

**Summer Sessions 1971**

***NORTH CAROLINA STATE UNIVERSITY***  
***at RALEIGH***

**NORTH CAROLINA STATE RECORD** Published four times a year in February, June, August and December by North Carolina State University at Raleigh, Department of Admissions, Pease Hall, P. O. Box 5128, Raleigh, N. C. 27607. Second class postage paid at Raleigh, N. C. 27611.

**VOLUME 71**

**FEBRUARY 1971**

**NUMBER 1**

Gloria J. Heacock, University Catalog Editor; Charles F. Kolb, Associate Director of Summer Sessions; E. Walton Jones, Acting Director of Summer Sessions. Published by the North Carolina State University Print Shop.



Summer Sessions 1971

North Carolina State University • Raleigh

**The Director of Summer Sessions  
North Carolina State University  
Box 5125  
Raleigh, N.C. 27607**

**SUMMER SESSIONS CATALOG 1971**

NORTH CAROLINA STATE UNIVERSITY  
AT RALEIGH

**SUMMER SESSIONS REGISTRATION APPLICATION**  
**BEFORE FILLING OUT THIS FORM, READ CAREFULLY THE INFORMATION ON THE OPPOSITE PAGE**  
(Print in Ink or Type all Information Except Signature)

Mr. \_\_\_\_\_ Social Security No. \_\_\_\_\_  
Mrs. \_\_\_\_\_ Sex \_\_\_\_\_ Married No \_\_\_\_\_  
Miss \_\_\_\_\_ (Last) \_\_\_\_\_ (First) \_\_\_\_\_ (Middle) \_\_\_\_\_ Yes \_\_\_\_\_  
\_\_\_\_\_ Sex \_\_\_\_\_ Married No \_\_\_\_\_

1. Full Name \_\_\_\_\_  
2. Permanent address: \_\_\_\_\_  
(if under 21, parent's or guardian's name and address)  
\_\_\_\_\_ (City) \_\_\_\_\_ (County) \_\_\_\_\_ (State) \_\_\_\_\_ (Zip Code)

3. Mailing Address \_\_\_\_\_ (Street, RFD, or P. O. Box Number) \_\_\_\_\_ (City) \_\_\_\_\_ (County) \_\_\_\_\_ (State) \_\_\_\_\_ (Zip Code)  
Yes \_\_\_\_\_  
Resident of N.C. No \_\_\_\_\_ Home Phone \_\_\_\_\_

4. Place of Birth \_\_\_\_\_ (City) \_\_\_\_\_ (State) \_\_\_\_\_ Birth Date \_\_\_\_\_ Citizenship \_\_\_\_\_ (Country)  
Yes \_\_\_\_\_  
5. High School Diploma No \_\_\_\_\_ Where \_\_\_\_\_ 6. Ever Attended N. C. State University? No \_\_\_\_\_ Last Date \_\_\_\_\_

7. List schools or colleges attended since high school: (Failure to furnish full information may bar admission.)  
\_\_\_\_\_  
SCHOOL OR COLLEGE \_\_\_\_\_ DATES ATTENDED \_\_\_\_\_

8. Degree(s) Received \_\_\_\_\_ Where \_\_\_\_\_ When \_\_\_\_\_ Yes \_\_\_\_\_ 9. If you are a college graduate do you desire graduate credit? No \_\_\_\_\_ Yes \_\_\_\_\_  
10. Ever suspended from a university or college? No \_\_\_\_\_ Where \_\_\_\_\_ 11. Are you eligible to return to the last institution attended? No \_\_\_\_\_ Yes \_\_\_\_\_  
12. Indicate below the courses you wish to take this summer. Be sure you do not indicate with conflicting times.  
\_\_\_\_\_  
FIRST SESSION SECOND SESSION

Dept. Abbrev. & Course No.	Credit Hours	Dept. Abbrev. & Course No.	Credit Hours	Title	Title

13. Have you made application to attend North Carolina State for the fall semester? \_\_\_\_\_ 14. Summer Session you desire to attend:  First Session  Second Session  
\_\_\_\_\_  
(Signature) \_\_\_\_\_ (Date) \_\_\_\_\_

OFFICE USE ONLY

Action 33 DOB 55-57 Status 60 Sex 61 School 62-63 Class 64-65 GPA 66-67-68 Residence 69-70-71 Year 72-74  
AS HP HF HP QP T-Cr THP THP Student Number 75-76-77-78-79-80

# NORTH CAROLINA STATE UNIVERSITY

## Summer Sessions

### REGISTRATION APPLICATION INFORMATION

Only special students are eligible to use the enclosed summer sessions registration application.

The registration application form on the opposite page *must* be used by all visiting students from other colleges or universities who will be classified as *special students* and by all students who are currently classified as *special students* at North Carolina State University.

A *special student* is one who has not been formally admitted as a degree candidate to North Carolina State University and does not wish a regular classification of any kind at the University. Students classified as special students are limited to a class load of not more than seven semester hours. However, in unusual cases, a special student visiting from another school may be allowed to take more than seven hours provided permission is obtained from the Director of Summer Sessions.

**NOTE:** Special students from other universities and colleges are advised that North Carolina State University students are always given priority for Summer Sessions classes.

### STUDENTS NOT ELIGIBLE TO USE THE ENCLOSED SUMMER SESSIONS REGISTRATION APPLICATION

1. The registration application form on the opposite page is *not* to be used by any classified degree candidate, undergraduate or graduate, now attending North Carolina State University. Such students must pre-register through their advisers.
2. The registration application on the opposite page is *not* to be used by any student who has previously enrolled as a degree candidate at North Carolina State University. Such students (former students returning) must apply for readmission to the University by writing to the Registrar, Department of Registration and Records, Peele Hall, North Carolina State University, Raleigh, North Carolina 27607.

### INFORMATION

For additional information about the Summer Sessions write to:

The Director of Summer Sessions  
North Carolina State University  
Box 5125  
Raleigh, N. C. 27607

or call 755-2265

# CONTENTS

The University of North Carolina .....	4
Calendar .....	5
Administration .....	7
North Carolina State University .....	9
The Summer Sessions .....	10
Admissions .....	10
Registration .....	13
Expenses .....	15
Financial Aid .....	17
Housing .....	17
D. H. Hill Library .....	18
Summer Activities .....	21
Erdahl-Cloyd Union .....	21
Special Courses and Institutes .....	22
Course Listings .....	27
Summer Sessions Faculty .....	103
Campus Map .....	116

# THE UNIVERSITY OF NORTH CAROLINA

(Six Component Institutions)

WILLIAM CLYDE FRIDAY, B.S., LL.B., LL.D., *President*

WILLIAM SMITH WELLS, A.B., A.M., Ph.D., *Vice-president—Academic Affairs*

ARNOLD KIMSEY KING, A.B., A.M., Ph.D., *Vice-president—Institutional Studies*

H. BROOKS JAMES, B.S., M.S., Ph.D., *Vice-president—Research and Public Service Programs*

NELSON F. TAYLOR, B.A., M.A., LL.B., *Vice-president—Administration*

L. FELIX JOYNER, A.B., *Vice-president—Finance*

ALEXANDER HURLBUTT SHEPARD, JR., M.A., *Assistant Vice-president and Treasurer*

JOSEPH SIBLEY DORTON, JR., B.S. *Assistant Vice-president and Assistant Treasurer*

GEORGE ELDRIDGE BAIR, B.A., M.A., Ph.D., *Director of Educational Television*

JAMES L. JENKINS, JR., A.B., *Assistant to the President*

RICHARD H. ROBINSON, JR., A.B., LL.B., *Assistant to the President*

By the act of the General Assembly of 1931 the University of North Carolina at Chapel Hill, the North Carolina College for Women at Greensboro (renamed the Woman's College of the University of North Carolina), and the North Carolina State College of Agriculture and Engineering at Raleigh were merged into The University of North Carolina.

By the act of the General Assembly of 1963 effective July 1, 1963, The University of North Carolina comprised: The University of North Carolina at Chapel Hill, The University of North Carolina at Greensboro and North Carolina State of The University of North Carolina at Raleigh.

By the act of the General Assembly of 1965 effective July 1, 1965, The University of North Carolina comprised: The University of North Carolina at Chapel Hill, The University of North Carolina at Charlotte, The University of North Carolina at Greensboro, and North Carolina State University at Raleigh.

By the act of the General Assembly of 1969 effective July 1, 1969, The University of North Carolina comprises: The University of North Carolina at Asheville, The University of North Carolina at Chapel Hill, The University of North Carolina at Charlotte, The University of North Carolina at Greensboro, The University of North Carolina at Wilmington and North Carolina State University at Raleigh.

Each institution has its own faculty and student body, and each is headed by a chancellor as its chief administrative officer. Unified general policy and appropriate allocation of function are effected by a single Board of Trustees and by the President with other administrative officers of The University. The general administration offices are located in Chapel Hill.

Members of the Board of Trustees are elected by the Legislature, and the Governor of North Carolina is chairman ex officio.

The chancellors of the component institutions are responsible to the President as the principal executive officer of The University of North Carolina.



# SUMMER SESSIONS CALENDAR 1971

## First Session

May 31-June 2	Monday- Wednesday	Opening days; residence halls open; counseling, advising, etc.
June 3	Thursday	New student orientation; registration and payment of fees; late registration fee for those who complete registration after 12:00 noon, June 3.
June 4	Friday	First day of classes.
June 5	Saturday	Regular class day.
June 8	Tuesday	Last day to register; last day to withdraw (or drop a course) with refund; last day to drop a course without a grade.
June 12	Saturday	Regular class day.
July 5	Monday	Holiday.
July 7	Wednesday	Last day of classes.
July 8	Thursday	Final examinations.

## Second Session

July 9	Friday	Opening day; residence halls open; counseling, advising, etc.
July 12	Monday	New student orientation; registration and payment of fees; late registration fee for those who complete registration after 12:00 noon, July 12.
July 13	Tuesday	First day of classes.
July 16	Friday	Last day to register; last day to withdraw (or drop a course) with refund; last day to drop a course without a grade.
July 17	Saturday	Regular class day.
July 24	Saturday	Regular class day.
August 12	Thursday	Last day of classes.
August 13	Friday	Final examinations.



# ADMINISTRATION

## NORTH CAROLINA STATE UNIVERSITY

John T. Caldwell, *Chancellor*

Harry C. Kelly, *Provost*

Walter J. Peterson, *Dean of the Graduate School*

Ralph W. Cummings, *Administrative Dean for Research*

E. Walton Jones, *Acting Administrative Dean for Extension and Acting  
Director of Continuing Education*

Banks C. Talley, *Dean of Student Affairs*

John D. Wright, *Administrator for Finance and Business*

Rudolph Pate, *Director of Foundations and Development*

## DEANS OF THE SCHOOLS

James E. Legates, *School of Agriculture and Life Sciences*

Henry L. Kamphoefner, *School of Design*

Carl J. Dolce, *School of Education*

Ralph E. Fadum, *School of Engineering*

Eric L. Ellwood, *School of Forest Resources*

Fred V. Cahill, *School of Liberal Arts*

Arthur C. Menius, Jr., *School of Physical and Mathematical Sciences*

David W. Chaney, *School of Textiles*

## SUMMER SESSIONS

E. Walton Jones, *Acting Director*

Charles F. Kolb, *Associate Director*

## ADMISSIONS

Kenneth D. Raab, *Director*

## REGISTRATION

Ronald C. Butler, *Registrar*



# NORTH CAROLINA STATE UNIVERSITY

North Carolina State University is the center for scientific and technological education, research and service in North Carolina. Created in 1887 by act of the North Carolina legislature as the state's land-grant institution, State was established primarily as a school of agriculture and mechanic arts. In the 82 years since its founding, however, its interests and responsibilities have been greatly broadened in response to the major scientific and technological demands of our rapidly changing world. While maintaining deep commitments to the agricultural and industrial interests of North Carolina, State has developed training and research programs of regional as well as national influence.

North Carolina State University is one of six universities comprising the Consolidated University of North Carolina, and as such, fulfills particular responsibilities for specialization in graduate and undergraduate training in technical and scientific areas. Undergraduate and graduate degrees may be earned in liberal arts and education as well as agriculture, the sciences, engineering, architecture and design, forest resources, mathematics and textiles.

State's organization includes eight undergraduate schools, the Graduate School and University Extension. The research, extension and instructional programs of these schools are supported and strengthened by several specialized divisions and offices including the Institutes of Statistics, Water Resources, Agricultural Policy and Biological Sciences; the Computing Center; the Agricultural and Industrial Extension Services; and the Agricultural Experiment Station with its 17 branch stations. State's facilities also include a minerals laboratory and a fisheries research station.

The University faculty and staff numbers about 3,500 including a graduate faculty of 835. The 1970 fall enrollment at State was 13,313. About 2,272 students are enrolled in graduate programs.

North Carolina State is accredited by the Southern Association of Colleges and Schools and the North Carolina Association of Colleges and Universities. In addition, individual schools and departments are accredited by various associations in their respective fields.

## THE SUMMER SESSIONS

The Summer Sessions at North Carolina State University offer an extensive education program planned to meet the varied needs and interests of over 8,000 students. Fifty departments offer instruction in over 500 courses, over one-third of which are at the graduate level.

Each of State's eight schools, with a combined faculty of more than 500, participates in the program for summer study: six schools offer courses during the two regular five-week sessions, the School of Design offers one nine-week program, the school of Forest Resources conducts a summer camp for sophomores and two five-week practicums, and the School of Agriculture and Life Sciences offers a three-week program for extension workers and other adult educators. In addition, many special programs and institutes are offered during the summer by the University.

Summer courses and special programs are designed for the new student, the undergraduate wanting to advance his academic standing at State, the graduate desiring to continue his study and research during the summer months and for visiting students pursuing degrees at other institutions. Teachers who need to earn credit toward renewal of teaching certificates or advanced degrees in education, and persons in professional fields who wish to keep abreast of new developments and trends also take advantage of State's summer programs. In addition, the Summer Sessions offer the opportunity of taking required subcollege work in English and mathematics to high school students planning to enroll at State.

## ADMISSIONS

Students of all races are equally welcome at North Carolina State University. Persons of all racial backgrounds may apply for and accept admission, confident that the policy and regular practice of the University will protect them from unfair discrimination.

Students are admitted to the Summer Sessions in one of seven categories: (1) new freshmen; (2) new undergraduate transfer students; (3) new graduate students; (4) special students; (5) continuing NCSU students; (6) former NCSU students; (7) suspended NCSU students.

### NEW FRESHMEN

Application forms for new freshmen should be obtained from the Director of Admissions, Peele Hall.

A freshman applicant should be a graduate of an accredited secondary school and have the recommendation of his principal or headmaster. Non-graduates should have a high school equivalency certificate. The following high school preparation, or its equivalent, is required: English, four years; algebra, two years; geometry, one year (advanced algebra and trigonometry are required for students entering the Schools of Engineering, Physical and

Mathematical Sciences, Design and Forest Resources); science, two years (including either chemistry or physics); social studies, two years (including U. S. history). Students entering the School of Liberal Arts must complete at least two years of foreign language.

Freshman applicants must take the Scholastic Aptitude Test of the College Entrance Examination Board and have their scores submitted to the Office of Admissions by the Board. These scores, together with the high school record, will be considered in determining admissibility. Information as to the time and place the Scholastic Aptitude Test will be given may be obtained from high school principals or counselors, or by writing directly to the College Entrance Examination Board, Box 592, Princeton, New Jersey, 08540 for the *Bulletin of Information*; it includes an application form and is available without charge.

Each admitted freshman, for best placement, should take one or more achievement tests, depending upon his curriculum and the courses he plans to take. Mathematics Level I or Level II should be taken by all entering freshmen. European History and World Cultures should be taken by all freshmen entering the Schools of Agriculture and Life Sciences, Engineering, Liberal Arts, and Physical and Mathematical Sciences. French, German or Spanish should be taken by entering freshmen who have had two or more years of one of these languages and who plan to continue studying the same modern language at North Carolina State University. The January and May test dates are recommended.

#### **NEW TRANSFER STUDENTS**

In addition to submitting an application form which may be obtained from the Director of Admissions, Peele Hall, all transfer students must have official transcripts sent to the Office of Admissions directly from all other colleges attended.

Transfer applicants must have an overall grade average of "C" (2.0) or better on *all* college-level academic work attempted and be eligible to return to the last college or university attended. For admission as an upper-class transfer student, the applicant must present a minimum of 28 semester hours of work with grades of "C" or better from accredited institutions. Those applicants with less than 28 semester hours of transferable credit must also meet the admissions requirements for entering freshmen. Out-of-state students should be prepared to meet higher standards especially in design, engineering, liberal arts, and physical and mathematical sciences.

#### **NEW GRADUATE STUDENTS**

All students working toward advanced degrees are enrolled in the Graduate School. An application for Graduate School admission may be obtained from the Dean of the Graduate School, Peele Hall.

#### **STUDENTS ADMITTED TO THE FALL SEMESTER**

Any student cleared for regular admission for the fall semester wishing to attend either summer session should notify the Admissions Office, Peele

Hall, to change his date of entrance. He should *not* fill out a summer sessions application.

### **SPECIAL STUDENTS**

Special students must complete the Summer Sessions Registration Application located in the front of this catalog. A special student is one who has not been formally admitted as a degree candidate at North Carolina State University. All students visiting from other schools will be classified as special students. Special students are limited to a class load of not more than seven semester hours. In unusual cases, a special student visiting from another college may be allowed to take more than seven hours if permission is obtained from the Director of Summer Sessions.

**NOTE:** Public school teachers who have never been enrolled as regular students at North Carolina State University and who are renewing an "A" certificate may register as special students if they desire; those renewing a graduate certificate should register as a Graduate Certificate Renewal or as a Graduate Special. The Division of Professional Services requires a graduate classification for the renewal of a graduate certificate. Students desiring regular graduate status must apply for admission through the Graduate Office.

### **CONTINUING STUDENTS**

Any regular NCSU degree candidate student may attend summer school. The summer school application in this catalog should *not* be completed but registration procedures as listed on pages 13-14 should be followed.

### **READMISSION**

Former North Carolina State University students who wish to attend the Summer Sessions must apply for readmission through the Office of Registration and Records at least 30 days prior to the intended date of return. The readmissions application may be obtained by writing to the Office of Registration and Records, Peele Hall, North Carolina State University, Raleigh, North Carolina 27607.

### **SUSPENDED NCSU STUDENTS**

Students suspended at the end of the spring semester, 1970, may attend one or both sessions of summer school to make up a quality point deficiency to become eligible to continue in the fall. The summer school application in this catalog should *not* be completed but registration procedures as listed on pages 13-14 should be followed.

Students suspended prior to the spring semester, 1970, may attend one or both sessions of summer school but should follow readmissions procedures.



# REGISTRATION

## PREREGISTRATION

All students who plan to attend summer school must preregister. Preregistration consists of selecting the courses to be taken during the first and/or second sessions, and filing the preregistration course request(s) with the Summer Sessions Office, Room 134, 1911 Building. The courses selected by each student are processed through the computer which assigns a day and hour for each course request. On registration day each student obtains his completed class schedule.

*Currently enrolled students* will preregister for the first and/or second session with their advisers at the time they preregister for the 1971 fall semester, April 13 through April 23.

