<td>Beaufort</td>
<td>16</td>
<td>Florida</td>
<td>100</td>
</tr>
<tr>
<td>Berkeley</td>
<td>32</td>
<td>Georgia</td>
<td>233</td>
</tr>
<tr>
<td>Calhoun</td>
<td>20</td>
<td>Hawaii</td>
<td>2</td>
</tr>
<tr>
<td>Charleston</td>
<td>304</td>
<td>Hawaii</td>
<td>2</td>
</tr>
<tr>
<td>Cherokee</td>
<td>49</td>
<td>Holland</td>
<td>2</td>
</tr>
<tr>
<td>Chester</td>
<td>43</td>
<td>Hong Kong</td>
<td>2</td>
</tr>
<tr>
<td>Chesterfield</td>
<td>26</td>
<td>Idaho</td>
<td>1</td>
</tr>
<tr>
<td>Clarendon</td>
<td>11</td>
<td>Illinois</td>
<td>9</td>
</tr>
<tr>
<td>Colleton</td>
<td>25</td>
<td>Indiana</td>
<td>3</td>
</tr>
<tr>
<td>Darlington</td>
<td>66</td>
<td>Indiana</td>
<td>3</td>
</tr>
<tr>
<td>Dillon</td>
<td>34</td>
<td>Iowa</td>
<td>2</td>
</tr>
<tr>
<td>Dorchester</td>
<td>30</td>
<td>Iran</td>
<td>1</td>
</tr>
<tr>
<td>Edgefield</td>
<td>15</td>
<td>Kansas</td>
<td>1</td>
</tr>
<tr>
<td>Fairfield</td>
<td>19</td>
<td>Kentucky</td>
<td>9</td>
</tr>
<tr>
<td>Florence</td>
<td>66</td>
<td>Korea</td>
<td>2</td>
</tr>
<tr>
<td>Georgetown</td>
<td>31</td>
<td>Lebanon</td>
<td>2</td>
</tr>
<tr>
<td>Greenville</td>
<td>383</td>
<td>Louisiana</td>
<td>11</td>
</tr>
<tr>
<td>Greenwood</td>
<td>88</td>
<td>Maine</td>
<td>1</td>
</tr>
<tr>
<td>Hampton</td>
<td>26</td>
<td>Maryland</td>
<td>74</td>
</tr>
<tr>
<td>Horry</td>
<td>63</td>
<td>Massachusetts</td>
<td>18</td>
</tr>
<tr>
<td>Jasper</td>
<td>2</td>
<td>Michigan</td>
<td>5</td>
</tr>
<tr>
<td>Kershaw</td>
<td>36</td>
<td>Minnesota</td>
<td>2</td>
</tr>
<tr>
<td>Lancaster</td>
<td>41</td>
<td>Mississippi</td>
<td>2</td>
</tr>
<tr>
<td>Laurens</td>
<td>76</td>
<td>Missouri</td>
<td>2</td>
</tr>
<tr>
<td>Lee</td>
<td>26</td>
<td>Montana</td>
<td>1</td>
</tr>
<tr>
<td>Lexington</td>
<td>38</td>
<td>Nebraska</td>
<td>3</td>
</tr>
<tr>
<td>Marion</td>
<td>18</td>
<td>New Hampshire</td>
<td>3</td>
</tr>
<tr>
<td>Marlboro</td>
<td>25</td>
<td>New Jersey</td>
<td>152</td>
</tr>
<tr>
<td>McCormick</td>
<td>6</td>
<td>New Mexico</td>
<td>1</td>
</tr>
<tr>
<td>Newberry</td>
<td>40</td>
<td>New York</td>
<td>111</td>
</tr>
<tr>
<td>Oconee</td>
<td>117</td>
<td>North Carolina</td>
<td>238</td>
</tr>
<tr>
<td>Orangeburg</td>
<td>82</td>
<td>Norway</td>
<td>1</td>
</tr>
<tr>
<td>Pickens</td>
<td>243</td>
<td>Ohio</td>
<td>20</td>
</tr>
<tr>
<td>Richland</td>
<td>147</td>
<td>Oklahoma</td>
<td>3</td>
</tr>
<tr>
<td>Saluda</td>
<td>21</td>
<td>Pakistan</td>
<td>1</td>
</tr>
<tr>
<td>Spartanburg</td>
<td>217</td>
<td>Panama</td>
<td>2</td>
</tr>
<tr>
<td>Sumter</td>
<td>82</td>
<td>Pennsylvania</td>
<td>102</td>
</tr>
<tr>
<td>Union</td>
<td>31</td>
<td>Peru</td>
<td>1</td>
</tr>
<tr>
<td>Williamsburg</td>
<td>34</td>
<td>Puerto Rico</td>
<td>3</td>
</tr>
<tr>
<td>York</td>
<td>123</td>
<td>Rhode Island</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>South Carolina</td>
<td>3,183</td>
</tr>
</tbody>
</table>

**State or Country** | **Total**
---|---
Alabama        | 19
Alaska         | 1
Arizona        | 2
Arkansas       | 2
British West Indies | 1
Burma          | 1
California     | 4
Canal Zone     | 6
Colombia       | 1
Colorado       | 1
Connecticut    | 28
Costa Rica     | 1
Cuba           | 1

**Grand Total**: 4,588
### NUMBER OF STUDENTS MAJORING IN EACH CURRICULUM, FIRST SEMESTER, 1964-1965

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior</td>
<td>6</td>
<td>23</td>
<td>11</td>
<td>6</td>
<td>20</td>
<td>8</td>
<td>1</td>
<td>16</td>
<td>13</td>
<td>2</td>
<td>60</td>
<td>12</td>
<td>93</td>
<td>7</td>
<td>1</td>
<td>5</td>
<td>15</td>
<td>6</td>
<td>14</td>
<td>25</td>