*Former students returning* will preregister for the first and/or second session with their advisers during the period, April 13 through April 23, if possible. The last day to preregister for all students for the first session is May 21.

*New freshmen* who desire to attend summer school should contact the admissions office prior to May 21.

*Special students* will preregister through the Summer Sessions Office by mail or in person anytime through May 21. However, special students are encouraged to preregister as early as possible.

**NOTE:** The last day to preregister for all students for the first session is May 21. Students preregistering between April 13 and April 23 stand an excellent chance of enrolling in the courses of their choice.

A special preregister period for the second session will be held Monday, June 14 through Wednesday, June 16, for those students (special or regular) who have not preregistered previously. The last day to preregister for the second session is July 1.

## REGISTRATION

All students will complete registration on June 3 (first session) and/or July 12 (second session) at the Reynolds Coliseum. Completing registration consists of three steps: (a) completing registration cards, (b) obtaining previously prepared class schedule, and (c) paying tuition and fees.

Registration for the first session for all students will be held at Reynolds Coliseum on Thursday, June 3, from 8:30 a.m. to 12:00 noon.

Registration for the second session for all students will be held at Reynolds Coliseum on Monday, July 12, from 8:30 a.m. to 12:00 noon.

## LATE REGISTRATION

A late registrant is one who (a) fails to preregister and/or (b) fails to complete registration cards and obtain class schedule on June 3 or July 12. Late registrants will be charged a \$10 late registration fee.

## WITHDRAWAL FROM THE UNIVERSITY

If a regularly enrolled student wishes to withdraw from the University during a summer session or semester (dropping all course work for which he has registered), he must initiate the official withdrawal process at the Counseling Center. *Special students* who wish to withdraw should contact the Division of Continuing Education. Parental approval to withdraw is required for single students under 21.

Determination of grades and the entry on the permanent record for a student withdrawing during a summer session (or semester) depend upon his reasons for withdrawal, the time of withdrawal in the summer session (or semester), and his standing in his courses at the time of withdrawal. A student who discontinues attendance in all classes without officially withdrawing will receive all "FD" grades.

A student who withdraws after the fourth day of classes in a summer session (or after the first two weeks of classes in a regular semester) will not receive any refund of tuition and fees, except in unusual cases approved by the Refund Committee. The committee is empowered to approve a petition when the withdrawal is caused by extensive illness and upon the advice of a physician, military orders or when circumstances justify waiving the rules. These petitions are available in the Office of the Dean of the Division of Student Affairs.

## SPECIAL NOTES

1. Tuition and fees are payable by check or cash on the day of registration. Students must have the necessary funds with them.
2. Students planning to take courses in both sessions should plan their sequences well in advance. Offerings in the second session are often substantially less in number than in the first session, and, in many instances, departments do not offer courses in both sessions during the summer.
3. Everything possible will be done to ensure that the courses listed in this catalog will be given at the times indicated. The Director of the Summer Sessions reserves the right, however, to withdraw courses in which the enrollment is deemed insufficient.
4. The normal load for either session of summer school is six or seven semester hours. Any student may carry less. Regularly enrolled students who desire to carry more than seven hours must obtain the approval of the Dean or Director of Instruction of the school in which they are enrolled. Such approval must be in writing and presented to the Director of Summer Sessions. Students visiting from other schools who wish to take more than seven hours must obtain the approval of the Director of Summer Sessions.

## EXPENSES

The following expenses apply for each of the regular five-week sessions.

### TUITION AND FEES

RESIDENT				NONRESIDENT			
Hours	Tuition	Fees	Total	Hours	Tuition	Fees	Total
1	\$ 10.00	\$27.00	\$ 37.00	1	\$ 28.50	\$27.00	\$ 55.50
2	20.00	27.00	47.00	2	57.00	27.00	84.00
3	30.00	27.00	57.00	3	85.50	27.00	112.50
4	40.00	27.00	67.00	4	114.00	27.00	141.00
5	50.00	27.00	77.00	5	142.50	27.00	169.50
6	60.00	27.00	87.00	6	171.00	27.00	198.00
7	70.00	27.00	97.00	7	199.50	27.00	226.50
8	80.00	27.00	107.00	8	228.00	27.00	255.00
9	90.00	27.00	117.00	9	256.50	27.00	283.50
10	100.00	27.00	127.00	10	285.00	27.00	312.00

### REQUIRED FEES

(must be paid by all students)

Registration	\$ 7.00
Medical	4.00
Student Center	12.00
Physical Education	4.00
	<hr/>
	\$27.00

### SPECIAL REGISTRATION AND FEES

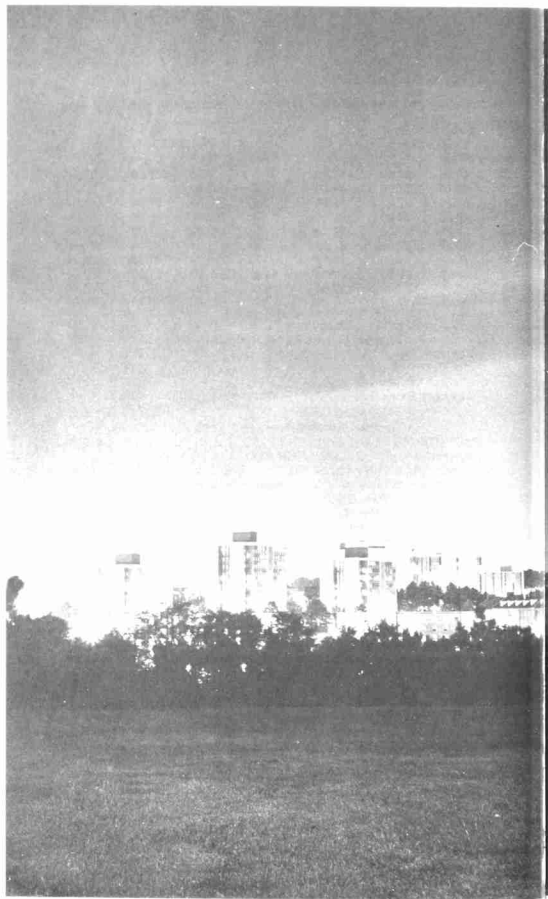
Degree Only (GR 599 or GR 699)	\$10.00
Thesis Preparation Only (GR 598 or GR 698)	
In-Residence (\$19.00 plus \$27.00 fees)	46.00
Not-In-Residence (\$19.00 plus \$7.00 registration fee)	26.00
Dissertation Research (GR 697)	
In-Residence (\$19.00 plus \$27.00 fees)	46.00
Not-In-Residence (\$19.00 plus \$7.00 registration fee)	26.00
Examination Only (GR 597)	
In-Residence (\$10.00 plus \$27.00 fees)	37.00
Not-In-Residence (\$10.00 plus \$7.00 registration fee)	17.00
Audits Only (Same as for credit)	
Full-Time Faculty and Staff	7.00

### REFUND OF TUITION AND FEES

A student who withdraws from school on or before the fourth day of classes of either summer session will receive a refund of the full amount paid less a registration fee. After the period specified, no refund will be made.

### REFUND COMMITTEE

In some instances circumstances justify the waiving of rules regarding refunds. An example might be withdrawal from the University because of illness. Students have the privilege of appeal to the refund committee when they feel special consideration is merited. Applications for such appeals may be secured from the Division of Student Affairs.



## FINANCIAL AID

The financial aid available to summer school students is ordinarily limited to loans and jobs. For summer visitor students, part-time employment is the only aid that can be offered.

Students who must have financial aid for summer school attendance should make application to the Financial Aid Office, 205 Peele Hall, as far in advance as possible, preferably by April 15.

## HOUSING

North Carolina State University provides housing facilities for summer school students in Lee Hall. To be eligible to reside in a residence hall during the summer school period, a student must be enrolled for one or more courses, employed by the University, recommended by the Counseling Center, a foreign student or approved for special reasons by the student Housing Office. Participants in short courses, conferences and workshops that are less than one month long will be housed in separate comparable University housing.

Each hall is staffed with selected students, both graduate and undergraduate, who are responsible to professionally trained administrative personnel. These staff members are available to assist and advise residents in any way possible. Also they have a responsibility for the operation and condition of the residence halls.

These are modern residence halls providing accommodations in a suite arrangement. Each suite has four double rooms and a bath. Rooms are furnished with beds, mattresses, chairs, desks, dressers and closets. Linen, pillows and blankets are available through the linen rental service operated by the Office of Auxiliary Enterprises. These buildings are not air-conditioned.

## ROOM RENTALS AND RESERVATIONS

Rooms in the residence halls for a five-week summer session rent for \$40 for men and \$45 for women. Rent must be paid before a room assignment can be made. A residence hall reservation card will be mailed to each student cleared for admission to regular summer school. This card and a check should be returned to the Office of Business Affairs.

## MAIL

Mail is delivered to the residence hall daily except Sunday. Regular five week summer students should have their mail addressed as follows:

"Name of Student"  
Post Office Box Number  
N. C. State University  
Raleigh, N. C. 27607

Participants in short courses, conferences and workshops that are less than one month should have their mail addressed to them in care of the director of their program.

## ROOM KEYS

Residents who have advance room assignments should go directly to their assigned residence hall where the keys will be issued. No deposit is required; however, failure to return keys (by the specified date at the end of the session or upon withdrawal from the University) will result in a fee being charged. Duplication of a University key is illegal.

## REFUND POLICY

*Room Reservations Cancelled Prior to the Day the Halls Officially Open*—If a room reservation is cancelled at the Housing Rental Office, Leazar Hall, in person or in writing prior to the day the halls officially open (the date of cancellation is the date notification is received at that office), the rent paid will be refunded less a \$10 reservation fee.

*Cancellations After the Halls Officially Open*—After this date, no refund will be made for any reason other than the failure to register, official withdrawal from the University or transfer to other University housing.

If a reservation is cancelled because of failure to register or official withdrawal from the University, the rent paid will be refunded less a \$10 reservation fee (nonrefundable).

*If a Student Fails to Check in and Secure His or Her Keys on or Before the First Day of Classes*—The reservation will be subject to cancellation and no refund will be made except as stated above.

## D. H. HILL LIBRARY

The D. H. Hill Library of North Carolina State University houses a collection of more than 500,000 volumes of books and bound journals. The collection has been developed to reflect the scientific and technological interests of the University, but the arts and social sciences are also well represented. The library subscribes to more than 6,500 current periodicals and receives all publications of the various experiment stations. The library has been a depository for U. S. Government publications since 1924 and has been designated as one of the depositories for all unclassified publications of the Atomic Energy Commission, National Aeronautics and Space Agency, as well as the Food and Agricultural Organization of the United Nations. Publications from many foreign countries are received on exchange—especially those publications dealing with the sciences and engineering.

Two special interest collections form on-campus branches of the main library. The Textiles Library contains outstanding holdings in textiles and textile chemistry. The School of Design Library has an excellent collection of books, journals and slides in the fields of architecture, landscape architecture and product design.



There are several reading rooms in the air-conditioned library building, and carrels, conference and seminar rooms are available for students and faculty. The library maintains a photocopy service, and equipment for reading microfilms and microcards is available.

The scholar, student and browser will each discover the materials and services of the library to be useful and enjoyable additions to his Summer Sessions programs.

Library hours for Summer Sessions are as follows:

Mon.-Fri.	8:00 a.m.-11:00 p.m.
Saturday	8:00 a.m.- 5:00 p.m.
Sunday	2:00 p.m.- 6:00 p.m.





## SUMMER ACTIVITIES

Through many curricular and extracurricular activities, the Summer Sessions provide special opportunities to those students engaged in summer study. Interesting, informative and entertaining programs and activities are scheduled for each session.

A few of the more popular activities and special features include the Carmichael Gym athletic and recreation programs and the varied activities sponsored by the Erdahl-Cloyd Union.

The University's regular program of student personnel services is available to summer students. It includes the counseling service for educational, career and personal counseling; the placement service for part-time jobs and career placement; the housing office for residence quarters; the student aid office for financial assistance; and the student health office for medical care.

Several of State's buildings are air-conditioned for summer comfort. Among these are the Student Supply Store, where students will find books and equipment for recreational as well as academic pursuits; Harrelson Hall, State's unusual round classroom building where more than half of the Summer Sessions classes are held; the Erdahl-Cloyd student union; and Harris dining hall, conveniently located near many of the residence halls.

Beyond the campus, the City of Raleigh offers many cultural and recreational opportunities of interest to students. The Raleigh Little Theatre presents several productions during the summer; the North Carolina Museum of Art sponsors gallery concerts and exhibits; and there are several swimming pools and city and state parks located in and around Raleigh.

## ERDAHL-CLOYD UNION

The center of campus summer activity is the Erdahl-Cloyd Union. The union is supported in part by student fees, and all regularly enrolled students are invited to attend, without further charge, the programs and activities sponsored by the Summer Programs Board.

These programs include movies and a variety of social and recreational events.

The completely air-conditioned union offers many facilities, including a television lounge, an art gallery, offices for student organizations, a billiards room, barber shop, cloak room, snack bar, dining room, hotel room, theater and meeting rooms.

Building hours during the summer are:

Monday-Saturday	7:00 a.m.-11:00 p.m.
Sunday	9:00 a.m.-11:00 p.m.

# SPECIAL COURSES AND INSTITUTES

## SPECIAL COURSE FOR ENTERING FRESHMEN

Students beginning their college study in the First Summer Session are encouraged to enroll in *Career Development and Effective Study Techniques*. Tests of vocational aptitude and interest, together with occupational information, will be used to help the student assess the possibilities of various careers. How to study effectively and other topics related to adjustment to college life and study will be the second concern of the course. Individual counseling will supplement class activity. The course will not count as college credit but will be roughly equivalent to a two hour course in class time.

The class will meet each weekday at 1340 until 1440. Additional sections will be added if there is sufficient demand. Fee for the course is \$5.00. Students should register at the Counseling Center Office, 210 Peele Hall on or before the day of the first class meeting, Friday, June 4.

Students who enroll in this course should, if possible, participate also in the *Summer Reading Workshop*.

## SUMMER READING WORKSHOP

The annual Summer Reading Workshop sponsored by the School of Education will provide a reading improvement section for entering college students during the first session. Scores on college entrance tests indicate that a number of incoming freshmen could benefit from training in the improvement of reading rate, comprehension and vocabulary building.

Entering college students who are interested in registering for this training should contact Dr. Paul Rust (402 S Poe), Director of the Reading Workshop. The workshop will meet from 1000-1100 on Monday, Wednesday and Friday mornings in 517 Poe Hall.

## DEPARTMENT OF ADULT AND COMMUNITY COLLEGE EDUCATION

### SPECIAL THREE-WEEK SUMMER SESSION FOR ADULT EDUCATORS JUNE 21-JULY 9

The Department of Adult and Community College Education is offering a special summer program of instruction at the graduate level for extension workers, community college staff members and other adult educators. The program is designed to provide adult educators with the opportunity to increase their understanding of the adult and society, the theories of learn-

ing, planning, social action and group processes requisite to effecting change among people.

The program is an interdisciplinary approach which utilizes the professional competence of a permanent and associate faculty. The program content encompasses theories and concepts which have applicability to all adult and community college organizations. Courses taught are in three major categories: (1) Adult Education, (2) Behavioral and Social Sciences, and (3) Natural Sciences.

Fifteen three-credit courses will be offered. Each participant may take only one course. Persons desiring graduate credit must register as a "graduate special" or make application for admission to the Graduate School.

Students desiring to take a special three week course must register through the Department of Adult and Community College Education. Special applications may be obtained from Dr. Robert J. Dolan, Professor of Adult and Community College Education, 310 Poe Hall. Students must use this special application rather than register through regular procedures. Applications must be submitted by Friday, June 4.

The following courses will be offered:

ANS 404	Dairy Cattle Management
BAE 590	Special Problems (Environmental and Structural Requirements in Farm Building)
ED 503	The Programming Process in Adult Education
ED 505	Public Area Schools (Emphasis on Community College Administration)
ED 559	Principles of Adult Education
ED 596(A)	Concepts, Principles and Strategies of Understanding, Motivating and Teaching Disadvantaged Adults
ED 596(B)	Supervision in Adult Education
ED 596(C)	Concepts, Principles and Techniques of Developing and Administering Youth Programs
ED 601	Theory of Organization and Administration in Adult Education II (Emphasis on Administration)
ENT 590 (ANS 590, CS 591, HS 599, PP 595)	Special Problems (Agriculture Chemicals)
FS 591	Special Problems in Food Science (The Science of Modern Foods)
HE 623*	Current Trends in Nutrition
HS 441	Floriculture I (Greenhouse Management)
SOC 501 (ED 501)	Leadership
ZO 560 (BO 560)	Principles of Ecology

---

\* This course will be taught at UNC-Greensboro.

# INSTITUTE IN EARTH SCIENCE FOR SECONDARY SCHOOL TEACHERS

JUNE 14-JULY 23

\* A summer Institute in Earth Science for secondary school science teachers will be conducted by the Departments of Mathematics and Science Education and Geosciences and supported by the National Science Foundation. Participants will be enrolled in three courses—Physical-Historical Geology, Weather and Climate, and Seminar in the Teaching of Earth Science. Formal class sessions, laboratory work and field trips will be supplemented by special lectures and other programs.

Stipends, travel and dependency allowances will be provided from the National Science Foundation grant. Application forms are obtainable from: Director, Summer Institute in Earth Science, 326 Poe Hall, North Carolina State University, Raleigh, North Carolina 27607. Forty participants are to be selected to receive the stipend awards.

## SUMMER INSTITUTE FOR FOREIGN STUDENTS

JULY 12-AUGUST 13

The Summer Institute in English for Foreign Students at North Carolina State University is designed for those students from other countries who intend to pursue university studies or specialized training programs in the United States during the academic year beginning in the fall. It is designed to furnish them with intensive instruction and practice in the use of the English language. Emphasis is placed on developing fluency in speaking and understanding spoken English in addition to developing reading and writing skills. The institute also offers orientation to American life and institutions to give the students insight into the social and cultural aspects of life in the U. S. and help them to adjust to the new environment. There are field trips to various industries and places of historic, cultural and scenic interest on weekends.

Any student who has a score of 450 or above on the Test of English as a Foreign Language (TOEFL Test) or an equivalent facility in the use of spoken English is eligible to attend the institute. (Information about taking the TOEFL Test at one of the centers located in the students' home countries may be obtained by writing to: Test of English as a Foreign Language, Educational Testing Service, Princeton, New Jersey.)

Admission to the institute does not imply admission to the regular session at North Carolina State University or any other branch of the University of North Carolina.

The institute, which is sponsored by the Division of Continuing Education in cooperation with the Summer Sessions and the Department of Modern Languages, is under the direction of Miss Virginia M. Prichard of the Department of Modern Languages. All classroom work is conducted in

Harrelson Hall on the university campus. Classes, including language laboratory practice sessions, are held five and a half hours a day, Monday through Friday, from 0900 to 1230 and from 1400 to 1600. In addition, classes are held from 0930 to 1230 on Saturdays. Attendance at the institute does not carry academic credit.

The total cost of the five-week program is estimated to be approximately \$450.00. The cost of the institute is estimated on the basis of campus dormitory accommodations and meals at the campus cafeterias. Incidental expenses, such as laundry, dry cleaning, entertainment and so forth, are not included. (Room rent includes sheets and towels.)