<td>54</td>
<td>78</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Junior</td>
<td>6</td>
<td>11</td>
<td>5</td>
<td>8</td>
<td>13</td>
<td>6</td>
<td>1</td>
<td>4</td>
<td>20</td>
<td>12</td>
<td>5</td>
<td>2</td>
<td>31</td>
<td>7</td>
<td>16</td>
<td>99</td>
<td>13</td>
<td>1</td>
<td>2</td>
<td>11</td>
<td>31</td>
<td>6</td>
<td>16</td>
<td>35</td>
</tr>
<tr>
<td>Sophomore</td>
<td>9</td>
<td>15</td>
<td>7</td>
<td>11</td>
<td>18</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>16</td>
<td>10</td>
<td>18</td>
<td>53</td>
<td>11</td>
<td>26</td>
<td>157</td>
<td>17</td>
<td>3</td>
<td>14</td>
<td>62</td>
<td>1</td>
<td>6</td>
<td>14</td>
<td>40</td>
<td>58</td>
</tr>
<tr>
<td>Freshman</td>
<td>6</td>
<td>15</td>
<td>29</td>
<td>9</td>
<td>19</td>
<td>31</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td>56</td>
<td>21</td>
<td>1</td>
<td>47</td>
<td>106</td>
<td>16</td>
<td>46</td>
<td>246</td>
<td>34</td>
<td>11</td>
<td>30</td>
<td>139</td>
<td>3</td>
<td>13</td>
<td>27</td>
</tr>
<tr>
<td>Postgraduate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unclassified</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6</strong></td>
<td><strong>36</strong></td>
<td><strong>78</strong></td>
<td><strong>32</strong></td>
<td><strong>44</strong></td>
<td><strong>23</strong></td>
<td><strong>4</strong></td>
<td><strong>9</strong></td>
<td><strong>108</strong></td>
<td><strong>56</strong></td>
<td><strong>8</strong></td>
<td><strong>67</strong></td>
<td><strong>250</strong></td>
<td><strong>39</strong></td>
<td><strong>100</strong></td>
<td><strong>595</strong></td>
<td><strong>71</strong></td>
<td><strong>2</strong></td>
<td><strong>16</strong></td>
<td><strong>60</strong></td>
<td><strong>247</strong></td>
<td><strong>4</strong></td>
<td><strong>31</strong></td>
<td><strong>71</strong></td>
</tr>
</tbody>
</table>
INDEX

Academic and Research ...................................... 9, 42
Academic Faculty ............................................. 11
Accounting Courses .......................................... 178
Accounting Division .......................................... 38
Administrative of University ................................ 42
Academic and Research ........................................ 9
Business and Financial Affairs .............................. 38
Development Activities ....................................... 39
Executive Student Affairs .................................... 36
Administrative Council ....................................... 38
Administrative Officers and Staff .......................... 9, 36, 38, 39
Admission ....................................................... 43
Admissions, Foreign Students ................................ 46
Admissions and Registration, Office of ..................... 36
Advanced Placement by Examination ....................... 105
Advanced Standing Students ................................ 44, 105
Aerospace Studies ............................................. 10, 81, 178
Agricultural Chemistry ....................................... 282
Agricultural Communications ................................ 278
Agricultural Curriculums ..................................... 116
Agricultural Economics ....................................... 116, 180, 279
Agricultural Education 118, 182, 279, 298
Agricultural Engineering 133, 159, 183, 279
Agricultural Experiment Station 278, 294
Agricultural Extension Service 278, 295
Agriculture and Biological Sciences ....................... 185
Agriculture, Basic Curriculum ................................ 116
Agriculture and Biological Sciences, College of ......... 9, 114, 277
Agronomy and Soils ........................................... 118, 185, 280
Air Force ....................................................... 79, 81
Alpha Phi Omega .............................................. 94
Alpha Tau Alpha, Agricultural Education Fraternity ... 92
Alpha Zeta, Agricultural Fraternity ........................ 92
Alumni ......................................................... 39, 89
Animal Physiology ............................................. 187
Animal Science ................................................. 120, 187, 280
Application Forms ............................................ 45
Architectural Foundation Lectures ......................... 96
Architecture Curriculum ...................................... 138
Architecture, Description of Courses ....................... 159
Architecture, School of ....................................... 9, 138
Army ......................................................... 79, 85
Arts and Sciences Curriculum ............................... 142
Arts and Sciences, College of ............................... 9, 142
Assistance ..................................................... 62
Athletic Council .............................................. 37
Athletics ....................................................... 37, 95, 98
Auditing Policies ............................................. 49, 108
Automobile Privileges ....................................... 98
Auxiliary Enterprises ........................................ 38
Awards to Students .......................................... 57, 68
Bachelor of Arts Curriculum ................................ 142
Bachelors' Degrees ......................................... 112
Bacteriology ................................................. 193
Bands ......................................................... 37, 96
Banking Accounts ............................................ 50
Bequest, Clemson ............................................ 88
Biochemistry ................................................... 194, 282
Biological Sciences .......................................... 9
Biology ....................................................... 134, 194
Block "C" Club ............................................... 85
Blue Key ..................................................... 94
Board of Trustees ........................................... 8, 42
Board of Visitors ............................................ 8
Board, Room, etc., Cost of ................................ 49
Books and Supplies ......................................... 50
Botany ....................................................... 194, 281
Branch Experiment Stations ................................. 278
Building Construction ....................................... 141
Buildings ..................................................... 78
Calendar ...................................................... 2, 4
Calhoun Mansion ............................................. 78
Ceramics ....................................................... 196
Ceramic Engineering Curriculum .......................... 161
Ceramic Engineering, Description of Courses .......... 196
Ceramic Engineering Forum ................................ 299
Chaplains ..................................................... 36
Charges, Schedule of ........................................ 49
Chemical Engineering ........................................ 162, 199
Chemistry, Agricultural ..................................... 282