Tuition, Books and Fees	\$250.00
Room in Campus Dormitory	66.00
Food (Estimated)	135.00

Financial assistance is available to those students who qualify for it. The Department of State has made available to the institute a number of tuition grants under the auspices of the Institute of International Education. To be eligible for one of these grants, a student must arrive in the U. S. just prior to the institute and must have been accepted at an American institution of higher learning for academic study in the fall.

For further information about the institute write to Mr. Kelly Crump, Program Coordinator, Division of Continuing Education, 121 1911 Building, North Carolina State University, Raleigh, North Carolina 27607. Information about financial assistance may be obtained by writing to the same address.

MECH. ENGR. HISTORY

PHYSICS  
NUCLEAR ENGR

5<sup>th</sup>

FRENCH  
GERMAN  
SPANISH

MATH

FORESTRY 4<sup>th</sup>

HORTICULTURE

IND. ARTS

IND. ENGR



# COURSE LISTINGS

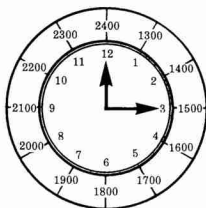
Courses are listed by department, IBM symbol and numerical designator. Semester hour credits for each course are given following the name of the course. Classes meet daily, Monday through Friday, except where specified to the contrary. The symbols "LR" and "LB" before the clock hours refer to lecture-recitation and laboratory hours, respectively. If there is no symbol before the clock hours, lecture-recitation is implied.

Courses numbered from one through 100 are preparatory courses carrying no college credit; courses in the 100, 200, 300 and 400 series are primarily designed for undergraduates; courses in the 500 series for graduates and advanced undergraduates; and courses in the 600 series for graduates only.

All courses are subject to cancellation by the Director of Summer Sessions if there is inadequate enrollment.

Waiver of prerequisites is at the discretion of the instructor.

Please note that class meeting times in this catalog are indicated in international time which is measured in hours numbered to 24 instead of 12.



If the schedule shows the class beginning at:	The beginning hour in terms of a 12-hour clock is:	If the schedule shows the class beginning at:	The beginning hour in terms of a 12-hour clock is:
8	8:00 a.m.	16	4:00 p.m.
9	9:00 a.m.	17	5:00 p.m.
10	10:00 a.m.	18	6:00 p.m.
11	11:00 a.m.	19	7:00 p.m.
12	12:00 noon	20	8:00 p.m.
13	1:00 p.m.	21	9:00 p.m.
14	2:00 p.m.	22	10:00 p.m.
15	3:00 p.m.		

## Animal Science

- ANS 404 DAIRY CATTLE MANAGEMENT 3  
*Prerequisite: ANS 204*  
A study of practical dairy farm management, including feed acquisition and utilization, breeding and selection, health and sanitation, milking herd replacement and dairy farm buildings with particular emphasis on the consequences of management alternatives and the importance of herd and farm business records.  
*Students desiring to take a special three-week course must register through the Department of Adult and Community College Education. Special applications may be obtained from Dr. Robert J. Dolan, Professor of Adult and Community College Education, 310 Poe Hall. Students must use this special application rather than register through regular procedures. Applications must be submitted by Friday, June 4. Special three-week session (June 21-July 9): 0900-1200*  
Mr. Davenport
- ANS 590 TOPICAL PROBLEMS IN ANIMAL SCIENCE Maximum 6  
Special problems may be selected or assigned in various phases of animal science.  
Both Sessions: Hours Arranged Staff
- ANS 699 RESEARCH IN ANIMAL SCIENCE Credits Arranged Staff  
Both Sessions: Hours Arranged Staff

## Biochemistry

- BCH 695 SPECIAL TOPICS IN BIOCHEMISTRY Credits Arranged  
*Prerequisite: Graduate standing in biochemistry*  
Critical study of special problems in modern biochemistry.  
Both Sessions: Hours Arranged Graduate Staff
- BCH 699 BIOCHEMICAL RESEARCH Credits Arranged Staff  
Both Sessions: Hours Arranged Graduate Staff

## Biological and Agricultural Engineering

- BAE 590 SPECIAL PROBLEMS Credits Arranged  
*Prerequisite: Senior or graduate standing in agricultural engineering*  
Each student will select a subject on which he will do research and write a technical report on his results. He may choose a subject pertaining to his particular interest in any area of study in biological and agricultural engineering.  
*Students desiring to take a special three-week course must register through the Department of Adult and Community College Education. Special applications may be obtained from Dr. Robert J. Dolan, Professor of Adult and Community College Education, 310 Poe Hall. Students must use this special application rather than register through regular procedures. Applications must be submitted by Friday, June 4. Special three-week session (June 21-July 9): LR 0900-1100; LB 1300-1600*  
Messrs. Driggers, Kriz  
Both Sessions: Hours Arranged Staff



BAE 699	RESEARCH IN BIOLOGICAL AND AGRICULTURAL ENGINEERING	Credits Arranged
	<i>Prerequisite: Graduate standing in biological and agricultural engineering</i>	
	A maximum of six credits is allowed toward a master's degree; no limitation on credits for doctoral program. Performance of a particular investigation of concern to biological and agricultural engineering. The study will begin with the selection of a problem and culminate with the presentation of a thesis.	
	Both Sessions: Hours Arranged	Graduate Staff

## Biological Sciences, Institute of

BS 100	GENERAL BIOLOGY	4
	Basic principles and concepts of biology, including the structure and function of cells and organisms, the organization and requirements of living systems, development, heredity and evolution.	
	First Session: LR 0800-0930 MTWTFSS; LB 1020-1300 or 1340-1620 TT or WF	Messrs. Braddy, Sherbine

## Botany

BS 100	GENERAL BIOLOGY	4
	(See biological sciences, above.)	
BO 360 (ZO 360)	INTRODUCTION TO ECOLOGY	4
	(See zoology, page 100.)	
BO 421	PLANT PHYSIOLOGY	4
	<i>Prerequisites: BS 100 or BO 200 and one year of college chemistry</i>	
	Physiology of the green plant emphasizing plant organization, water and solute relationships, inorganic and organic nutrition, growth and development.	
	First Session: LR 0950-1120; LB 1340-1650 WF	Mr. Noggle
BO 560 (ZO 560)	PRINCIPLES OF ECOLOGY	4
	(See zoology, page 100.)	
BO 590	TOPICAL PROBLEMS	1-3
	<i>Prerequisite: Consent of instructor</i>	
	Discussions and directed readings on problems of current interest in the fields of ecology, anatomy and morphology, taxonomy, and plant physiology. Arrangements must be made in advance with a faculty member and approved by the head of the department.	
	Both Sessions: Hours Arranged	Graduate Staff
BO 693	SPECIAL PROBLEMS IN BOTANY	Credits Arranged
	Directed research in a specialized phase of botany other than a thesis problem but designed to provide experience and training in botanical	

research. Arrangements must be made in advance with a faculty member and approved by the head of the department.  
Both Sessions: Hours Arranged Graduate Staff

BO 699 RESEARCH Credits Arranged  
Original research preliminary to writing a master's thesis or a doctoral dissertation.  
Both Sessions: Hours Arranged Graduate Staff

## Chemical Engineering

CHE 205 CHEMICAL PROCESS PRINCIPLES 3  
*Prerequisite: CH 107, MA 201*  
The primary emphasis of the course is the chemical interactions of matter and the physical interactions of multiphase systems. The course introduces engineering methods of treating material balances, stoichiometry, thermophysics, thermochemistry and first law of thermodynamics.  
First Session: 0730-0900 Mr. Rousseau

CHE 497 CHEMICAL ENGINEERING PROJECTS 1-3  
Elective for seniors in chemical engineering.  
Introduction to research through experimental, theoretical and literature studies of chemical engineering problems. Oral and written presentation of reports.  
Both Sessions: Hours Arranged Mr. Rousseau

CHE 597 CHEMICAL ENGINEERING PROJECTS 1-3  
*Prerequisite: Graduate standing*  
A laboratory study of some phase of chemical engineering or allied field.  
Both Sessions: Hours Arranged Mr. Rousseau

CHE 699 RESEARCH Credits Arranged  
Independent investigation of an advanced chemical engineering problem. A report of such an investigation is required as a graduate thesis.  
Both Sessions: Hours Arranged Graduate Staff

## Chemistry

CH 101 GENERAL CHEMISTRY I 4  
Fundamental concepts in chemistry, including atomic and molecular structure, states of aggregation of matter, chemical reactions and stoichiometry. Should be followed by CH 103, CH 105, or CH 107.  
Both Sessions: LR 0800-0930; LB 1340-1750 MW Staff

CH 103 GENERAL CHEMISTRY II 4  
*Prerequisites: CH 101*  
A continuation of CH 101, designed as a terminal course in chemistry

and for students in curricula which do not require full-year chemistry courses beyond the freshman level. The major part of the course is devoted to a survey of descriptive inorganic, organic and nuclear chemistry.

Both Sessions: LR 0950-1120; LB 1340 1750 TT Staff

CH 104 EXPERIMENTAL CHEMISTRY 1

*Corequisite: CH 105*

A laboratory course to supplement the lecture course CH 105. Required for students who take CH 105 and who intend to take additional chemistry courses.

First Session: 1340-1750 TT Staff

CH 105 CHEMISTRY-PRINCIPLES AND APPLICATIONS 3

*Prerequisite: CH 101*

A continuation of CH 101, intended primarily for engineering students, with emphasis on introductory chemical thermodynamics, equilibrium, electrochemistry, chemical kinetics, and the application of basic chemical principles to the treatment of organic and inorganic systems. CH 105 will serve as a prerequisite for additional chemistry courses only if accompanied by CH 104.

First Session: 0950-1120 Staff

CH 107 PRINCIPLES OF CHEMISTRY 4

*Prerequisite: CH 101 with a grade of C or better*

A continuation of CH 101, designed for students who plan to take full-year courses in advanced chemistry and for any qualified student desiring a more quantitative course than CH 103. The major part of the course is devoted to the detailed quantitative aspects of stoichiometry, kinetics, equilibrium and electrochemistry, and the treatment of chemical reactions in terms of acid-base concepts.

First Session: LR 0950-1120; LB 1340 1750 TT Staff

CH 111 FOUNDATIONS OF CHEMISTRY 5

A one-semester course in general chemistry designed primarily for students in liberal arts. Topics include atomic and molecular structure, periodic classification, gas laws, chemical equilibrium, and elementary descriptive inorganic and organic chemistry.

First Session: 1340 1620 Staff

CH 220 INTRODUCTORY ORGANIC CHEMISTRY 4

*Prerequisite: CH 103, or CH 107, or CH 104, and CH 105*

An introduction to the fundamental principles of organic chemistry included in the study of the hydrocarbons, alcohols, ethers, aldehydes, ketones, acids and their derivatives, esters, phenols, fats, carbohydrates, amino acids, proteins and a selected group of natural and synthetic products.

First Session: LR 0800-0930; LB 1340-1750 TT Staff

CH 221	ORGANIC CHEMISTRY I <i>Prerequisite: CH 107</i> Fundamentals of organic chemistry with emphasis on aliphatic and aromatic hydrocarbons and stereochemistry. Should be followed by CH 223. First Session: LR 0800-0930; LB 1340-1750 TT	4     Staff
CH 223	ORGANIC CHEMISTRY II <i>Prerequisite: CH 221</i> A continuation of CH 221 including a study of spectroscopy and structure, and the chemistry of alcohols, phenols, alkyl and aryl halides, ethers, carboxylic acids and their derivatives, carbonyl compounds, and amines. Second Session: LR 0800-0930; LB 1340-1750 TT	4     Staff
CH 315	QUANTITATIVE ANALYSIS <i>Prerequisite: CH 103, or CH 107, or CH 104 and CH 105</i> A one-semester course in volumetric and gravimetric analysis including techniques, stoichiometry and principles of neutralization, oxidation-reduction and precipitation methods. First Session: LR 0950-1120; LB 1340-1750 TT	4     Staff
CH 331	INTRODUCTORY PHYSICAL CHEMISTRY <i>Prerequisites: CH 103 or CH 107, or CH 104 and CH 105; MA 102 or MA 112</i> Designed for students whose background in mathematics and physics is not sufficient to meet the requirements of CH 431, CH 433, but who desire instruction on chemical principles in addition to that provided at the freshman level. First Session: LR 0950-1120; LB 1340-1750 MW	4     Staff
CH 431	PHYSICAL CHEMISTRY I <i>Prerequisites: CH 107, MA 202, PY 207 or PY 208</i> <i>Corequisite: MA 301</i> States of matter, thermodynamics, and physical and chemical equilibrium. Should be followed by CH 433 and/or CH 435. First Session: 0800-0930	3     Staff
CH 432	PHYSICAL CHEMISTRY I LABORATORY <i>Corequisite: CH 431</i> Laboratory course to accompany the lecture work in CH 431. First Session: 1340-1750 MW	1    Staff
CH 433	PHYSICAL CHEMISTRY II <i>Prerequisites: CH 431, MA 301</i> A continuation of CH 431, emphasizing properties of solutions, electrochemistry and reaction kinetics. Second Session: 0800-0930	3    Staff
CH 499	SENIOR RESEARCH IN CHEMISTRY <i>Prerequisite: Three years chemistry</i> An introduction to research. Independent investigation of a research	1-3

problem under the supervision of a member of the chemistry faculty.  
Both Sessions: Hours Arranged Staff

CH 699 CHEMICAL RESEARCH Credits Arranged  
*Prerequisite: Graduate standing in chemistry*  
Both Sessions: Hours Arranged Staff

## Civil Engineering

CE 202 INTRODUCTION TO CIVIL ENGINEERING 2  
*Prerequisite: MA 201*  
Introduction to the use of the digital computer for solving civil engineering problems.  
First Session: LR 0800-0900; LB 0910-1010 Staff

CE 324 STRUCTURAL ANALYSIS I 3  
*Prerequisite: EM 200*  
*Corequisite: EM 301*  
Stress analysis of statically determinate beams and framed structures under fixed and moving loads; influence line treatment for moving loads; analysis of displacements; energy principles.  
First Session: LR 0800-0900; LB 1340 1650 MW Staff

CE 332 STRUCTURAL MATERIALS II 3  
*Prerequisite: CE 331*  
Manufacture and properties of calcareous and bituminous cements and mineral aggregates. Mechanical properties of the following structural materials: Portland cement concrete, bituminous concrete, masonry materials and timber. Materials testing for research.  
First Session: LR 0910-1010; LB 1340 1650 TT Staff

CE 382 HYDRAULICS 3  
*Prerequisite: EM 303*  
Properties of fluids and mechanics of fluid flow in pipes and open channels; theory of design and characteristics of pumps and hydraulic motors; measurement of fluid flow.  
First Session: LR 1140-1310 Staff

CE 598 CIVIL ENGINEERING PROJECTS 1-6  
Special projects in some phase of civil engineering.  
Both Sessions: Hours Arranged Staff

CE 698 SPECIAL TOPICS IN CIVIL ENGINEERING 1-8  
*Prerequisites: Graduate standing*  
The study of special advanced topics of particular interest in various areas of civil engineering.  
Both Sessions: Hours Arranged Staff

CE 699 CIVIL ENGINEERING RESEARCH Credits Arranged  
Independent investigation of an advanced civil engineering problem; a report of such an investigation is required as a graduate thesis.  
Both Sessions: Hours Arranged Staff

## Computer Science

- CSC 101 INTRODUCTION TO PROGRAMMING 3  
Understanding algorithms, programs, and computers. Basic programming and program structure. Programming and computing systems. Debugging and verification of programs. Data representation. Organization and characteristics of computers. Survey of computers, languages, systems and applications. Computer solution of several numerical and nonnumerical problems using one or more programming languages.  
First Session: LR 1140-1310; LB 1340-1440, 1520-1620  
Second Session: LR 0800-0930; LB 1340-1440, 1520-1620
- CSC 111 ALGORITHMIC LANGUAGES I 2  
*Corequisite: MA 102*  
Introduction to a problem-oriented computer language for use in problem solution using digital computers. This language currently is FORTRAN IV. This course is designed as a two hour service course for scientifically oriented students, primarily for the School of Engineering. Programs to be written for this course will be slanted toward engineering applications.  
First Session: LR 0800-0930, 1140-1310; LB 1340-1440, 1520-1620  
Second Session: LR 0800-0930; LB 1340-1440, 1520-1620
- CSC 112 BASIC COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE 3  
*Prerequisite: CSC 101 or CSC 111*  
Brief historical background of computers and computing. Computer structure, machine language, instruction execution, addressing techniques, and digital representation of data. Computer systems organization. Symbolic coding and assembly systems. Introduction to macros, program segmentation, linkage and programming techniques.  
Both Sessions: 0800-0930
- CSC 211 PROGRAMMING LANGUAGES 3  
*Prerequisite: CSC 101 or CSC 111*  
Formal definition of programming languages including specification of syntax and semantics. Simple statements including precedence, infix, prefix and postfix notation. Global properties of algorithmic languages including scope of declarations, storage allocation, grouping of statements, binding times of constituents, procedures, coroutines and tasks. Data structures and data management in a programming language. Language features for list-processing, string manipulation, data description, and simulation. Compile-time features in a programming language. Run-time representation of program and data structures.  
Both Sessions: 0950-1120
- CSC 302 INTRODUCTION TO NUMERICAL METHODS 3  
*Prerequisite: CSC 101 or CSC 111*  
*Corequisite: MA 301 or MA 312*  
Computer techniques used to translate certain known computational algorithms into computer programs; practice in use of routines already available in the university program library. Areas of interest:

linear systems of equations; curve fitting and interpolation; algorithms for differentiation; solution of nonlinear equations, and solution of ordinary differential equations. Elementary discussion of errors.  
First Session: 1140-1310  
Second Session: 0950 1120

- CSC 311 DATA STRUCTURES 3  
*Prerequisite: CSC 112, CSC 211*  
*Corequisite: CSC 322*  
Basic concepts of data. Linear lists, strings, arrays, and orthogonal lists. Representation of trees and graphs. Storage systems and structures, and storage allocation and collection. Multilinked structures. Symbol tables and searching techniques. Sorting (ordering) techniques. Formal specification of data structures, data structures in programming, and generalized data management systems. Assigned problem set for course will include options which stress business data processing applications for those students interested in management science.  
First Session: 1140-1310  
Second Session: 0950-1120
- CSC 312 COMPUTER ORGANIZATION AND LOGIC -3  
*Prerequisite: CSC 322 or equivalent*  
Introduction to Boolean algebra, symbolic logic as used in computer organization, switching circuits, arithmetic circuits, applications of logic to problem solving.  
First Session: 0950-1120
- CSC 322 APPLIED ALGEBRAIC STRUCTURES 3  
*Prerequisite: CSC 211, MA 231*  
Naive set theory, order and equivalence relations, partitions and congruences. Lattices, Boolean algebra, semigroups, groups, rings, fields, graph theory. Logic of propositions, first order predicate calculus, models for a theory. Applications and examples of these algebraic structures in formal language description, data structures, file organization, information retrieval, games, switching circuits, neural nets, sequential machines, artificial intelligence, syntactic structure of arithmetic expressions and theory of algorithms.  
First Session: 0800-0930
- CSC 527 (MA 527) NUMERICAL ANALYSIS I 3  
*Prerequisite: CSC 101 or CSC 111, MA 301 or MA 312, MA 231 or MA 405*  
Theory of interpolation, numerical integration, iterative solution of nonlinear equations, numerical integration of ordinary differential equations, matrix inversion and solution of simultaneous linear equations.  
First Session: 1140-1310

## Crop Science

CS 591	SPECIAL PROBLEMS <i>Prerequisite: Consent of instructor</i> Both Sessions: Hours Arranged	Credits Arranged Staff
CS 699	RESEARCH <i>Prerequisite: Graduate standing</i> Both Sessions: Hours Arranged	Credits Arranged Staff

## Design

(These courses start First Session and run for nine weeks.)

DN 102	ENVIRONMENTAL DESIGN II <i>Prerequisite: DN 101</i> Required of first year students in the School of Design. Investigation of the sensory environment as a design determinant. Emphasis centered on individual discovery by the student who must function in problem formulating and problem-solving processes. The course was designed to develop technical skills simultaneously with development of conceptual models. Special nine-week session: 1300-1700	4 Mr. Randle
DN 112	PERCEPTION AND COMMUNICATION II <i>Prerequisite: DN 111</i> Required of first year students in the School of Design. Studies designed to increase perceptual awareness and communication skills through exercises in various communications media. Special nine-week session: 1300-1600 MWF	2 Mr. Randle
DN 212	VISUAL COMMUNICATION II <i>Prerequisite: DN 211</i> Required of second year students in the School of Design. Visual communications processes as they support design activities. Two- and three-dimensional studies as related to conceptual and definitive aspects of the design process. Exercises aimed at developing a mastery of both technical and nontechnical methods of visual communication. Special nine-week session: 1300-1600 MWF	2 Mr. Randle

## Economics

EC 205	ECONOMIC ACTIVITY An introductory study of economic activity with emphasis on national economic problems. Both Sessions: 0730-0900, 0800-0930, 0950-1120, 1140-1310	3 Staff
--------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------



EC 206	THE PRICE SYSTEM	3
	An introductory study of the determination of prices, wages and value; an analysis of the process and principles by which an economy allocates resources.	
	Both Sessions: 0800-0930, 0950-1120	Staff
EC 301	PRODUCTION AND PRICES	3
	<i>Prerequisite:</i> EC 206 or EC 212	
	An intensive study of the functioning of the market economy. An examination of the role of prices in determining the allocation of resources, the functioning of the firm in the economy, and forces governing the production of economic goods.	
	Both Sessions: 0800 0930	Staff
EC 302	NATIONAL INCOME AND ECONOMIC WELFARE	3
	<i>Prerequisite:</i> EC 205	
	An intensive examination of factors determining the national income. The economic and social effects of the level, composition and distribution of national income will be studied with reference to theories of economic welfare and to public policy.	
	Both Sessions: 0950-1120	Messrs. Williamson, Jones
EC 310	ECONOMICS OF THE FIRM	3
	<i>Prerequisite:</i> EC 205 or EC 206 or EC 212	
	An examination of the economic setting within which the business firm makes decisions, and an application of economic analysis to these decisions. Economics from the focal point of managerial decision-making.	
	First Session: 0800 0930	Mr. Williamson
	Second Session: 0950-1120	Mr. Jones
EC 312	ACCOUNTING I	3
	Introductory and problem materials designed to provide an understanding of accounting data, its accumulation and measurements as a tool of applied economics and its employment by management.	
	Both Sessions: 0800 0930, 0950-1120	Staff
EC 313	ACCOUNTING II	3
	<i>Prerequisite:</i> EC 312	
	A second-semester course in accounting with emphasis on managerial use in decision-making. Concepts and methods pertinent to the accumulation, organization and interpretation of data useful in evaluating, planning and controlling the performances of the business enterprise.	
	Second Session: 1140-1310	Mr. Ennis
EC 317	INTRODUCTION TO METHODS OF ECONOMIC ANALYSIS	3
	<i>Prerequisite:</i> EC 301	
	This course treats the fundamentals of quantitative methods and economic models in the application to economic and industrial problems. Through the study of economic variables and their parameters this course lays the ground work for later study of firm and consumer behavior.	
	Second Session: 0950-1120	Mr. Lillard

EC 402	FINANCIAL INSTITUTIONS	3
	<i>Prerequisite: EC 302</i>	
	An examination of the flow-of-funds among the principal financial institutions in the American economy; the behavior of the money and capital markets; and the allocation of savings flows into investment expenditures.	
	Second Session: 1140-1310	Mr. Jones
EC 407	BUSINESS LAW I	3
	<i>Prerequisite: EC 205, EC 206 or EC 212</i>	
	A course dealing with elementary legal concepts, contracts, agency, negotiable instruments, sales of personal property and insurance. Uniform commercial code considered under all titles applicable.	
	Roth Sessions: 0800-0930, 0950-1120	Miss Hunt, Messrs. Pinna, Sandman
EC 408	BUSINESS LAW II	3
	<i>Prerequisite: EC 407</i>	
	Deals with real property, bailments, partnerships, corporations, chattel mortgages, mortgages on real estate, landlord and tenant, insurance, wills, suretyship, conditional sales and bankruptcy. Uniform commercial code considered under all titles applicable.	
	First Session: 0950-1120	Miss Hunt
EC 409	INTRODUCTION TO PRODUCTION COST	3
	<i>Prerequisite: EC 312</i>	
	An introduction to accounting for manufacturing, fabrication and construction-type enterprises. The determination and allocation of costs of materials, labor and overhead. Special emphasis is placed on managerial analysis, interpretation and control of cost data.	
	Second Session: 0950-1120	Mr. Ennis
EC 411	MARKETING METHODS	3
	<i>Prerequisite: EC 205, EC 206 or EC 212</i>	
	Marketing institutions and their functions and agencies: retailing, market analysis, problems in marketing.	
	First Session: 1140-1310	Mr. Baker
EC 414	TAX ACCOUNTING	3
	<i>Prerequisite: EC 312</i>	
	An analysis of the Federal tax laws relating to the individual and business. Determining and reporting income. Payroll taxes and methods of reporting them. Actual practice in the preparation of income tax returns.	
	First Session: 0800-0930	Mr. Pinna
EC 420	CORPORATION FINANCE	3
	<i>Prerequisites: EC 205, EC 312</i>	
	Financial instruments and capital structure; procuring funds; man-	

- aging working capital; managing corporate capitalization; financial institutions and their work.  
First Session: 0950-1120 Mr. Reinoso
- EC 425 INDUSTRIAL MANAGEMENT 3  
*Prerequisite: Junior standing*  
Principles and techniques of modern scientific management; relation of finance, marketing, industrial relations, accounting and statistics to production planning and control; analysis of economic, political and social influences on production.  
Second Session: 0950-1120 Staff
- EC 426 PERSONNEL MANAGEMENT 3  
*Prerequisite: Junior standing*  
The scientific management of manpower, from the viewpoint of the supervisor and the personnel specialists. A study of personnel policy and a review of the scientific techniques regarding the specific problems of employment, training, personnel actions, employee service and joint relations.  
First Session: 0800-0930, 0950-1120 Mr. Wood  
Second Session: 0800-0930 Mr. Szal
- EC 432 INDUSTRIAL RELATIONS 3  
*Prerequisite: EC 205 or EC 212*  
A study of the origin of unions and the evolution of public policy in labor relations. An analysis of basic labor law, collective bargaining, and the problems of operating under a labor contract.  
Second Session: 1140-1310 Mr. Baker
- EC 448 INTERNATIONAL ECONOMICS 3  
*Prerequisites: EC 205, EC 206 or EC 212*  
A study of international economics, including trade, investment, monetary relations and certain aspects of economic development. Emphasis upon analytical and policy approaches, although some institutional material is included.  
First Session: 0730 0900 Mr. Ball
- EC 490 SENIOR SEMINAR IN ECONOMICS 3  
*Prerequisites: EC 301, EC 302*  
The terminal course in undergraduate study of economics. The student is assisted in summarizing his training, and in improving his capacity to recognize problems and to select logically consistent means of solving problems. This is done on a small group and individual basis.  
First Session: 1140 1310 Staff
- EC 501 PRICE THEORY 3  
*Prerequisite: EC 301*  
An intensive analysis of the determination of prices and of market behavior, including demand, cost and production, pricing under competitive conditions, and pricing under monopoly and other imperfectly competitive conditions.  
Second Session: 0800-0930 Staff

- EC 502 INCOME AND EMPLOYMENT THEORY 3  
*Prerequisite: EC 502*  
 A study of the methods and concepts of national income analysis with particular reference to the role of fiscal and monetary policy in maintaining full employment without inflation.  
 First Session: 0800-0930 Mr. Wilson
- EC 535 SOCIAL SCIENCE CONCEPTS IN MANAGERIAL PROCESSES 3  
*Prerequisite: Six hours in economics*  
 Interrelationships between concepts from economics and from other social sciences in managerial processes of clarifying goals, discovering alternatives and choosing courses of action. Cases are used to provide opportunities to compare contributions of theoretical concepts from economics, political science, social psychology, sociology and management science to managerial processes. Theoretical concepts are drawn from readings in the various disciplines.  
 First Session: 1140-1310 Staff
- EC 590 SPECIAL ECONOMICS TOPICS 3  
*Prerequisite: Consent of instructor*  
 An examination of current problems in economics organized on a lecture-discussion basis.  
 First Session: Topic—Political Economy and American Capitalism. A comparison of conflicting economic philosophies regarding the appropriate role of government in the American economic system.  
 Second Session: Topic — Regional Economic Development. Primarily a study of resource development with emphasis on regional economic development. Consideration will be given to problems of less developed countries.  
 First Session: 0950-1120 Mr. Wilson  
 Second Session: 0950-1120 Mr. Olsen
- EC 598 TOPICAL PROBLEMS IN ECONOMICS 1-6  
*Prerequisite: Consent of instructor*  
 An investigation of topics of particular interest to advanced students under the direction of a faculty member on a tutorial basis. Content will vary with the needs of students.  
 Both Sessions: Hours Arranged Staff
- EC 642 CONSUMPTION, DEMAND AND MARKET INTERDEPENDENCY 3  
*Prerequisites: EC 601, ST 513*  
 An analysis of the behavior of individual households and of consumers in the aggregate with respect to consumption of agricultural products; the impact of these decisions on demand for agricultural resources; the competition among agricultural regions and for markets; and the interdependence between agriculture and other sectors of the economy. Special eight and one-half week session (June 3-July 30): Hours Arranged Mr. King

EC 650	ECONOMIC DECISION THEORY	3
	<i>Prerequisite: EC 501 or equivalent, EC 550 or EC 555</i>	
	Study of general theories of choice. Structure of decision problems, the role of information; formulation of objectives. Current research problems.	
	Special eight and one half week session (June 3 July 30):	
	Hours Arranged	Mr. Carlson
EC 699	RESEARCH IN ECONOMICS	Credits Arranged
	<i>Prerequisite: Graduate standing</i>	
	Individual research in economics, under staff supervision and direction.	
	Both Sessions: Hours Arranged	Staff

## Education

ED 203	INTRODUCTION TO TEACHING MATHEMATICS AND SCIENCE	2
	A course designed to aid prospective teachers in becoming familiar with the scope and purposes of secondary education, the qualifications and responsibilities of teachers, the relation of the school to the community and problems of secondary school teachers.	
	First Session: 0800-0930 MTWT	Mr. Waters
ED 304 (PHI 304)	PHILOSOPHY OF EDUCATION	3
	The function of this course is to examine certain so called theories of education, to evaluate their assumptions and conclusions, and to attempt to understand their crucial terms. The course also seeks to explore philosophically the ends, goals and norms of education.	
	First Session: 0950-1120, 1140-1310	Mr. Bryan
	Second Session: 0950-1120, 1140-1310	Mr. Middleton
ED 327	HISTORY AND PHILOSOPHY OF INDUSTRIAL AND TECHNICAL EDUCATION	3
	<i>Prerequisite: ED 100</i>	
	Historical study of trade and technical education movement. Place, function and changing concepts of industrial and technical education in American education. Economic, sociological and psychological aspects.	
	First Session: 0800-0930	Mr. Shore
ED 344	SECONDARY EDUCATION	3
	<i>Prerequisite: Junior standing</i>	
	An overview of secondary education, including development, problems, services, trends, teaching profession, role of school in the community; purposes and objectives; the development and status of secondary education in North Carolina.	
	First Session: 0800-0930	Staff
	Second Session: 1100-1230	Mr. Thompson
ED 405	INDUSTRIAL AND TECHNICAL EDUCATION SHOP AND LABORATORY PLANNING	3
	<i>Prerequisites: Senior standing, six hours of drawing and design</i>	
	Principles and techniques to assist teachers in planning and organiz	

ing shop and laboratory facilities. Problems of locating and equipping vocational schools; the planning and layout of shops and related technology laboratories and classrooms. Individual and group assignments on planning and layout of postsecondary school buildings.  
 First Session: 0950-1120 Mr. Miller

- ED 411 STUDENT TEACHING IN AGRICULTURE 6  
*Prerequisite: Consent of instructor*  
 For Provisional "A" teachers of Vocational Agriculture only. Includes classwork, laboratory experience, fieldtrip, work with experienced teachers and individual planning of teaching program.  
 Special three-week session (July 12-July 30): Hours Arranged  
 Mr. Mercer
- ED 421 PRINCIPLES AND PRACTICES IN INDUSTRIAL COOPERATIVE TRAINING 3  
*Prerequisites: ED 327, ED 344*  
 A study of the development, objectives and principles of industrial cooperative training. The organization, promotion and management of programs in this area of vocational education.  
 First Session: 0800-0930 Mr. Smith
- ED 422 METHODS OF TEACHING INDUSTRIAL SUBJECTS 3 or 4  
*Prerequisites: ED 344, PSY 304*  
 A study of effective methods and techniques of teaching industrial subjects. Emphasis is given to class organization; student-teacher planning; methods of teaching manipulative skills and related information; lesson planning; shop safety; and evaluation. Teaching problems will be studied and analyzed following directed observations in the public schools.  
 First Session: 0800-0930 Mr. Miller
- ED 428 ORGANIZATION OF RELATED STUDY MATERIALS 3  
*Prerequisites: ED 327, ED 344*  
 The principles of selecting and organizing both technical and general related instructional material for trade extension and industrial cooperative training classes.  
 First Session: 0950-1120 Mr. Smith
- ED 503 THE PROGRAMMING PROCESS IN ADULT EDUCATION 3  
*Prerequisites: ED 501, consent of instructor*  
 The principles and processes involved in programming, including basic theories and concepts supporting the programming process. Attention will be given to the general framework in which programming is done, the organization needed, and the program roles of both professional and lay leaders.  
*Students desiring to take a special three-week course must register through the Department of Adult and Community College Education. Special applications may be obtained from Dr. Robert J. Dolan, Professor of Adult and Community College Education, 310 Poe Hall. Students must use this special application rather than register through regular procedures. Applications must be submitted by Friday, June 4.*  
 Special three-week session (June 21-July 9): 0900-1200 Mr. Shearon

- ED 504 PRINCIPLES AND PRACTICES OF INTRODUCTION TO VOCATIONS 3  
*Prerequisites: Twelve hours education*  
 This course is designed for teachers of Introduction to Vocations in the public schools. Emphasis will be placed on the IV program in the overall school curriculum, special methods of instruction, use of teaching aids and use of student evaluation instruments.  
 First Session: 1340-1510 Messrs. Cox, Hopke
- ED 505 PUBLIC AREA SCHOOLS 3  
*Prerequisite: Graduate standing*  
 Junior and community colleges, technical institutes, vocational schools and branches of universities: their development, status and prospects: policy and policy-making clientele, purposes, evaluation programs, personnel, organization, administration, financing, facilities, research and development functions.  
*Students desiring to take a special three week course must register through the Department of Adult and Community College Education. Special applications may be obtained from Dr. Robert J. Dolan, Professor of Adult and Community College Education, 310 Poe Hall. Students must use this special application rather than register through regular procedures. Applications must be submitted by Friday, June 4.*  
 Special three-week session (June 21-July 9): 1300-1600 Mr. Griffith
- ED 506 EDUCATION OF EXCEPTIONAL CHILDREN 3  
*Prerequisites: Six hours education or psychology*  
 Discussion of principles and techniques of teaching the exceptional child with major interest on the mentally handicapped and slow learner. Opportunity for individual work with an exceptional child will be provided.  
 Second Session: 0800-0930 Mrs. McCutchen
- ED 507 ANALYSIS OF READING ABILITIES 3  
*Prerequisites: Six hours education or psychology*  
 A study of tests and techniques in determining specific abilities; a study of reading retardation and factors underlying reading difficulties.  
 First Session: 0800-0930 Mr. Rust
- ED 508 IMPROVEMENT OF READING ABILITIES 3  
*Prerequisites: Six hours education or psychology*  
 A study of methods used in developing specific reading skills or in overcoming certain reading difficulties; a study of methods used in developing pupil vocabularies and word analysis skills; a study of how to control vocabulary burden of reading material.  
 First Session: 0950-1120 Mr. Rust
- ED 510 ADULT EDUCATION: HISTORY, PHILOSOPHY, CONTEMPORARY NATURE 3  
*Prerequisite: Graduate standing*  
 A study of the historical and philosophical foundations of adult education from ancient times to the present, giving attention to key figures, issues, institutions, movements and programs including con-

sideration of the relationship between adult education's historical development and prevailing intellectual, social, economic and political conditions. Consideration of adult education's contemporary nature, present day schools of thought on its objectives, and trends. Examination of the relationship between means and ends in adult education.  
 First Session: Hours Arranged Mr. Russell

- ED 519 EARLY CHILDHOOD EDUCATION 3  
*Prerequisites: PSY 475 or PSY 576*  
 This course is concerned with the planning, selection and utilization of human resources, activities, materials and facilities relating to the education of young children. Emphasis on student observation, participation, and evaluation of educational experiences appropriate for the developmental level of individual children, including flexible grouping, curricula planning and instructional techniques for an optimum learning environment. A synthesis of the student's knowledge of human development, learning theory and research findings as related to classroom application.  
 Second Session: 0950-1120 Mrs. McCutchen
- ED 520 PERSONNEL AND GUIDANCE SERVICES 3  
*Prerequisites: Six hours education or psychology*  
 An introduction to the philosophies, theories, principles and practices of personnel and guidance services.  
 Both Sessions: 0950-1120 Mrs. Parramore
- ED 524 OCCUPATIONAL INFORMATION 3  
*Prerequisites: Six hours education or psychology, ED 520 or equivalent*  
 To give teachers and counselors an understanding of how to collect, classify, evaluate and use occupational and educational information.  
 First Session: 0730-0900 Mr. Clary
- ED 525 TRADE ANALYSIS AND COURSE CONSTRUCTION 3  
*Prerequisites: ED 344, PSY 304*  
 Principles and practices in analyzing occupations for the purpose of determining teaching content. Practice in the principles underlying industrial course organization based on occupational analysis covering instruction in skills and technology and including course outlines, job sequences, the development of industrial materials and instructional schedules.  
 First Session: 0950-1120 Mr. Shore
- ED 527 PHILOSOPHY OF INDUSTRIAL AND TECHNICAL EDUCATION 3  
*Prerequisites: ED 422, ED 440*  
 A presentation of the historical development of industrial and technical education; the types of programs, philosophy, trends and problems of vocational-industrial education; study of federal and state legislation pertaining to industrial education, practical nurse education and technical education.  
 First Session: 0800-0930 Mr. Nerden