Chemistry Courses .......................................... 205
Chemistry, General .......................................... 149
Chemistry, Textile .......................................... 175, 270
Churches ...................................................... 87
Civil Engineering ........................................... 164, 206
Classification Requirements ............................... 106
Clemson House Hotel ....................................... 38, 79
Clemson, Thomas G .......................................... 88
Clemson, Will of ............................................. 88
Clubs and Societies .......................................... 92
Committees of the Faculty .................................. 34
Comptroller ................................................... 9, 38, 45
Concert Series ................................................ 96
Counseling Services ......................................... 77
County Agents ................................................ 284
Courses of Study ............................................ 112
Course Prerequisites ........................................ 107
Courses, Rescheduling ....................................... 104
Credit by Examination ..................................... 105
Credit Load Limit ............................................ 107
Credits ....................................................... 102
Credit Work at Other Institutions 44, 106
Crop Pest Commission ...................................... 281, 297
Curriculums .................................................. 113
Dairy Science ................................................ 122, 210, 281
Dances ......................................................... 9, 42
Deferment ..................................................... 47
Degrees and Curriculums .................................... 111
Degrees, Bachelors' ......................................... 112
Degrees, Graduate .......................................... 113
Degrees, Requirements ..................................... 110
Demonstration Work ......................................... 278, 287
Description of Courses ..................................... 178
Development Activities, Administration of ............. 39, 43
Development Council ........................................ 39
Development, Vice-President ................................ 39, 43
Dining Hall ................................................... 54
Diploma ........................................................ 110
Dormitories ................................................... 38, 51
Dropping Class Work ........................................ 103
Economics, Agricultural ..................................... 116, 180, 279
Economics ..................................................... 212
Education, Agricultural 118, 182, 279, 298
Education, Description of Courses ....................... 214
Education, Industrial ........................................ 168, 239, 298
Educational Benefits for Veterans and War Orphans .... 46
Educational Council .......................................... 10
Electrical Extension Council 166, 215
Emeritus Faculty ............................................. 28
Employment, Part-time ....................................... 66
Engineering ................................................... 219
Engineering, Basic Curriculum ............................. 159
Engineering, College of 10, 158
Engineering Experiment Station ................................ 297
Engineering Graphics ......................................... 219
Engineering Mechanics ...................................... 220