- ED 529 CURRICULUM MATERIALS DEVELOPMENT 3  
*Prerequisite: ED 525*  
 Selection and organization of curricula used in vocational-industrial and technical education; development of curricula and instructional materials.  
 Second Session: 0950-1120 Mr. Hanson
- ED 530 GROUP GUIDANCE 3  
*Prerequisites: Six hours education or psychology, ED 520 or equivalent*  
 To help teachers, counselors, administrators and others who are responsible for group guidance activities, to understand the theory and principles of effective group work.  
 First Session: 0950-1120 Mr. Morehead
- ED 533 ORGANIZATION AND ADMINISTRATION OF GUIDANCE SERVICES 3  
*Prerequisites: Graduate standing, ED 520 or equivalent*  
 For school guidance counselors, prospective counselors, personnel and guidance directors and school administrators. The philosophy and scope of guidance and personnel services; the functions and responsibilities of personnel involved; basic principles and current practices in planning, developing, operating and supervising guidance and personnel services will be studied.  
 First Session: 1140-1310 Mr. Morehead
- ED 535 STUDENT PERSONNEL WORK IN HIGHER EDUCATION 3  
*Prerequisites: Nine hours psychology or consent of instructor*  
 Examines current practices in various areas of student personnel work; studies both structure and functions of personnel programs in higher education.  
 First Session: 0800-0930 Mr. Frazier
- ED 542 CONTEMPORARY APPROACHES IN THE TEACHING OF SOCIAL STUDIES 3  
*Prerequisites: Advanced undergraduate or graduate. Must have completed student teaching*  
 An analysis of the principles, strategies and applications of new teaching approaches. Team-teaching, programmed instruction, inductive and reflective oriented teaching, role-playing, simulation and gaming, independent study, and block-time organization will be explored.  
 Second Session: 0800-0930 Mr. Thompson
- ED 554 PLANNING PROGRAMS IN AGRICULTURAL EDUCATION 3  
*Prerequisite: ED 411 or equivalent*  
 Theory of planned change in relation to educational programs. Objectives and evaluation of occupational education programs, including the place of agriculture. Role of the teacher in planning local programs. This class designed especially for Provisional A Teachers who have had ED 411.  
 Special three-week session (June 18-July 8) : 0900-1200 Mr. Mercer



sor of Adult and Community College Education, 310 Poe Hall. Students must use this special application rather than register through regular procedures. Applications must be submitted by Friday, June 4. Special three week session (June 21-July 9) : 1300 1600 Mrs. Brown, Mr. Flowers

- ED 596(B) TOPICAL PROBLEMS IN ADULT EDUCATION (SUPERVISION IN ADULT EDUCATION) 3  
 Designed for supervisors in Cooperative Extension and other adult education agencies. Includes basic concepts and principles useful to supervisors and professional adult educators: review of relevant research and current literature related to program and personnel supervision with emphasis on motivation, counseling and performance review.  
*Students desiring to take a special three-week course must register through the Department of Adult and Community College Education. Special applications may be obtained from Dr. Robert J. Dolan, Professor of Adult and Community College Education, 310 Poe Hall. Students must use this special application rather than register through regular procedures. Applications must be submitted by Friday, June 4. Special three-week session (June 21-July 9) : 1300-1600*  
 Mr. Van Dersal
- ED 596(C) TOPICAL PROBLEMS IN ADULT EDUCATION (CONCEPTS, PRINCIPLES AND TECHNIQUES OF DEVELOPING AND ADMINISTERING YOUTH PROGRAMS) 3  
 This course is designed for professional adult educators who have primary responsibility for developing and administering youth programs at state, county and community levels. Particular attention is given to the identification and utilization of behavioral science concepts and principles relevant to understanding the social and psychological needs of youth, the recruitment and training of volunteer leaders for work with youth and the development of informal educational programs for youth in a voluntary context.  
*Students desiring to take a special three-week course must register through the Department of Adult and Community College Education. Special applications may be obtained from Dr. Robert J. Dolan, Professor of Adult and Community College Education, 310 Poe Hall. Students must use this special application rather than register through regular procedures. Applications must be submitted by Friday, June 4. Special three-week session (June 21-July 9) : 1300 1600* Mr. Boyce
- ED 597 SPECIAL PROBLEMS IN EDUCATION 3  
*Prerequisites: Graduate standing, consent of instructor*  
 Opportunities for those interested in occupations to study current problems under the guidance of the staff.  
 First Session: 1520-1650 Mr. Bryant
- ED 600 THEORY OF ORGANIZATION AND ADMINISTRATION IN ADULT EDUCATION I 3  
*Prerequisites: ED 503, PS 502, SOC 541*  
 Theory of organization relating to adult education social systems as a basis for understanding administrative behavior. An in-depth analysis

of the structure, function and process of adult education social systems, patterns of organizational growth and change, behavior patterns of functionaries, and reciprocal influence of the adult education system and other social systems in the society.

First Session: 0950-1120

Mr. Dolan

- ED 601    THEORY OF ORGANIZATION AND ADMINISTRATION IN ADULT EDUCATION II    3  
*Prerequisite: ED 600 or a comparable course(s) on organizational theory*  
Philosophy of administration as a basis for administering an adult education institution. Theory relevant to administration of such an organization. Principles of administration as they relate to planning, organizing, staffing, initiating, delegating, integrating, motivating, decision-making, communicating, establishing standards, financing and budget defense and control, and measuring results. Administrative behavior of the adult education executive.  
*Students desiring to take a special three-week course must register through the Department of Adult and Community College Education. Special applications may be obtained from Dr. Robert J. Dolan, Professor of Adult and Community College Education, 310 Poe Hall. Students must use this special application rather than register through regular procedures. Applications must be submitted by Friday, June 4. Special three-week session (June 21-July 9): 1300-1600*    Mr. Boone  
Second Session: 1340-1510    Mr. Adams
- ED 611    LAWS, REGULATIONS AND POLICIES AFFECTING VOCATIONAL EDUCATION    3  
*Prerequisites: ED 527, ED 610 or equivalent*  
A detailed study of legislation (national and state) which applies directly to vocational education. Basic social and economic issues which precipitated the legislation are studied in depth; also the socio-economic impact of the legislation is reviewed. Emphasis is placed upon the organizational structure and the operating policies under which national and state legislation is converted into programs of vocational and technical education.  
First Session: 0950-1120    Mr. Nerden
- ED 615    INTRODUCTION TO EDUCATIONAL RESEARCH    3  
*Prerequisite: PSY 535 or equivalent*  
The course is designed to assist the student in understanding the meaning and purpose of educational research; and to develop the student's ability to identify educational problems, and to plan and carry out research to solve these problems.  
First Session: 1300-1600 MTh    Mr. Brown  
Second Session: 1300-1600 MTh    Mr. Morgan
- ED 630    PHILOSOPHY OF INDUSTRIAL ARTS    2  
*Prerequisites: Twelve hours in education*  
Required of all graduate students in industrial arts education  
Current and historical developments in industrial arts; philosophical concepts, functions, scope, criteria for the selection and evaluation of

- learning experiences, laboratory organization, student personnel program, community relationships, teacher qualifications and problems confronting the industrial arts profession. ED 692 is taken concurrently.  
First Session: 0800-0900 Mr. Olson
- ED 633      TECHNIQUES OF COUNSELING      3  
*Prerequisites: Nine hours economics, education, psychology or sociology*  
To aid the personnel worker in developing an understanding of and skill in counseling techniques; philosophies, theories, principles and practices of counseling will be considered.  
First Session: 0730-0900      Messrs. Hopke, Woodbury
- ED 641      LABORATORY AND PRACTICUM EXPERIENCES IN COUNSELING      3  
*Prerequisite: Advanced graduate standing, consent of instructor*  
A practicum course in which the student participates in actual counseling experience under supervision.  
First Session: 0800-0930, 0950 1120      Mr. Anderson
- ED 665      SUPERVISING STUDENT TEACHING      3  
*Prerequisite: Twelve hours in education*  
A study of the program of student teaching in teacher education. Special consideration will be given the role of the supervising teacher, including the following areas: planning for effective student teaching, observation and orientation, school community study, analysis of situation, evaluating student teachers and coordination with North Carolina State University.  
Special three-week session (June 4 June 22): 0800-0930      Mr. Speece
- ED 666      SUPERVISION OF COUNSELING      3  
*Prerequisite: Consent of instructor*  
A supervised practicum for doctoral students in assisting with the supervision of first year students in laboratory and practicum experiences in counseling.  
First Session: Hours Arranged      Mr. Anderson  
Second Session: Hours Arranged      Messrs. Hopke, Woodbury
- ED 692      SEMINAR IN INDUSTRIAL ARTS EDUCATION      1  
*Prerequisite: Graduate standing*  
Reviews and reports on special topics of interest to students in industrial arts education.  
First Session: 0800-0900      Mr. Olson
- ED 695      SEMINAR IN SCIENCE EDUCATION      2  
*Prerequisite: Departmental major or consent of instructor*  
A critical analysis of issues, trends and recent developments in science education.  
Both Sessions: 1330-1500      Mr. Shannon

ED 699	RESEARCH	Credits Arranged
	<i>Prerequisites: Fifteen hours, consent of adviser</i>	
	Individual research on a specific problem of concern to the student.	
	Both Sessions: Hours Arranged	Graduate Staff

## Electrical Engineering

EE 202	ELECTRIC CIRCUITS II	4
	<i>Prerequisites: EE 201, MA 201</i>	
	A continuation of EE 201. Circuit analysis by complex frequency. Introduction to two-port networks and polyphase circuits. Problem drill and laboratory exercises. (Offered only in a 12-week sequence. The course counts for two semester hours in calculating loads for each session. Students should register for four semester hours at registration for first session only.)	
	Both Sessions: LR 0800-0900, 0910-1010; LB 1340-1550 MW or TT	Mr. Seagraves
EE 213	ELECTRIC CIRCUITS I LAB	1
	<i>Prerequisite: EE 211</i>	
	First Session: LB 1340-1550 TT	Staff
EE 332	PRINCIPLES OF ELECTRICAL ENGINEERING	3
	<i>Prerequisite: EE 331</i>	
	A continuation of EE 331.	
	First Session: LR 0730-0900; LB 1340-1620 MW or TT	Staff
EE 350	ELECTRIC POWER UTILIZATION IN MANUFACTURING PROCESSES	3
	<i>Prerequisites: PY 212, MA 201</i>	
	Not available to undergraduates in electrical engineering	
	Introduction to basic electrical theory; d-c and a-c circuits and measurements; study of d-c motors and of single-phase and polyphase utilization equipment; basic control systems and brief introduction to principles of automatic control. Application examples will be drawn from the technologies of particular interest to the students in the class.	
	First Session: LR 0910-1010; LB 1340-1550 TT	Mr. Easter
EE 540	ELECTROMAGNETIC FIELDS AND WAVES	3
	<i>Prerequisites: EE 304, B average in EE and MA</i>	
	Laws and concepts of static electromagnetism. Fundamental equations and their applications. Fundamentals, forms and applications of Maxwell's equations. Vector and scalar potentials, relativistic aspects of fields, energy and power. Waves in unbounded and bounded regions, radiation, waveguides and resonators.	
	First Session: 0950-1120	Mr. Tischer
EE 643	ADVANCED ELECTRICAL MEASUREMENTS	3
	<i>Prerequisite: EE 431</i>	
	A critical analysis of circuits used in electrical measurements, with	

special attention to such topics as balance convergence, effects of strays, sensitivity, the use of feedback in electronic devices, automatic measuring systems and digital measuring systems.

First Session: Hours Arranged

Mr. Hoadley

EE 699	ELECTRICAL ENGINEERING RESEARCH	Credits Arranged
	<i>Prerequisites: Graduate standing in electrical engineering, consent of adviser</i>	
	Both Sessions: Hours Arranged	Graduate Staff

## Engineering (General Courses)

E 101	ENGINEERING GRAPHICS I	2
	The theory of graphically representing and solving spatial problems. Emphasis is placed on the development of a logical and analytical approach to problem solution. Conventional methods of graphically describing size and shape are introduced. Practical engineering situations are presented and the student arrives at an individual solution. First Session: 0730 0940, 1020-1230 Second Session: 0730-0940, 1020-1230	Staff
E 102	ENGINEERING GRAPHICS II	1
	<i>Prerequisite: E 101</i> The theory of graphically representing engineering data and then solving for any relationships that exist for that data. Material presented includes vector geometry, rate problems and graphical calculus. Engineering design situations are presented and the student arrives at an individual solution. First Session: 0730-0900	Staff
E 207	ENGINEERING GRAPHICS III	2
	<i>Prerequisite: E 101</i> A study of the current practices of communicating exact engineering information in the graphic medium. Production dimensioning, production characteristics, free hand sketching, production changes, and detail and assembly drawings will be covered. Special emphasis is placed on the use of the technical sketching. [The above will include standards and practices peculiar to mechanical, electrical (communication), construction, plant design and related fields.] First Session: 0730-1000	Staff

## Engineering Mechanics

EM 200	INTRODUCTION TO MECHANICS	3
	<i>Corequisite: MA 301</i> An introduction to the principles and concepts which form the basis for studies in dynamics, solid mechanics and fluid mechanics. The nature and properties of force systems and stress fields. The motion of particles and description of deformation of continuous media. The	

role of Newton's laws, the concepts of continuity and equilibrium, and the conservational principles in problems in mechanics.

Both Sessions: 0800-0930

Staff

- EM 205 PRINCIPLES OF ENGINEERING MECHANICS 3  
*Prerequisite: PY 205*  
*Corequisite: MA 202*  
Basic concepts, forces and equilibrium, distributed forces, virtual work, and inertial properties; application to mechanics, structures, and systems.  
Both Sessions: 0800-0930, 0950-1120 Staff
- EM 211 INTRODUCTION TO APPLIED MECHANICS 3  
*Corequisites: PY 212, MA 212*  
This course is intended to acquaint the student with the concepts of particle and rigid body mechanics. The fundamentals of equilibrium, kinematics and kinetics are applied to engineering problems.  
First Session: 0800-0930 Staff
- EM 212 MECHANICS OF ENGINEERING MATERIALS 3  
*Prerequisite: EM 211*  
This course constitutes a study of properties of engineering materials with special emphasis on the mechanical parameters. It is especially designed to prepare the student for the selection and specification of materials common to engineering practice. A particular emphasis is given to mechanical aspects of materials employed in design.  
Second Session: LR 0950-1120 MWF; LB 0950-1220 TT Staff
- EM 301 SOLID MECHANICS I 3  
*Prerequisite: EM 200*  
Introduction to the mechanics of deformable solids. Development of the equations which describe the linear elastic solid. Approximate solutions and solutions governed by the theory of elasticity to problems involving prescribed force systems, states of motion or energy inputs.  
Both Sessions: 0800-0930 Staff
- EM 303 FLUID MECHANICS I 3  
*Prerequisite: EM 200 or EM 205*  
Development of the basic equations of fluid mechanics in general and specialized form. Application of these specialized equations to a variety of topics including fluid statics, inviscid, incompressible fluid flow, and viscous, incompressible fluid flow.  
Both Sessions: 0800-0930, 0950-1120 Staff
- EM 305 ENGINEERING DYNAMICS 3  
*Prerequisite: EM 205*  
*Corequisite: MA 301*  
Equations of motion; kinematics, kinetics of mass points and systems of mass points; kinematics and kinetics of rigid bodies; dynamics of nonrigid systems.  
First Session: 0950-1120  
Second Session: 0800-0930 Staff



EM 307	MECHANICS OF SOLIDS	3
	<i>Prerequisite: EM 205</i>	
	<i>Corequisite: MA 301</i>	
	Stresses, strains, constitutive laws, yield and fracture; application to axial, bending, torsional and plane stress states; deflection and stability analyses.	
	Both Sessions: 0950-1120	Staff
EM 699	RESEARCH IN MECHANICS	Credits Arranged
	Both Sessions: Hours Arranged	

## English

ENG 100	REFRESHER ENGLISH	0
	A course for students deficient in English. Special attention will be given to individual problems in grammar, reading and writing.	
	First Session: 0800-0930, 0950-1120	Staff
ENG 111	COMPOSITION AND RHETORIC	3
	Required of all freshmen	
	Intensive study and practice in the basic forms and principles of expository communication; conferences.	
	First Session: 0800-0930, 0950-1120, 1140-1310	Staff
	Second Session: 0800-0930, 0950-1120	Staff
ENG 112	COMPOSITION AND READING	3
	Required of all freshmen	
	<i>Prerequisite: ENG 111</i>	
	Continued practice in expository writing; introduction to literary types; collateral reading; conferences.	
	First Session: 0800-0930, 0950-1120, 1140-1310	Staff
	Second Session: 0800-0930, 0950-1120	Staff
	<i>NOTE: The prerequisite for all advanced courses in writing, language, speech, or literature is the completion of 111 and 112 with a grade of C or better in at least one semester. Desirable preparation for literature courses of the 300 level or above is ENG 205 or any semester of ENG 261, 262 or 265, 266.</i>	
ENG 205	READING FOR DISCOVERY	3
	Selected masterworks drawn from American, English and European literature.	
	Both Sessions: 0800-0930, 0950 1120, 1140-1310	Staff
ENG 261	ENGLISH LITERATURE I (Beginnings to 1790)	3
	First Session: 0800-0930, 1140-1310	Staff
ENG 262	ENGLISH LITERATURE II (1790 to present)	3
	Second Session: 0800-0930, 1140-1310	Staff

ENG 265	AMERICAN LITERATURE I (Beginnings to 1850) First Session: 0950-1120, 1140-1310	3 Staff
ENG 266	AMERICAN LITERATURE II (1850 to present) Second Session: 0950-1120, 1140-1310	3 Staff
ENG 321	THE COMMUNICATION OF TECHNICAL INFORMATION Intensive training in the fundamentals of business and industrial expository and persuasive writing. First Session: 0950-1120 Second Session: 0800-0930	3 Mr. Dandridge Mr. Davis
ENG 346	COMPARATIVE LITERATURE I Selected great books ranging from the earliest Hebraic and Greek literature to the beginnings of the Renaissance. Second Session: 0950-1120	3 Mrs. Smoot
ENG 372	MODERN POETRY An introductory course with the objective of defining the "modern temper" by comparison of contemporary poetry with that of the past. Reading and analysis of individual poems. First Session: 1140-1310	3 Mr. Reynolds
ENG 399	CONTEMPORARY LITERATURE II (1940 to present) The study of representative French, American and British writers of the period 1940 to the present. Second Session: 1140-1310	3 Mr. Knowles
ENG 451	CHAUCER An undergraduate introduction to the study of Chaucer through an intensive reading of his masterpieces, <i>The Canterbury Tales</i> and <i>Troilus and Criseyde</i> . Second Session: 0950-1120	3 Mr. Toole
ENG 463	THE VICTORIAN PERIOD Major poets and selected prose writers studied against the social, economic, scientific and theological background of the century. First Session: 0800-0930	3 Mr. Hargrave
ENG 468	AMERICAN ROMANTICISM A study of major American writers from 1825 to 1865. First Session: 1140-1310	3 Mr. Stein
ENG 485	SHAKESPEARE A study of the principal plays with emphasis on the development of the playwright. First Session: 0950-1120	3 Mr. P. Williams

- ENG 526 HISTORY OF THE ENGLISH LANGUAGE 3  
*Prerequisite: Graduate standing or consent of instructor*  
 A survey of the growth and development of the language from its Indo-European beginnings to the present.  
 First Session: 0800-0930 Mr. Meyers
- ENG 575 SOUTHERN WRITERS 3  
*Prerequisite: ENG 266 or equivalent*  
 A survey of the particular contribution of the South to American literature, with intensive study of selected major figures.  
 Second Session: 1140-1310 Mr. Kincheloe
- ENG 578 ENGLISH DRAMA TO 1642 3  
*Prerequisite: ENG 261 or equivalent*  
 Intensive study of the English drama from the beginnings to 1642.  
 Second Session: 0800-0930 Mr. Toole

#### FOR GRADUATES ONLY

- ENG 608 BIBLIOGRAPHY AND METHODOLOGY 3  
*Prerequisite: Graduate standing*  
 A course intended to provide the student with the materials of literary research and scholarship, to introduce him to varying scholarly approaches to literary problems, and to develop his ability to evaluate and use with discrimination the work of scholars in his field.  
 First Session: 0950-1120 Mr. White
- ENG 650 19TH-CENTURY ENGLISH LITERATURE: THE ROMANTIC PERIOD 3  
*Prerequisite: Graduate standing*  
 An intensive study of the six major romantic poets, with attention to the political, social and literary background.  
 First Session: 0800-0950 Mr. P. Williams
- ENG 651 STUDIES IN CHAUCER 3  
*Prerequisite: ENG 451 or equivalent*  
 An intensive study of the Chaucer canon requiring independent research.  
 Second Session: 0950-1120 Mr. Koonce
- ENG 662 18TH CENTURY ENGLISH LITERATURE 3  
*Prerequisite: ENG 261 or equivalent*  
 The major figures in English literature between 1660 and 1790 against the background of social, cultural and religious change.  
 First Session: 1140-1310 Mr. White
- ENG 680B 20TH-CENTURY DRAMA (AMERICAN) 3  
*Prerequisite: Graduate standing*  
 An intensive study of the major 20th-century American playwrights.  
 Second Session: 0950-1120 Mr. Halpern

- ENG 699 RESEARCH IN LITERATURE (Thesis) Credits Arranged  
*Prerequisite: Consent of graduate adviser*  
 Independent investigation of an advanced literary or linguistic problem leading to the writing of a master's thesis.  
 Both Sessions: Hours Arranged Graduate Staff

## Entomology

- ENT 312 INTRODUCTION TO ECONOMIC INSECTS 3  
 A basic course covering the fundamentals of insect classification, development and habits. Emphasis will be on the relationships of insects to man and to the environment.  
 First Session: 0800-0930 Staff
- ENT 690 SPECIAL PROBLEMS Credits Arranged  
*Prerequisite: Consent of instructor, graduate standing*  
 Investigations on special problems in entomology not related to a thesis problem, but designed to provide experience and training in research.  
*Students desiring to take a special three-week course must register through the Department of Adult and Community College Education. Special applications may be obtained from Dr. Robert J. Dolan, Professor of Adult and Community College Education, 310 Pos Hall. Students must use this special application rather than register through regular procedures. Applications must be submitted by Friday, June 4.*  
 Special three-week session (June 21-July 9) : Hours Arranged  
 Mr. Weekman  
 Both Sessions: Hours Arranged Graduate Staff
- ENT 699 RESEARCH Credits Arranged  
*Prerequisite: Graduate standing in entomology or closely allied fields*  
 Original research in connection with thesis problem in entomology.  
 Both Sessions: Hours Arranged Graduate Staff

## Food Science

- FS 591 SPECIAL PROBLEMS IN FOOD SCIENCE Maximum 6  
*Prerequisite: Senior or graduate standing*  
 Analysis of scientific, engineering and economic problems of current interest in foods. The scientific appraisal and solution of a selected problem. The problems are designed to provide training and experience in research.  
*Students desiring to take a special three-week course must register through the Department of Adult and Community College Education. Special applications may be obtained from Dr. Robert J. Dolan, Professor of Adult and Community College Education, 310 Pos Hall. Students must use this special application rather than register through*

*regular procedures. Applications must be submitted by Friday, June 4.*  
Special three-week session (June 21-July 9): 0830-1130

Messrs. Aurand, Christian, Gilliland

Both Sessions: Hours Arranged Graduate Staff

FS 691 SPECIAL RESEARCH PROBLEMS IN FOOD SCIENCE Credits Arranged  
Directed research in a specialized phase of food science designed to  
provide experience in research methodology and philosophy.  
Both Sessions: Hours Arranged Graduate Staff

FS 699 RESEARCH IN FOOD SCIENCE Credits Arranged  
Original research preparatory to the thesis for Master of Science or  
Doctor of Philosophy degrees.  
Both Sessions: Hours Arranged Graduate Staff

## Forestry

FOR 204 SILVICULTURE 2  
Sophomore Summer Camp  
*Prerequisite: Junior standing in FOR*  
Both Sessions: 0800-1700 Mr. Duffield

FOR 263 DENDROLOGY 1  
Sophomore Summer Camp  
*Prerequisite: Junior standing in FOR*  
First Session: 0800-1700 Mr. Duffield

FOR 264 FOREST PROTECTION 2  
Sophomore Summer Camp  
*Prerequisite: Junior standing in FOR*  
Both Sessions: 0800-1700 Staff

FOR 274 MAPPING AND MENSURATION 4  
Sophomore Summer Camp  
*Prerequisite: FOR 272*  
First Session: 0800-1700 Messrs. Steensen, Bryant, Graduate  
Assistant

FOR 284 UTILIZATION 1  
Sophomore Summer Camp  
*Prerequisite: Junior standing in FOR*  
Both Sessions: 0800-1700 Staff

FOR 491 (WPS 491) SENIOR PROBLEMS IN FOREST  
RESOURCES Credits Arranged  
*Prerequisite: Consent of department*  
Both Sessions: Hours Arranged Staff

FOR 492 (WPS 492)	SENIOR PROBLEMS IN FOREST RESOURCES	Credits Arranged
	<i>Prerequisite: Consent of department</i>	
	Both Sessions: Hours Arranged	Staff
FOR 591	FORESTRY PROBLEMS	Credits Arranged
	<i>Prerequisite: Senior or graduate standing</i>	
	Both Sessions: Hours Arranged	Staff
FOR 692	ADVANCED FOREST MANAGEMENT PROBLEMS	Credits Arranged
	<i>Prerequisite: Graduate standing</i>	
	Both Sessions: Hours Arranged	Staff
FOR 699	PROBLEMS IN RESEARCH	Credits Arranged
	<i>Prerequisite: Graduate standing</i>	
	Both Sessions: Hours Arranged	Staff

## Genetics

### FOR UNDERGRADUATES

GN 301	GENETICS IN HUMAN AFFAIRS	3
	Fundamental principles of genetics will be presented at a level not requiring courses in biological sciences but sufficient for an understanding of the relation of genetics to society and technology. A survey will be given of current knowledge of inheritance of human traits.	
	First Session: 0800-0930	Mr. Bostian

### FOR ADVANCED UNDERGRADUATES

GN 411	THE PRINCIPLES OF GENETICS	3
	<i>Prerequisite: BS 100</i>	
	An introductory course. The physical and chemical basis of inheritance; genes as functional and structural units of heredity and development; qualitative and quantitative aspects of genetics variation.	
	First Session: 1140-1310	Mr. Bostian

### FOR GRADUATES ONLY

GN 695	SPECIAL PROBLEMS IN GENETICS	1-3
	<i>Prerequisites: Advanced graduate standing, consent of instructor</i>	
	Both Sessions: Hours Arranged	Graduate Staff
GN 699	RESEARCH	Credits Arranged
	<i>Prerequisite: Graduate standing, consent of adviser</i>	
	Both Sessions: Hours Arranged	Graduate Staff

## Geology

GY 220	PHYSICAL-HISTORICAL GEOLOGY	4
	Open to summer earth science institute participants only. First Session: LR 0800-1200 MWF, 0800-1000 TT; LB 1000 1200 TT	Staff
GY 486	WEATHER AND CLIMATE	2
	Open to summer earth science institute participants only. Second Session: 0800-1200	Staff
GY 593	ADVANCED TOPICS IN GEOLOGY	1-6
	<i>Prerequisite: Consent of staff</i> Special study of some advanced phases of geology. Both Sessions: Hours Arranged	Staff
GY 699	GEOLOGICAL RESEARCH	Credits Arranged
	<i>Prerequisite: Consent of instructor</i> Both Sessions: Hours Arranged	Graduate Staff

## History

HI 101	HISTORY OF CIVILIZATION (to 1650)	3
	A history of major civilizations from their ancient beginnings through modern eras. The evolution of significant political, economic, social, cultural and scientific ideas and institutions is stressed and emphasis is given to the interrelationships between European and other civilizations. The first semester covers to 1650, the second semester since that date. First Session: 0800-0930 Second Session: 0950-1120	Mr. Parramore Mr. Rotz
HI 102	HISTORY OF CIVILIZATION (since 1650)	3
	First Session: 0950-1120 Second Session: 0800-0930	Mr. Gran Mr. Rotz
HI 105	MODERN WESTERN WORLD	3
	Not open to students required to take HI 101 or HI 102. A history of major movements in the Western World from the Renaissance to the present. First Session: 0950-1120 Second Session: 0800-0930	Mr. Nixon Mr. Banker
HI 111	THE UNITED STATES THROUGH RECONSTRUCTION	3
	Not open to students who have had HI 241 or HI 242. A study of major historical developments in the growth of the American nation through the political phases of the Reconstruction period following the Civil War. First Session: 1140-1310 Second Session: 0800-0930	Mr. Elliott Mr. Seegers

- HI 112      THE UNITED STATES SINCE RECONSTRUCTION      3  
 Not open to students who have had HI 243 or HI 244.  
 A study of major historical developments in the growth of the American nation beginning with the economic and social phases of the Reconstruction period following the Civil War.  
 Both Sessions: 0950-1120      Miss Lemmon, Mr. Nixon  
*NOTE: The prerequisite for all 200-level courses is three hours of history or advanced placement.*
- HI 208      THE MIDDLE AGES      3  
 A study of the medieval civilization as it emerged from the declining Roman empire through its apogee in the 13th century.  
 First Session: 0800-0930      Mr. Riddle
- HI 209      RENAISSANCE TO WATERLOO 1300-1815      3  
 A survey of all aspects of the period of transition from the medieval to the modern world.  
 Second Session: 0950-1120      Mr. Banker
- HI 233      THE WORLD IN THE 20TH CENTURY      3  
 A study of national and international problems in the Western and non-Western world.  
 Both Sessions: 1140-1310      Mr. Gran, Mr. Suval
- HI 272      THE AFRO-AMERICAN IN AMERICA      3  
 After a brief consideration of his African background, the course considers the particular role, experience and influence of the Afro-American at various stages in the development of the United States.  
 First Session: 1140-1310      Mr. Caine
- HI 302      ROME TO 180 A.D.      3  
*Prerequisite: HI 101, 102 or equivalent with consent of instructor*  
 Tracing the development of Rome from the Etruscans through Emperor Marcus Aurelius (180 A.D.), this course examines critically the great political achievement which saw Rome rise from a cattle-town on the Tiber to the head of an Empire. This rise is examined through readings in Livy and Tacitus.  
 First Session: 1140-1310      Mr. Riddle
- HI 306      NORTH CAROLINA HISTORY      3  
*Prerequisite: HI 111, HI 112 or equivalent with consent of instructor*  
 A study of the history of North Carolina from the earliest period of exploration and colonization to the present.  
 First Session: 0800-0930      Miss Lemmon
- HI 344      THE UNITED STATES: REVOLUTION TO CONSTITUTION      3  
*Prerequisite: HI 111, HI 112 or equivalent with consent of instructor*  
 The historical steps in the establishment of the United States as an independent nation. The conflict with Great Britain after 1763 leading



to the declaring of independence; the war for American independence in its military and diplomatic aspects; the domestic problems; the foreign relations in the post-war years; the establishment of government in the new nation.

Second Session: 1140 1310

Mr. Seegers

- HI 352 ENGLISH HISTORY (Since 1688) 3  
*Prerequisite: HI 101, HI 102 or equivalent with consent of instructor*  
A study of the history of England from 1688 to the present, stressing the evolution of the English constitution and the political, social and economic background of English cultural development.  
First Session: 0950-1120 Mr. Parramore
- HI 356 GERMANY SINCE 1848 3  
*Prerequisite: HI 101, HI 102 or equivalent with consent of instructor*  
A history of Germany from the revolutions of 1848 to the present, concentrating on the problems of German nationalism and political and social reform.  
Second Session: 0800-0930 Mr. Suval

## Horticultural Science

- HS 441 FLORICULTURE I (Greenhouse Management) 3  
*Prerequisites: BS 100, SSC 200*  
A study of the economic status of greenhouse production, growing structure designs and construction materials, heating and cooling systems, growing media and sterilization, moisture control, nutrition, effects of light and temperatures on plant growth, atmosphere control, pest control, chemical growth regulators, and greenhouse management practices.  
*Students desiring to take a special three-week course must register through the Department of Adult and Community College Education. Special applications may be obtained from Dr. Robert J. Dolan, Professor of Adult and Community College Education, 310 Poe Hall. Students must use this special application rather than register through regular procedures. Applications must be submitted by Friday, June 4. Special three-week session (June 21-July 9): 0900-1200, 1400 1600*  
Mr. Love
- HS 599 RESEARCH PRINCIPLES Credits Arranged  
*Prerequisite: Consent of instructor*  
Investigation of a problem in horticulture. The students obtain practice in experimental techniques, critical review of literature and scientific writing.  
First Session: Hours Arranged Graduate Staff
- HS 699 RESEARCH Credits Arranged  
*Prerequisites: Graduate standing in horticulture, consent of advisory committee chairman*  
Both Sessions: Hours Arranged Graduate Staff

## Industrial Arts Education

- IA 203      TECHNICAL SKETCHING      2  
The application of drawing practices for the layman. Freehand sketching, pictorial representation, production sketches, template drawing, exploded views, shades and shadows; individual problems and selected graphic representation.  
Second Session: 1020-1120      Mr. Troxler
- IA 209      WOOD PROCESSING      4  
*Prerequisite: IA 102*  
This course is designed to provide an orientation to the processes of designing, developing and producing wood products through lectures, discussions and planned experiences in the various woodworking areas. Emphasis will be on planning and developing wood products in the industrial arts laboratory, together with an analysis of typical products and industrial practices. A research report will be required.  
Second Session: 0730-0940      Mr. Troxler
- IA 210      METAL TECHNOLOGY      4  
*Prerequisites: IA 102, IA 105*  
This course is designed to provide an orientation to the processes of designing, developing and producing metal products. Instruction will be given through lectures, discussions and planned experiences in the basic metal-working areas. Emphasis will be on planning and developing of metal products in the industrial practices. A research report will be required.  
First Session: 0730-0940      Mr. Engelke
- IA 306      GRAPHIC ARTS      4  
*Prerequisite: IA 102*  
An introduction to the basic printing areas of letterpress, offset, photography, silk screen and bookbinding with emphasis on course outline and subject matter for the secondary schools.  
First Session: 1340-1550      Mr. Bame
- IA 312      ELECTRICITY-ELECTRONICS      4  
*Prerequisites: PY 211, PY 212, or consent of instructor*  
A study of the principles of electricity and electronics, basic principles; AC and DC circuits; electrical machinery; and electronics, including power supplies, amplifiers, oscillators and tuned circuits. Applications and examples of the common experiences which the student encounters such as power and light circuits, motors, and controls, measuring and servicing instruments, power supplies, amplifiers, radios and electronic control circuits.  
Second Session: 0730-0940      Mr. Young



IE 332	MOTION AND TIME STUDY	4
	<i>Prerequisite: ST 361</i>	
	Principles and techniques of motion and time study; detailed study of charting operator movements; micromotion study.	
	First Session: LR 0800-0930; LB 1340-1620 MWF	Mr. Kamal
IE 420	MANUFACTURING CONTROLS	3
	<i>Prerequisite: IE 301</i>	
	Theory and methodology for developing and maintaining profitable manufacturing operations. Development of principles and procedures for control of materials, manpower and costs.	
	First Session: 0800-0930	Mr. Tucker
IE 443	QUALITY CONTROL	3
	<i>Prerequisite: ST 361</i>	
	Applications and analysis of statistical methods in process control, and acceptance sampling procedures.	
	Second Session: 0800-1000	Mr. Alvarez
IE 505 (MA 505, OR 505)	MATHEMATICAL PROGRAMMING I	3
	<i>Prerequisite: MA 405</i>	
	A rigorous and complete development of the theoretical and computational aspects of linear programming as well as discussion of applications.	
	Second Session: 0800-0930	Staff
IE 509 (OR 509)	DYNAMIC PROGRAMMING	3
	<i>Prerequisites: MA 405, ST 421</i>	
	An introduction to the theory and computational aspects of dynamic programming and its application to sequential decision problems.	
	Second Session: 0950-1120	Mr. Nuttle
IE 591	PROJECT WORK	2-6
	<i>Prerequisite: Graduate or senior standing</i>	
	Second Session: Hours Arranged	Mr. Anderson
IE 699	INDUSTRIAL ENGINEERING RESEARCH	Credits Arranged
	Both Sessions: Hours Arranged	Staff

## Materials Engineering

MAT 200	MECHANICAL PROPERTIES OF STRUCTURAL MATERIALS	2
	<i>Prerequisite: CH 105 and the first course in engineering mechanics</i>	
	The dependence of mechanical properties of structural materials on macro-, micro- and crystalline structure; control of structure through treatment.	
	First Session: LR 1100-1200 MWF; LB 1300-1730 TT	Staff

MAT 201	STRUCTURE AND PROPERTIES OF ENGINEERING MATERIALS I	3
	<i>Prerequisite: CH 103</i>	
	An introduction to the fundamental physical principles governing the structure and constitution of metallic and nonmetallic materials of construction, and the relation of these principles to the control of properties.	
	Both Sessions: LR 1200-1300; LB 1300-1600 MWF	Mr. Fahmy
MAT 495	EXPERIMENTAL ENGINEERING I	3
	<i>Prerequisite: Senior standing</i>	
	Advanced engineering principles applied to a specific project dealing with materials or general experimental work. A seminar period is provided and a written report required.	
	First Session: Hours Arranged	Staff
MAT 496	EXPERIMENTAL ENGINEERING II	3
	<i>Prerequisite: Senior standing</i>	
	Second Session: Hours Arranged	Staff
MAT 595	ADVANCED MATERIALS EXPERIMENTS I	3
	<i>Prerequisite: MAT 411</i>	
	Advanced engineering principles applied to a specific experimental project dealing with materials. A seminar period is provided and a written report is required.	
	First Session: Hours Arranged	Staff
MAT 596	ADVANCED MATERIALS EXPERIMENTS II	3
	<i>Prerequisite: MAT 411</i>	
	Second Session: Hours Arranged	Staff

## Mathematics

MA 2	REVIEW ALGEBRA	0
	First Session: 0730-0940	Staff
MA 102	ANALYTIC GEOMETRY AND CALCULUS I	4
	<i>Prerequisite: MA 111 or equivalent completed in high school</i>	
	The first of three semesters of a unified course in analytic geometry and calculus. Functions and graphs, limits, derivatives of algebraic functions and applications, indefinite integral, definite integral and the fundamental theorem of calculus, areas and volumes, plane analytic geometry.	
	Credit in both MA 102 and MA 112 is not allowed.	
	Both Sessions: 0730-0940, 1020-1230	Staff
MA 111	ALGEBRA AND TRIGONOMETRY	4
	Sets and logic, the real number system, polynomials, algebraic fractions, exponents and radicals, linear and quadratic equations, inequalities, functions and relations, logarithms, plane trigonometry.	