English ........................................................ 222
Enrollment, Requirements to Continue .................... 105
Enrollment, 1893 ............................................. 42
Entomology ................................................... 125, 225, 282
Entrance Examinations ...................................... 45
Entrance Requirements ...................................... 43
Examinations .................................................. 109
<table>
<thead>
<tr>
<th>INDEX—Continued</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
</tr>
<tr>
<td>Examinations, Qualifying</td>
</tr>
<tr>
<td>Examinations, Special</td>
</tr>
<tr>
<td>Executive Officers</td>
</tr>
<tr>
<td>Expenses</td>
</tr>
<tr>
<td>Experimental Statistics</td>
</tr>
<tr>
<td>Experiment Station</td>
</tr>
<tr>
<td>Extended Programs</td>
</tr>
<tr>
<td>Extension Service</td>
</tr>
<tr>
<td>Extension Service Emeriti</td>
</tr>
<tr>
<td>Faculty</td>
</tr>
<tr>
<td>Faculty Committees</td>
</tr>
<tr>
<td>Faculty Emeriti</td>
</tr>
<tr>
<td>Faculty Senate</td>
</tr>
<tr>
<td>Farms Department</td>
</tr>
<tr>
<td>Fee, Late Registration</td>
</tr>
<tr>
<td>Fees</td>
</tr>
<tr>
<td>Fellowships</td>
</tr>
<tr>
<td>Fertilizer Inspection</td>
</tr>
<tr>
<td>Field House</td>
</tr>
<tr>
<td>Financial Assistance to Students</td>
</tr>
<tr>
<td>Food Service</td>
</tr>
<tr>
<td>Food Science</td>
</tr>
<tr>
<td>Foreign Students, Admission of</td>
</tr>
<tr>
<td>Forestry</td>
</tr>
<tr>
<td>Fort Hill</td>
</tr>
<tr>
<td>Foundation, Clemson University</td>
</tr>
<tr>
<td>Four H Club Work</td>
</tr>
<tr>
<td>Fraternities</td>
</tr>
<tr>
<td>French</td>
</tr>
<tr>
<td>230</td>
</tr>
<tr>
<td>77</td>
</tr>
<tr>
<td>Genetics</td>
</tr>
<tr>
<td>Geography</td>
</tr>
<tr>
<td>Geology and Mineralogy</td>
</tr>
<tr>
<td>German</td>
</tr>
<tr>
<td>234</td>
</tr>
<tr>
<td>Glee Club</td>
</tr>
<tr>
<td>Government Courses</td>
</tr>
<tr>
<td>Government of the University</td>
</tr>
<tr>
<td>Grade Points</td>
</tr>
<tr>
<td>Grades</td>
</tr>
<tr>
<td>104</td>
</tr>
<tr>
<td>102</td>
</tr>
<tr>
<td>230</td>
</tr>
<tr>
<td>Freshman Counseling</td>
</tr>
<tr>
<td>77</td>
</tr>
<tr>
<td>Genetics</td>
</tr>
<tr>
<td>Geography</td>
</tr>
<tr>
<td>Geology and Mineralogy</td>
</tr>
<tr>
<td>German</td>
</tr>
<tr>
<td>Glee Club</td>
</tr>
<tr>
<td>Government Courses</td>
</tr>
<tr>
<td>Government of the University</td>
</tr>
<tr>
<td>Grade Points</td>
</tr>
<tr>
<td>Grades</td>
</tr>
<tr>
<td>104</td>
</tr>
<tr>
<td>102</td>
</tr>
<tr>
<td>235</td>
</tr>
<tr>
<td>Graduation System</td>
</tr>
<tr>
<td>102</td>
</tr>
<tr>
<td>Graduates</td>
</tr>
<tr>
<td>89, 302</td>
</tr>
<tr>
<td>Graduate Degrees</td>
</tr>
<tr>
<td>113</td>
</tr>
<tr>
<td>Graduate School</td>
</tr>
<tr>
<td>10, 113</td>
</tr>
<tr>
<td>Graduate Work</td>
</tr>
<tr>
<td>113</td>
</tr>
<tr>
<td>Graduation Quality Requirements</td>
</tr>
<tr>
<td>110</td>
</tr>
<tr>
<td>Grounds and Buildings</td>
</tr>
<tr>
<td>78</td>
</tr>
<tr>
<td>Guidance Services</td>
</tr>
<tr>
<td>77</td>
</tr>
<tr>
<td>Health</td>
</tr>
<tr>
<td>37, 55</td>
</tr>
<tr>
<td>Historical Sketch of the University</td>
</tr>
<tr>
<td>88</td>
</tr>
<tr>
<td>History</td>
</tr>
<tr>
<td>235</td>
</tr>
<tr>
<td>Home Demonstration Service</td>
</tr>
<tr>
<td>278, 287</td>
</tr>
<tr>
<td>Home Economics</td>
</tr>
<tr>
<td>283</td>
</tr>
<tr>
<td>Honors</td>
</tr>
<tr>
<td>68, 108</td>
</tr>
<tr>
<td>Honors Program</td>
</tr>
<tr>
<td>108</td>
</tr>
<tr>
<td>Horticulture</td>
</tr>
<tr>
<td>127, 237, 283</td>
</tr>
<tr>