(Students in the schools of Engineering, PAMS, Design, and Departments of Agricultural Engineering and Mathematics Education who may be required to take this course will not receive credit hours for MA 111 toward the graduation requirements.)

Both Sessions: 0730-0940, 1020-1230

Staff

- MA 112 ANALYTIC GEOMETRY AND CALCULUS A 4  
*Prerequisite: MA 111 or equivalent completed in high school*  
A unified course in analytic geometry and calculus containing the following topics: the straight line; nonlinear equations and graphs; functions and limits; the derivative and its applications; anti-differentiation and integration. Applications to the social, life and behavioral sciences are included where possible.  
Credit in both MA 102 and MA 112 is not allowed.  
First Session: 0730-0940, 1020-1230  
Second Session: 1020-1230 Staff
- MA 114 TOPICS IN MODERN MATHEMATICS 3  
*Prerequisite: MA 111 or equivalent completed in high school*  
Introduction to the theory of sets, relations and functions with applications to Boolean algebra, logical inference, theory of probability, vector spaces and matrices.  
Both Sessions: 0800-0930 Staff
- MA 115 INTRODUCTION TO CONTEMPORARY MATHEMATICS I 3  
The number system and other scales of notation; algebraic operations; inequalities; sets, logic and Boolean algebra; logarithmic and trigonometric functions. The point of view is intuitive. Some emphasis is placed on the history of certain mathematical concepts and on the importance of mathematics in contemporary life.  
Credit in MA 115 is not allowed if student already has credit for MA 201 or MA 112 or MA 114.  
First Session: 1140-1310 Staff
- MA 116 INTRODUCTION TO CONTEMPORARY MATHEMATICS II 3  
*Prerequisite: MA 115*  
Permutations, combinations and the binomial theorem; probability; mathematical induction; the group as an example of a finite mathematical system; graphs of systems of linear inequalities and linear programming; solutions of linear systems by Cramer's rule and by matrix methods; introduction to analytic geometry and calculus.  
Credit in MA 116 is not allowed if the student already has credit in MA 201 or MA 212.  
Second Session: 1140-1310 Staff
- MA 201 ANALYTIC GEOMETRY AND CALCULUS II 4  
*Prerequisite: MA 102*  
The second of three semesters of a unified course in analytic geometry and calculus. Applications of the definite integral. Transcendental functions, methods of integration, polar coordinates, parametric equations, introduction to infinite series.  
Both Sessions: 0730-0940, 1020-1230 Staff

MA 202	ANALYTIC GEOMETRY AND CALCULUS III <i>Prerequisite: MA 201</i> The third of three semesters of a unified course in analytic geometry and calculus. Brief introduction to determinants and matrices, vector functions, analytic geometry of three dimensions and partial differentiation, multiple integration, applications. Line integral and Green's Theorem. Both Sessions: 0730-0940, 1020-1230	4      Staff
MA 212	ANALYTIC GEOMETRY AND CALCULUS B <i>Prerequisite: MA 112</i> A continuation of MA 112. Differentiation and integration of trigonometric, exponential and logarithmic functions, methods of integration, applications of the integral; functions of several variables; infinite series. Applications to social, life and behavioral sciences are included where possible. Second Session: 1140-1310	3      Staff
MA 231	INTRODUCTION TO LINEAR ALGEBRA <i>Prerequisite: MA 201</i> Vectors and vector spaces, linear transformations, linear equations, determinants, eigenvalues and quadratic forms. First Session: 0950-1120	3      Staff
MA 232	INTRODUCTION TO MULTIVARIABLE CALCULUS <i>Prerequisite: MA 231</i> Functions of several variables, limits, continuity, differentiability, Chain rule, implicit functions, multiple integrals. Second Session: 0950-1120	3      Staff
MA 301	APPLIED DIFFERENTIAL EQUATIONS I <i>Prerequisite: MA 202 or equivalent</i> First order equations, applications, linear equations of higher order, applications to mechanical and electrical systems, series solutions, special functions, Laplace transforms. Both Sessions: 0800-0930, 1140-1310	3      Staff
MA 312	INTRODUCTION TO DIFFERENTIAL EQUATIONS <i>Prerequisite: MA 231, MA 201</i> First order differential equations, basic theory and applications of linear equations. Systems of linear equations, matrix methods, series solutions, Laplace transforms, existence and uniqueness. Second Session: 0800-0930	3      Staff
MA 401	APPLIED DIFFERENTIAL EQUATIONS II <i>Prerequisite: MA 301</i> The wave, heat and Laplace equations. Solutions by separation of variables and expansion in Fourier Series or other appropriate orthogonal sets. Both Sessions: 0950-1120	3      Staff

MA 403	INTRODUCTION TO MODERN ALGEBRA	3
	<i>Prerequisite: One year of calculus</i>	
	Sets and mappings; equivalence relations; groups, homomorphisms, cosets, Cayley's theorem, symmetric groups, quotient groups; rings; integral domains; Euclidean algorithm; polynomial rings, ideals, quotient rings.	
	Second Session: 0800-0930	
MA 405	INTRODUCTION TO MATRICES AND LINEAR TRANSFORMATIONS	3
	<i>Prerequisite: One year of calculus</i>	
	Determinants, linear equations, linear transformations and matrices, operations with matrices, eigenvalues, introduction to bilinear and quadratic forms.	
	First Session: 0800-0930, 1140-1310	
	Second Session: 1140-1310	Staff
MA 421	INTRODUCTION TO PROBABILITY	3
	<i>Prerequisite: One year of calculus</i>	
	Axioms of probability, conditional probability, combinatorial analysis, random variables, expectation, simple stochastic processes.	
	First Session: 1140-1310	Staff
MA 425	MATHEMATICAL ANALYSIS I	3
	<i>Prerequisite: MA 232</i>	
	Real number system, functions and limits, topology on the real line, continuity, differential and integral calculus for functions of one variable.	
	First Session: 0800-0930	Staff
MA 426	MATHEMATICAL ANALYSIS II	3
	<i>Prerequisite: MA 425</i>	
	Infinite series, uniform convergence, calculus of several variables, topology in n-dimensions, limits, continuity, differentiability, implicit functions, multiple integrals, line and surface integrals.	
	Second Session: 0800-0930	Staff
MA 433	HISTORY OF MATHEMATICS	3
	<i>Prerequisite: One year of calculus</i>	
	Evolution of the number system; trends in the development of modern mathematics; lives and contributions of outstanding mathematicians.	
	Second Session: 0800-0930	Staff
MA 511	ADVANCED CALCULUS I	3
	<i>Prerequisite: MA 301</i>	
	Basic properties of the real numbers; continuous functions of one real variable; law of the mean; extreme values of functions; Taylor expansions of functions; reexamination of these concepts for functions of several variables; Lagrange multipliers; Jacobians; implicit-function theorems and transformations.	
	First Session: 0800-0930, 1140-1310	Staff



MA 512	ADVANCED CALCULUS II <i>Prerequisite: MA 511</i> The Riemann integral; line and surface integrals; divergence, curl and integral theorems; transformation of integrals; infinite series; uniform convergence; power series; improper integrals. Both Sessions: 0800-0930	3 Staff
MA 513	INTRODUCTION TO COMPLEX VARIABLES <i>Prerequisite: MA 511 or MA 426</i> Operations with complex numbers, derivatives, analytic functions, integrals, definitions and properties of elementary functions, multi-valued functions, power series, residue theory of applications, conformal mapping. First Session: 0950-1120	3 Staff
MA 514	METHODS OF APPLIED MATHEMATICS <i>Prerequisite: MA 511 or MA 425</i> Introduction to integral equations, the calculus of variations, and difference equations. Second Session. 0950-1120	3 Staff
MA 521	FUNDAMENTALS OF MODERN ALGEBRA <i>Prerequisite: MA 403</i> Groups, normal subgroups, quotient groups, Cayley's theorem, Sylow's theorem. Rings, ideals and quotient rings, polynomial rings. Fields, extension fields, elements of Galois theory. Second Session: 1140-1310	3 Staff
MA 524	MATHEMATICAL METHODS IN THE PHYSICAL SCIENCES I <i>Prerequisite: MA 405, MA 512</i> Green's functions and two point boundary value problems; elementary theory of distributions; generalized Green's functions. Finite and infinite dimensional inner product spaces; Hilbert spaces; completely continuous operators; integral equations; the Fredholm alternative; eigenfunction expansions; applications to potential theory. Nonsingular and singular Sturm-Liouville problems; Weil's theorem. First Session: 1140-1310	3 Staff
MA 527 (CSC 527)	NUMERICAL ANALYSIS I <i>Prerequisite: CSC 101 or CSC 111, MA 301 or MA 312, MA 231 or MA 405</i> Numerical solution of equations, introduction to the theory of errors, finite difference tables and the theory of interpolation, numerical integration, numerical differentiation and elements of difference calculus. Second Session: 0800-0930	3 Staff
MA 532	THEORY OF ORDINARY DIFFERENTIAL EQUATIONS <i>Prerequisites: MA 301, MA 405, advanced calculus</i> Existence and uniqueness theorems, systems of linear equations, fundamental matrices, matrix exponential, series solutions, regular singular points; plane autonomous systems, stability theory. Second Session: 1340-1510	3 Staff

MA 541 (ST 541)	THEORY OF PROBABILITY I	3
	<i>Prerequisite: MA 425 or MA 511</i>	
	Axioms, combinatorial analysis, conditional probability, independence, random variables, expectation special discrete and continuous distributions, probability and moment generating functions, central limit theorem, laws of large numbers, branching processes, recurrent events, random walk.	
	Special eight-week session (June 10-July 31): 1200-1300	Staff
MA 622	LINEAR TRANSFORMATIONS AND MATRIX THEORY	3
	<i>Prerequisite: MA 405</i>	
	Vector spaces, linear transformation and matrices, minimal polynomials, elementary divisors, canonical forms, functions of matrices, applications to systems of differential equations.	
	Special eight-week session (June 10-July 31): 0800-0900	Staff
MA 632	OPERATIONAL MATHEMATICS I	3
	<i>Prerequisite: MA 513 or MA 611</i>	
	Laplace transforms with theory and application to ordinary and partial differential equations arising from problems in engineering and physics.	
	Special eight-week session (June 10-July 31): 0910-1010	Staff
MA 681	SPECIAL TOPICS IN REAL ANALYSIS	1-6
	Special eight-week session (June 10-July 31): Hours Arranged	Staff
MA 683	SPECIAL TOPICS IN ALGEBRA	1-6
	Special eight-week session (June 10-July 31): Hours Arranged	Staff
MA 689	SPECIAL TOPICS IN APPLIED MATHEMATICS	1-6
	Special eight-week session: Hours Arranged	Staff
MA 699	RESEARCH	Credits Arranged
	Individual research in the field of mathematics	
	Both Sessions: Hours Arranged	Staff

## Mechanical and Aerospace Engineering

MAE 216	ELEMENTS OF MECHANICAL ENGINEERING	3
	<i>Prerequisites: EM 205, PY 208 or PY 206</i>	
	An introductory consideration of the scope and interests in mechanical engineering through the application and extension of chemistry, physics and mathematics to real engineering problems in analysis and design.	
	First Session: 0800-0930	Staff

MAE 250	INTRODUCTION TO AEROSPACE ENGINEERING	3
	<i>Prerequisite: PY 205</i>	
	Fundamental concepts underlying aerospace engineering. A basic study of the aerodynamics, structural, propulsion, performance and control requirements of flight vehicles.	
	Second Session: 0950-1120	Staff
MAE 301	ENGINEERING THERMODYNAMICS I	3
	<i>Prerequisites: MA 202, PY 208 or PY 206</i>	
	An introduction to the concept of energy and the laws governing the transfers and transformations of energy. Emphasis is placed on thermodynamic properties and First and Second law analysis of systems. Some basic statistical thermodynamic concepts are introduced and applied to the calculation of properties.	
	First Session: 0730-0900, 0800-0930, 0950 1120	Staff
MAE 302	ENGINEERING THERMODYNAMICS II	3
	<i>Prerequisite: MAE 301</i>	
	A continuation of Engineering Thermodynamics I with emphasis on the application of basic principles to engineering problems with systems involving mixtures of ideal gases, psychrometrics, nonideal gases, chemical reactions, combustion, chemical equilibrium, cycle analysis, and one-dimensional compressible flow.	
	Second Session: 0800-0930	Staff
MAE 303	ENGINEERING THERMODYNAMICS III	3
	<i>Prerequisite: MAE 301</i>	
	A continuation of Engineering Thermodynamics I for nonmechanical engineering juniors. Thermodynamics of mixtures; thermodynamics of fluid flow, heat transfer, vapor, and gas cycles, and applications.	
	Second Session: 1140-1310	Staff
MAE 305	MECHANICAL ENGINEERING LABORATORY I	1
	<i>Corequisite: MAE 301</i>	
	An introduction to the theory and practice of measurement and experimental data collection. The components of the generalized measurement systems are studied and their effects on the final result evaluated. Basic methods of data analysis as well as basic instrumentation for sensing, conditioning, and displaying experimental quantities are covered.	
	First Session: 1340-1750 TT	Staff
MAE 306	MECHANICAL ENGINEERING LABORATORY II	1
	<i>Prerequisites: MAE 305, EE 331</i>	
	A continuation of MAE 305 into specific types of measurements. Students will evaluate and compare different types of instrumentation for measuring the same physical quantity on the basis of cost, time required, accuracy, etc.	
	Second Session: 1340-1750 TT	Staff

MAE 307	ENERGY AND ENERGY TRANSFORMATIONS	3
	<i>Prerequisites: MA 201, PY 212</i>	
	Energy transformation as permitted by the First Law and limited by the Second Law. Properties of ideal gases and actual gases; properties of vapors. Vapor power cycles; vapor refrigerating cycles, gas cycles for internal combustion engines and gas turbines. Elements of heat transfer.	
	First Session: 0800-0930	Staff
MAE 315	DYNAMICS OF MACHINES	3
	<i>Prerequisites: MAE 216, EM 305</i>	
	A rational application of dynamics to the analysis of machines and mechanical devices to determine the motions resulting from applied loads and the forces and inputs required to produce specified motions.	
	First Session: 0950-1120	Staff
MAE 352	AERODYNAMICS	3
	<i>Prerequisites: EM 200, MA 301</i>	
	Fundamental concepts underlying experimental aerodynamics, the aerodynamicist's data, elementary flow theory, Reynolds number and the effect of viscosity, Mach number and compressibility, finite wing theory.	
	First Session: 0800-0930	Staff
MAE 353	INTRODUCTION TO AEROTHERMODYNAMICS	3
	<i>Prerequisites: MAE 301, C or better in MAE 352</i>	
	A specialization of thermodynamics to the study of inviscid, compressible flows of perfect gases. The theory is applied to channel flows, shock waves, expansions and two-dimensional airfoil theory.	
	Second Session: 0800-0930	Staff
MAE 402	HEAT AND MASS TRANSFER	3
	<i>Prerequisites: MAE 302, MA 301</i>	
	A study of the fundamental relationships of steady and transient heat transfer by conduction, convection, radiation and during changes of phase: mass transfer by diffusion and convection, simultaneous mass and heat transfer.	
	First Session: 0950-1120	Staff
MAE 416	MECHANICAL ENGINEERING DESIGN	4
	<i>Prerequisite: MAE 411 or MAE 415</i>	
	Application of the engineering and materials sciences to the total design of mechanical engineering components and systems. Consideration and utilization of the design process including problem definition, solution synthesis, design analysis, optimization and prototype evaluation through design project activity.	
	First Session: 0800-0930	Staff

MAE 521	AEROTHERMODYNAMICS	3
	<i>Prerequisites: MAE 301 and MAE 352 or EM 303</i>	
	Review of basic thermodynamics pertinent to gasdynamics. Detailed development of the general equations governing gas motion in both differential and integral form. Simplification of the equations to those for specialized flow regimes. Similarity parameters. Applications to simpler problems in various flow regimes.	
	First Session: 0950-1120	Staff
MAE 545	PROJECT WORK IN MECHANICAL ENGINEERING I	2
	Individual or small-group investigation of a problem stemming from a mutual student faculty interest. Emphasis is placed on providing a situation for exploiting student curiosity.	
	First Session: Hours Arranged	Staff
MAE 546	PROJECT WORK IN MECHANICAL ENGINEERING II	2
	Individual or small-group investigation of a problem stemming from a mutual student-faculty interest. Emphasis is placed on providing a situation for exploiting student curiosity.	
	Second Session: Hours Arranged	Staff
MAE 555	ADVANCED FLIGHT VEHICLE STABILITY AND CONTROL	3
	<i>Prerequisite: MAE 462</i>	
	Analysis and design of flight control systems to included autopilots and stability argumentation systems. Study of effects of inertial cross-coupling and nonrigid bodies on vehicle dynamics.	
	First Session: Hours Arranged	Mr. Hale
MAE 593	SPECIAL TOPICS IN MECHANICAL ENGINEERING	3
	<i>Prerequisite: Advanced undergraduate or graduate standing</i>	
	Faculty and student discussions of special topics in mechanical engineering.	
	Both Sessions: Hours Arranged	Staff
MAE 651	PRINCIPLES OF FLUID MOTION	3
	<i>Prerequisite: MAE 554</i>	
	<i>Corequisite: MA 511</i>	
	Second Session: Hours Arranged	Staff
MAE 699	MECHANICAL ENGINEERING RESEARCH	Credits Arranged
	<i>Prerequisites: Graduate standing in mechanical engineering, consent of adviser</i>	
	Both Sessions: Hours Arranged	Staff

## Meteorology

MY 441	METEOROLOGICAL ANALYSIS I	3
	<i>Prerequisites: MY 421, MY 422, MY 435</i>	
	Theory and analysis of atmospheric distributions, processes and developments in the three-space dimensions and time.	
	First Session: 0800-0930	Staff

MY 443	METEOROLOGICAL LABORATORY I	4
	<i>Prerequisite: MY 435</i>	
	<i>Corequisite: MY 441</i>	
	Lab course in analysis of atmospheric distributions, processes and developments, employing regularly available meteorological data and the principles presented in prerequisite and corequisite courses.	
	Second Session: 0910-1010 or Hours Arranged	Staff
MY 521	THE UPPER ATMOSPHERE	3
	<i>Prerequisite: MY 411 or consent of instructor</i>	
	First Session: 0950-1120	Staff
MY 593	ADVANCED TOPICS	2
	<i>Prerequisite: Consent of staff</i>	
	Second Session: 1020-1120 or Hours Arranged	Staff