<td>Hospital</td>
</tr>
<tr>
<td>37, 55</td>
</tr>
<tr>
<td>Hotel, The Clemson House</td>
</tr>
<tr>
<td>38, 79</td>
</tr>
<tr>
<td>Housing for Married Students</td>
</tr>
<tr>
<td>54</td>
</tr>
<tr>
<td>Housing Student</td>
</tr>
<tr>
<td>51</td>
</tr>
<tr>
<td>Incomplete Work</td>
</tr>
<tr>
<td>103</td>
</tr>
<tr>
<td>Industrial Education</td>
</tr>
<tr>
<td>168, 239, 298</td>
</tr>
<tr>
<td>Industrial Engineering</td>
</tr>
<tr>
<td>169, 243</td>
</tr>
<tr>
<td>Industrial Management</td>
</tr>
<tr>
<td>174, 245</td>
</tr>
<tr>
<td>Industrial Management and Textile</td>
</tr>
<tr>
<td>Science, School of</td>
</tr>
<tr>
<td>10, 173</td>
</tr>
<tr>
<td>Intimate (See Hospital)</td>
</tr>
<tr>
<td>Information, General</td>
</tr>
<tr>
<td>Instructional and Research Assistants</td>
</tr>
<tr>
<td>30</td>
</tr>
<tr>
<td>Insurance, Student Accident and</td>
</tr>
<tr>
<td>Health</td>
</tr>
<tr>
<td>Iota Lambda Sigma, Industrial</td>
</tr>
<tr>
<td>Educational Fraternity</td>
</tr>
<tr>
<td>Industrial Education</td>
</tr>
<tr>
<td>168, 239, 298</td>
</tr>
<tr>
<td>Industrial Engineering</td>
</tr>
<tr>
<td>169, 243</td>
</tr>
<tr>
<td>Industrial Management</td>
</tr>
<tr>
<td>174, 245</td>
</tr>
<tr>
<td>Industrial Management and Textile</td>
</tr>
<tr>
<td>Science, School of</td>
</tr>
<tr>
<td>10, 173</td>
</tr>
<tr>
<td>Intimate (See Hospital)</td>
</tr>
<tr>
<td>Information, General</td>
</tr>
<tr>
<td>42</td>
</tr>
<tr>
<td>Instructional and Research Assistants</td>
</tr>
<tr>
<td>30</td>
</tr>
<tr>
<td>Insurance, Student Accident and</td>
</tr>
<tr>
<td>Topic</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>Reports</td>
</tr>
<tr>
<td>Requirements for Admission</td>
</tr>
<tr>
<td>Requirements for Classification</td>
</tr>
<tr>
<td>Requirements for Degrees</td>
</tr>
<tr>
<td>Requirements to Continue Enrollment</td>
</tr>
<tr>
<td>Rescheduling Courses</td>
</tr>
<tr>
<td>Research, Agricultural</td>
</tr>
<tr>
<td>Research Assistants</td>
</tr>
<tr>
<td>Research Faculty</td>
</tr>
<tr>
<td>Research Faculty Council</td>
</tr>
<tr>
<td>Research, Textile</td>
</tr>
<tr>
<td>Reserve Officers' Training Camp</td>
</tr>
<tr>
<td>Residence Requirement</td>
</tr>
<tr>
<td>Rifle Team</td>
</tr>
<tr>
<td>Rules for Classification</td>
</tr>
<tr>
<td>Rural Sociology</td>
</tr>
<tr>
<td>Russian</td>
</tr>
<tr>
<td>Scabbard and Blade</td>
</tr>
<tr>
<td>Scholarships</td>
</tr>
<tr>
<td>Scholastic Regulations</td>
</tr>
<tr>
<td>Science Teaching</td>
</tr>
<tr>
<td>Seed Certification</td>
</tr>
<tr>
<td>Selective Service Regulations</td>
</tr>
<tr>
<td>Short Courses and Conferences</td>
</tr>
<tr>
<td>Sigma Pi Sigma</td>
</tr>
<tr>
<td>Sigma Tau Epsilon</td>
</tr>
<tr>
<td>Sirrine Foundation</td>
</tr>
<tr>
<td>Societies</td>
</tr>
<tr>
<td>Societies, College of Agriculture and Biological Sciences</td>
</tr>
<tr>
<td>Societies, School of Architecture</td>
</tr>
<tr>
<td>Societies, Engineering</td>
</tr>
<tr>
<td>Societies, School of Industrial Management and Textile Science</td>
</tr>
<tr>
<td>Sociology</td>
</tr>
<tr>
<td>Sociology, Rural</td>
</tr>
<tr>
<td>Soil Testing</td>
</tr>
<tr>
<td>Spanish</td>
</tr>
<tr>
<td>Statistical Services</td>
</tr>
<tr>
<td>Student Affairs</td>
</tr>
<tr>
<td>Student Body</td>
</tr>
<tr>
<td>Student Financial Aid</td>
</tr>
<tr>
<td>Student Government</td>
</tr>
<tr>
<td>Student Placement</td>
</tr>
<tr>
<td>Student Banking Accounts</td>
</tr>
<tr>
<td>Student Center</td>
</tr>
<tr>
<td>Student Clubs</td>
</tr>
<tr>
<td>Student Awards</td>
</tr>
<tr>
<td>Student Health Service</td>
</tr>
<tr>
<td>Students, Women</td>
</tr>
<tr>
<td>Summer Sessions</td>
</tr>
<tr>
<td>Tau Beta Pi Engineering Fraternity</td>
</tr>
<tr>
<td>Teacher Education</td>
</tr>
<tr>
<td>Textbooks</td>
</tr>
<tr>
<td>Textile Chemistry</td>
</tr>
<tr>
<td>Textiles</td>
</tr>
<tr>
<td>Textile Science</td>
</tr>
<tr>
<td>Tiger Brotherhood</td>
</tr>
<tr>
<td>Trade Teaching</td>
</tr>
<tr>
<td>Transcripts of Records</td>
</tr>
<tr>
<td>Trustees</td>
</tr>
<tr>
<td>Tuition</td>
</tr>
<tr>
<td>Uniforms</td>
</tr>
<tr>
<td>University Organization</td>
</tr>
<tr>
<td>Veterans, Educational Benefits</td>
</tr>
<tr>
<td>Visitors, Board of</td>
</tr>
<tr>
<td>Withdrawals</td>
</tr>
<tr>
<td>Women Students</td>
</tr>
<tr>
<td>Y. M. C. A.</td>
</tr>
<tr>
<td>Zoology</td>
</tr>
</tbody>
</table>
CLEMSON UNIVERSITY RECORD

SPECIAL APPENDIX

FOR

SECOND SEMESTER

Second Semester Enrollment
ENROLLMENT BY COUNTIES AND STATES
1964-1965

<table>
<thead>
<tr>
<th>County</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbeville</td>
<td>31</td>
</tr>
<tr>
<td>Aiken</td>
<td>113</td>
</tr>
<tr>
<td>Allendale</td>
<td>17</td>
</tr>
<tr>
<td>Anderson</td>
<td>265</td>
</tr>
<tr>
<td>Bamberg</td>
<td>17</td>
</tr>
<tr>
<td>Barnwell</td>
<td>23</td>
</tr>
<tr>
<td>Beaufort</td>
<td>16</td>
</tr>
<tr>
<td>Berkeley</td>
<td>37</td>
</tr>
<tr>
<td>Calhoun</td>
<td>20</td>
</tr>
<tr>
<td>Charleston</td>
<td>319</td>
</tr>
<tr>
<td>Cherokee</td>
<td>49</td>
</tr>
<tr>
<td>Chester</td>
<td>47</td>
</tr>
<tr>
<td>Chesterfield</td>
<td>27</td>
</tr>
<tr>
<td>Clarendon</td>
<td>14</td>
</tr>
<tr>
<td>Colleton</td>
<td>26</td>
</tr>
<tr>
<td>Darlington</td>
<td>69</td>
</tr>
<tr>
<td>Dillon</td>
<td>34</td>
</tr>
<tr>
<td>Dorchester</td>
<td>32</td>
</tr>
<tr>
<td>Edgefield</td>
<td>16</td>
</tr>
<tr>
<td>Fairfield</td>
<td>20</td>
</tr>
<tr>
<td>Florence</td>
<td>69</td>
</tr>
<tr>
<td>Georgetown</td>
<td>35</td>
</tr>
<tr>
<td>Greenville</td>
<td>409</td>
</tr>
<tr>
<td>Greenwood</td>
<td>90</td>
</tr>
<tr>
<td>Hampton</td>
<td>28</td>
</tr>
<tr>
<td>Horry</td>
<td>63</td>
</tr>
<tr>
<td>Jasper</td>
<td>2</td>
</tr>
<tr>
<td>Kershaw</td>
<td>38</td>
</tr>
<tr>
<td>Lancaster</td>
<td>46</td>
</tr>
<tr>
<td>Laurens</td>
<td>80</td>
</tr>
<tr>
<td>Lee</td>
<td>28</td>
</tr>
<tr>
<td>Lexington</td>
<td>43</td>
</tr>
<tr>
<td>Marion</td>
<td>21</td>
</tr>
<tr>
<td>Marlboro</td>
<td>26</td>
</tr>
<tr>
<td>McCormick</td>
<td>7</td>
</tr>
<tr>
<td>Newberry</td>
<td>41</td>
</tr>
<tr>
<td>Oconee</td>
<td>137</td>
</tr>
<tr>
<td>Orangeburg</td>
<td>85</td>
</tr>
<tr>
<td>Pickens</td>
<td>281</td>
</tr>
<tr>
<td>Richland</td>
<td>153</td>
</tr>
<tr>
<td>Saluda</td>
<td>21</td>
</tr>
<tr>
<td>Spartanburg</td>
<td>227</td>
</tr>
<tr>
<td>Sumter</td>
<td>89</td>
</tr>
<tr>
<td>Union</td>
<td>34</td>
</tr>
<tr>
<td>Williamsburg</td>
<td>36</td>
</tr>
<tr>
<td>York</td>
<td>129</td>
</tr>
</tbody>
</table>

**South Carolina Total** 3,410

<table>
<thead>
<tr>
<th>State or Country</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delaware</td>
<td>11</td>
</tr>
<tr>
<td>District of Columbia</td>
<td>7</td>
</tr>
<tr>
<td>Dutch West Indies</td>
<td>1</td>
</tr>
<tr>
<td>Ecuador</td>
<td>1</td>
</tr>
<tr>
<td>El Salvador</td>
<td>2</td>
</tr>
<tr>
<td>England</td>
<td>1</td>
</tr>
<tr>
<td>Florida</td>
<td>104</td>
</tr>
<tr>
<td>Georgia</td>
<td>240</td>
</tr>
<tr>
<td>Haiti</td>
<td>1</td>
</tr>
<tr>
<td>Hawaii</td>
<td>2</td>
</tr>
<tr>
<td>Holland</td>
<td>2</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>2</td>
</tr>
<tr>
<td>Idaho</td>
<td>1</td>
</tr>
<tr>
<td>Illinois</td>
<td>10</td>
</tr>
<tr>
<td>India</td>
<td>4</td>
</tr>
<tr>
<td>Indiana</td>
<td>3</td>
</tr>
<tr>
<td>Iowa</td>
<td>2</td>
</tr>
<tr>
<td>Iran</td>
<td>1</td>
</tr>
<tr>
<td>Kansas</td>
<td>1</td>
</tr>
<tr>
<td>Kentucky</td>
<td>10</td>
</tr>
<tr>
<td>Korea</td>
<td>3</td>
</tr>
<tr>
<td>Lebanon</td>
<td>2</td>
</tr>
<tr>
<td>Louisiana</td>
<td>12</td>
</tr>
<tr>
<td>Maine</td>
<td>1</td>
</tr>
<tr>
<td>Maryland</td>
<td>77</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>20</td>
</tr>
<tr>
<td>Michigan</td>
<td>6</td>
</tr>
<tr>
<td>Minnesota</td>
<td>2</td>
</tr>
<tr>
<td>Mississippi</td>
<td>2</td>
</tr>
<tr>
<td>Missouri</td>
<td>2</td>
</tr>
<tr>
<td>Montana</td>
<td>1</td>
</tr>
<tr>
<td>Nebraska</td>
<td>3</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>3</td>
</tr>
<tr>
<td>New Jersey</td>
<td>167</td>
</tr>
<tr>
<td>New Mexico</td>
<td>1</td>
</tr>
<tr>
<td>New York</td>
<td>119</td>
</tr>
<tr>
<td>North Carolina</td>
<td>273</td>
</tr>
<tr>
<td>Norway</td>
<td>2</td>
</tr>
<tr>
<td>Ohio</td>
<td>20</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>3</td>
</tr>
<tr>
<td>Pakistan</td>
<td>3</td>
</tr>
<tr>
<td>Panama</td>
<td>2</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>106</td>
</tr>
<tr>
<td>Peru</td>
<td>1</td>
</tr>
<tr>
<td>Puerto Rico</td>
<td>3</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>4</td>
</tr>
<tr>
<td>South Carolina</td>
<td>3,410</td>
</tr>
<tr>
<td>Syria</td>
<td>3</td>
</tr>
<tr>
<td>Taiwan</td>
<td>4</td>
</tr>
<tr>
<td>Tennessee</td>
<td>36</td>
</tr>
<tr>
<td>Texas</td>
<td>5</td>
</tr>
<tr>
<td>Thailand</td>
<td>4</td>
</tr>
<tr>
<td>Turkey</td>
<td>3</td>
</tr>
<tr>
<td>Utah</td>
<td>2</td>
</tr>
<tr>
<td>Venezuela</td>
<td>2</td>
</tr>
<tr>
<td>Vermont</td>
<td>2</td>
</tr>
<tr>
<td>Virginia</td>
<td>88</td>
</tr>
<tr>
<td>Washington</td>
<td>2</td>
</tr>
<tr>
<td>West Virginia</td>
<td>15</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>6</td>
</tr>
</tbody>
</table>

**Grand Total** 4,905
<table>
<thead>
<tr>
<th>Classification</th>
<th>Senior</th>
<th>Junior</th>
<th>Sophomore</th>
<th>Freshman</th>
<th>Postgraduate</th>
<th>Graduate</th>
<th>Unclassified</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>6251</td>
<td>620</td>
<td>8</td>
<td>16</td>
<td>100</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>6-10</td>
<td>711</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>11-15</td>
<td>10</td>
<td>8</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>16-20</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>21-25</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>26-30</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>31-35</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>36-40</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>41-45</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>46-50</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>51-55</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>56-60</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>61-65</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>66-70</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>71-75</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>76-80</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>81-85</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>86-90</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>91-95</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>96-100</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>732</td>
<td>75</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>