## Microbiology

MB 301	MICROBIAL LIFE	3
	Introduction to the basic concepts of microbiology and how they affect our daily lives. Primarily for nonbiologists.	
	Second Session: 0950-1120	Mr. Hayes
MB 302	CLINICAL MICROBIOLOGY LAB	1
	<i>Corequisite: MB 301</i>	
	Techniques of isolating and characterizing microorganisms of medical significance. For student nurses and other paramedical students.	
	Second Session: 1340-1650 MWF	Mr. Hayes
MB 692	SPECIAL PROBLEMS IN MICROBIOLOGY	Credits Arranged
	Both Sessions: Hours Arranged	Staff
MB 699	MICROBIOLOGY RESEARCH	Credits Arranged
	Both Sessions: Hours Arranged	Staff

## Modern Languages

### FRENCH

MLF 101	ELEMENTARY FRENCH I	3
	Structure, diction, pronunciation and other matters of technique of the language, supplemented by readings and translations. No previous training in the language necessary.	
	First Session: 0800-0930, 0950-1120	Staff

- MLF 102 ELEMENTARY FRENCH II 3  
*Prerequisite: MLF 101 or equivalent*  
 A survey of the basic elements of grammar accompanied and illustrated by intermediate readings progressing to the reading of standard texts.  
 Both Sessions: 0800 0930 Staff
- MLF 200 REVIEW GRAMMAR AND COMPOSITION 3  
*Prerequisite: MLF 102 or equivalent*  
 This course will bridge the gap between basic grammar courses and the more advanced literary courses preparing the student for the type of composition and conversation expected of him in the latter. It will also offer an opportunity for students with previous knowledge of a language from secondary schools to review grammar and obtain experience in an area not normally covered in their high school work.  
 First Session: 0950 1120 Staff
- MLF 202 FRENCH PROSE: SELECTIONS FROM MODERN FRENCH LITERATURE 3  
*Prerequisite: MLF 102 or equivalent*  
 Selected readings from literary French. Attention given to the attainment of skill in reading and comprehension.  
 Second Session: 0950-1120 Staff
- MLF 401 FRENCH GRAMMAR FOR GRADUATE STUDENTS 3  
 This course is designed to present the grammar of scientific French as rapidly as possible in preparation for the reading course which follows.  
 First Session: 0800-0930 Staff
- MLF 402 SCIENTIFIC FRENCH 3  
*Prerequisite: MLF 401 or equivalent*  
 Reading and translation of technical French, supplemented by discussions of terminology, word order, vocabulary analysis and other linguistic techniques. Subject material adjusted to individual needs; conferences.  
 Both Sessions: Hours Arranged Staff

## GERMAN

- MLG 101 ELEMENTARY GERMAN I 3  
 Study of the structure and technique of the language supplemented by easy reading and translation. No previous training in the language necessary.  
 First Session: 0800 0930 Staff

MLG 102	ELEMENTARY GERMAN II	3
	<i>Prerequisite: MLG 101 or equivalent</i>	
	A course designed primarily for students who wish to attain proficiency in reading German. Attention given to basic grammar and vocabulary with practice in the translation and interpretation of German prose.	
	Second Session: 0800-0930	Staff
MLG 201	GERMAN PROSE: SELECTIONS FROM MODERN GERMAN LITERATURE	3
	<i>Prerequisite: MLG 102 or equivalent</i>	
	First Session: 0800-0930	
MLG 401	GERMAN GRAMMAR FOR GRADUATE STUDENTS	3
	This course is open to graduate students and senior honor students and is designed to present the grammar of scientific German as rapidly as possible in preparation for the reading course which follows.	
	First Session: 0950-1120	Staff
MLG 402	SCIENTIFIC GERMAN	3
	<i>Prerequisite: MLG 401 or equivalent</i>	
	Reading and translation of technical German, supplemented by discussions on terminology, word order, vocabulary analysis and other linguistic techniques. Subject material adjusted to individual needs; conferences.	
	Both Sessions: Hours Arranged	Staff

## SPANISH

MLS 101	ELEMENTARY SPANISH I	3
	Structure, diction, pronunciation and other matters of technique of the language, supplemented by easy readings. No previous training in the language necessary.	
	First Session: 0800-0930, 0950-1120	
MLS 102	ELEMENTARY SPANISH II	3
	<i>Prerequisite: MLS 101 or equivalent</i>	
	A survey of the basic elements of grammar accompanied and illustrated by intermediate progressing to the reading of standard texts.	
	First Session: 0950-1120	
	Second Session: 0800-0930	Staff
MLS 200	REVIEW GRAMMAR AND COMPOSITION	3
	<i>Prerequisite: MLS 102 or equivalent</i>	
	This course will bridge the gap between basic grammar courses and the more advanced literary courses preparing the student for the type of composition and conversation expected of him in the latter. It will also offer an opportunity for students with previous knowledge of a language from secondary schools to review grammar and obtain experience in an area not normally covered in their high school work.	
	First Session: 0800-0930	Staff



MLS 201	SPANISH CIVILIZATION	3
	<i>Prerequisite: MLS 102 or equivalent</i>	
	Emphasis is placed upon translating Spanish prose and developing vocabulary. The readings give the student a comprehensive picture of the culture, geography, history and economy of Spain.	
	First Session: 0950-1120	Staff
MLS 202	HISPANO-AMERICAN CIVILIZATION	3
	<i>Prerequisite: MLS 102 or equivalent</i>	
	Comprehensive picture of the culture, geography, history and economy of the Spanish-American countries.	
	Second Session: 0950 1120	Staff
MLS 401	SPANISH GRAMMAR FOR GRADUATE STUDENTS	3
	The course is designed to present the grammar of scientific Spanish as rapidly as possible in preparation for the reading course which follows.	
	First Session: 0800-0930	Staff
MLS 402	SCIENTIFIC SPANISH	3
	<i>Prerequisite: MLS 401 or equivalent</i>	
	Reading and translation of technical Spanish, supplemented by discussion and terminology, word order, vocabulary analysis and other linguistic techniques. Subject material adjusted to individual needs; conferences.	
	Second Session: Hours Arranged	Staff

## Music

MUS 200	MUSIC IN CONTEMPORARY LIFE	3
	A course especially designed to assist students in developing their understanding of music as a vital part in today's life. Special emphasis on evaluating musical form and content, style periods, design and interpreting music as it relates to various aspects of today's society.	
	First Session: 0800 0930, 0950-1120	Messrs. Bliss, Ostergren
	Second Session: 0800-0930	Mr. Adcock
MUS 210	A SURVEY OF MUSIC IN AMERICA	3
	A survey of the music in the United States from colonial times to the present, with particular emphasis on the major influences which have shaped the musical literature and culture of America.	
	First Session: 0800-0930	Mr. Ostergren
	Second Session: 0950-1120	Mr. Adcock
MUS 220	MUSIC OF THE ROMANTIC PERIOD	3
	A course designed to provide an insight into the significant musical trends of the Romantic Period (1800 1900). Subject matter will include an analysis of the prevailing musical forms, the styles of the composers, and the relation of music to other art forms.	
	First Session: 0950-1120	Mr. Bliss

MUS 320	MUSIC OF THE 20TH CENTURY	3
	A study of representative music from 1900 to the present. Emphasis is upon musical ideas and materials. The traditions and innovations, as exemplified in the music of this century are examined.	
	Both Sessions: 0950-1120	Messrs. Adcock, Bliss

## Nuclear Engineering

NE 491, 492	NUCLEAR ENGINEERING TOPICS I, II	3
	<i>Prerequisite: NE 402</i>	
	This course is intended to provide more detailed coverage of important nuclear engineering topics such as radiation applications, nuclear fuel cycles and isotope production, reactor systems, and radiological and reactor safety. This course provides a nucleus of special emphasis courses that may be elected by nuclear engineering seniors and professional degree students.	
	Both Sessions: Hours Arranged	Staff
NE 591, 592	SPECIAL TOPICS IN NUCLEAR ENGINEERING I, II	3
	<i>Prerequisite: Consent of instructor</i>	
	This course will be used to explore unusual and/or specialized areas of nuclear engineering.	
	Both Sessions: Hours Arranged	Staff
NE 691	ADVANCED TOPICS IN NUCLEAR ENGINEERING I	3
	<i>Prerequisite: Consent of instructor</i>	
	A study of recent developments in nuclear engineering theory and practice.	
	First Session: Hours Arranged	Staff
NE 699	RESEARCH IN NUCLEAR ENGINEERING	Credits Arranged
	<i>Prerequisite: Graduate standing</i>	
	Individual research in the field of nuclear engineering.	
	Both Sessions: Hours Arranged	Staff

## Operations Research

OR 501	INTRODUCTION TO OPERATIONS RESEARCH	3
	<i>Prerequisites: MA 405, MA 421</i>	
	An introduction to the literature and methodology of operations research and its application in the areas of production and logistics control, queues, replacement, allocation and competitive systems.	
	Special eight-week session (June 10-July 31): 1300-1500 MWF	
OR 505 (IE 505, MA 505)	MATHEMATICAL PROGRAMMING I	3
	<i>Prerequisite: MA 405</i>	
	A rigorous and complete development of the theoretical and computational aspects of linear programming as well as discussion of applications.	
	Second Session: 0800-0930	Staff

*Prerequisites: MA 405, ST 421*

An introduction to the theory and computational aspects of dynamic programming and its application to sequential decision problems.

Second Session: 0950-1120

Mr. Nuttle

## Philosophy

(Also see religion, page 89.)

- PHI 201 LOGIC 3  
This is a basic course covering the nature and evaluation of logical discourse, both deductive and inductive. Deductive topics include aspects of traditional term logic as well as an elementary introduction to contemporary symbolic logic. Inductive topics include probability, generalization, analogy and hypothesis.  
First Session: 0800-0930, 0950 1120 Mr. O'Neil  
Second Session: 0800-0930, 0950-1120 Mr. Metzger
- PHI 205 PROBLEMS AND TYPES OF PHILOSOPHY 3  
This is an introductory course, and the matters discussed will always be those with a history of importance in philosophy, such as problems concerning God, freedom, justice, and the nature and objects of human knowledge.  
First Session: 0800 0930, 0950 1120, 1140 1310  
Messrs. Bredenberg, VanDeVeer  
Second Session: 0800-0930, 0950-1120 Mr. Regan
- PHI 304 (ED 304) PHILOSOPHY OF EDUCATION 3  
The function of this course is to examine certain so called theories of education, to evaluate their assumptions and conclusions, and to attempt to understand their crucial terms. The course also seeks to explore philosophically the ends, goals, and norms of education.  
First Session: 0950 1120, 1140 1310 Mr. Bryan  
Second Session: 0950-1120, 1140 1310 Mr. Middleton
- PHI 306 PHILOSOPHY OF ART 3  
The general course objective is to analyze concepts and theories encountered in discussions of art in such a way as to illuminate the nature of works of art, esthetic experiences and art criticism. Special attention is given to such concepts as creation, expression, intention, interpretation, communication, and evaluation and to the problems and fallacies which seem to be involved in the use of these concepts.  
First Session: 0950-1120 Mr. Bredenberg
- PHI 405 PHILOSOPHY OF SCIENCE 3  
This course is concerned with the character and function of "explanation" in scientific activity. It examines the concepts of "law" and "theory" and seeks to establish the kind of claims to knowledge

that scientific activity is entitled to advance. The role of inductive confirmation is examined, and the relationship between natural and social science explored.

First Session: 1140-1310  
Second Session: 1140-1310

Mr. O'Neil  
Mr. Metzger

## Physical Education

- PE 112 BEGINNING SWIMMING I 1  
A course for nonswimmers which is designed for meeting the departmental swimming requirements and for preparing the student to take Intermediate Swimming.  
First Session: 1300-1400 Mr. Keating
- PE 221 INTERMEDIATE SWIMMING 1  
A course designed to give the student competence in four basic strokes and two dives.  
Both Sessions: 1200-1300, 1300-1400 Mrs. Smaltz, Mr. Daniels
- PE 241 ANGLING 1  
A course designed to teach the fundamental skills of spin, fly and bait casting and an understanding of game fishing.  
First Session: 1200-1300 Mr. Keating
- PE 242 BADMINTON 1  
A course designed to give the beginning skills in the basic strokes and a general knowledge of the history, rules and strategy of the game.  
First Session: 1300-1400 Mr. Drews  
Second Session: 1020-1120, 1300-1400, 1420-1520 Messrs. Daniels, Farris
- PE 245 GOLF 1  
A course designed for teaching beginners the grip, stance, swing and use of the various clubs, along with the history and etiquette of play.  
First Session: 0800-0900, 1020-1120, 1200-1300, 1300-1400  
1400-1500, 1500-1600 Mrs. Smaltz, Mr. Gwyn  
Second Session: 1200-1300, 1300-1400, 1500-1600 Mr. Edwards
- PE 249 TENNIS I 1  
A course designed to give beginners a thorough knowledge of the history, rules and strategy, as well as the fundamental skills of tennis.  
First Session: 0910-1010, 1020-1120, 1420-1520, 1520-1620 Messrs. Drews, Keating  
Second Session: 1200-1300, 1420-1520, 1520-1620 Mr. Farris

PE 251	TARGET ARCHERY	1
	A course designed to teach the fundamental skills of target archery and the selection and care of archery equipment.	
	First Session: 1020-1120, 1320 1420	Mr. Barker
	Second Session: 1020-1120, 1420-1520	Mr. Weaver
PE 265	SOFTBALL	1
	A course designed to include the fundamental skills, history and rules of the game.	
	Both Sessions: 1520 1620	Messrs. Barker, Weaver
PE 269	VOLLEYBALL	1
	A course designed to include the fundamental skills, history, rules and strategy of the game.	
	Both Sessions: 1200-1300	Messrs. Barker, Weaver

## Physics

PY 205	GENERAL PHYSICS	4
	<i>Corequisite: MA 201</i>	
	Mechanics, heat and sound.	
	First Session: LR 0800-0930; LB 1250-1500, 1510-1720 TT	
	Second Session: LR 0800 0930, 0950-1120; LB 1250-1500, 1510-1720 MW or TT	Staff
PY 206	GENERAL PHYSICS	4
	<i>Prerequisite: PY 205</i>	
	Electricity and magnetism.	
	First Session: LR 0950-1120; LB 1250 1500 MW	Staff
PY 207	GENERAL PHYSICS	4
	<i>Prerequisite: PY 206</i>	
	Light and modern physics.	
	Second Session: LR 0950-1120; LB 1250-1500 TT	
PY 208	GENERAL PHYSICS	4
	<i>Prerequisite: PY 205</i>	
	Electricity, light and modern physics.	
	Both Sessions: LR 0950-1120; LB 1250-1500, 1510-1720 MW	Staff
PY 211	GENERAL PHYSICS	4
	<i>Prerequisite: MA 111 or MA 116</i>	
	Mechanics, heat and sound	
	Both Sessions: LR 0950 1120; LB 1250-1500, 1510-1720 MW	Staff

PY 212	GENERAL PHYSICS <i>Prerequisite: PY 211</i> Light and electricity. Both Sessions: LR 0800-0930; LB 1250-1500, 1510-1720 MW	4   Staff
PY 221	COLLEGE PHYSICS <i>Prerequisite: MA 111</i> An introduction to the origins of physical science, the fundamental principles of physics and the many applications to modern technology. Lectures and demonstrations with class participation. Both Sessions: 0730-1010	5   Staff
PY 231	FOUNDATIONS OF PHYSICS <i>Prerequisite: MA 111 or MA 115</i> A survey course concerned with the philosophy, the methods and the fundamental concepts of physics. First Session: 1020-1300	5   Staff
PY 401	MODERN AND QUANTUM PHYSICS I <i>Prerequisite: PY 411 or equivalent</i> Special relativity, the origin of quantum theory, atomic structure and optical spectra. First Session: 0800-0930	3   Staff
PY 402	MODERN AND QUANTUM PHYSICS II <i>Prerequisite: PY 401</i> Introductory quantum mechanics, x-rays, introductory nuclear physics and fundamental particles. Second Session: 0800-0930	3   Staff
PY 407	INTRODUCTION TO MODERN PHYSICS <i>Prerequisites: PY 208, MA 202</i> A survey of the important developments in atomic and nuclear physics of this century. Both Sessions: 0800-0930	3   Staff
PY 410	NUCLEAR PHYSICS I <i>Prerequisite: PY 207 or PY 407</i> An introduction to the properties of the nucleus and the interaction of radiation with matter. First Session: LR 0950-1120; LB 1340-1550 TT	4   Staff
PY 499	SPECIAL PROBLEMS IN PHYSICS <i>Prerequisite: Consent of department</i> Study and research in special topics of classical and modern physics. Both Sessions: Hours Arranged	1-3   Staff

PY 510	NUCLEAR PHYSICS II	4
	<i>Prerequisite: PY 410</i>	
	The description and analysis of nuclear energy levels, meson theory, nuclear resonance, atomic and molecular magnetism, and cosmic radiation. Principles and experiments in neutron physics are covered.	
	First Session: LR 0730 0900; LB Hours Arranged	Staff
PY 599	SENIOR RESEARCH	3
	<i>Prerequisite: Senior honors program standing, except with special permission</i>	
	Investigations in physics which may consist of literature surveys, experimental measurements or theoretical studies.	
	Both Sessions: Hours Arranged	Staff
PY 695	SEMINAR	1
	Both Sessions: 1300-1430 MW	Staff
PY 699	RESEARCH	Credits Arranged
	Both Sessions: Hours Arranged	Staff

## Plant Pathology

PP 595	SPECIAL PROBLEMS IN PLANT PATHOLOGY	Credits Arranged Maximum 6
	<i>Prerequisite: Consent of instructor</i>	
	Investigation of special problems in plant pathology not related to a thesis problem. The investigation may consist of original research and or literature survey.	
	Both Sessions: Hours Arranged	Staff
PP 699	RESEARCH IN PLANT PATHOLOGY	Credits Arranged
	<i>Prerequisites: Graduate standing, consent of instructor</i>	
	Original research in plant pathology.	
	Both Sessions: Hours Arranged	Staff

## Politics

PS 201	THE AMERICAN GOVERNMENTAL SYSTEM	3
	A study of the American federal system, integrating national and state government, with emphasis on constitutional principles, major governmental organs, governmental functions, and the politics and machinery of elections. Some attention is given to other types of political systems, and comparisons are made where relevant throughout the course.	
	First Session: 0800-0930, 0950-1120	Messrs. Gilbert, Mastro
	Second Session: 0800-0930	Mr. Maafu

- PS 206 LOCAL GOVERNMENTAL SYSTEMS 3  
 An introductory study of governmental systems in the U.S. which have a primarily local focus. In addition to the examination of traditional local forms — city, county, township and district — attention will be given to the national, state and regional contexts for local government. Topics will include federalism and intergovernmental relations, governmental structures, political processes and political power, urbanization and problems of social and technological change, and approaches to reform.  
 First Session: 0950-1120 Mr. McClain
- PS 222 INTRODUCTION TO GLOBAL POLITICS 3  
 This introduction to politics in the global arena examines roles and behaviors of nation-states and of nonstate actors such as individual decision-makers, interest groups, national minorities, revolutionary groups, international organizations, alliances and multinational businesses. Major concerns include causes of international conflict, ways of resolving them, and evaluation of theories of peace and international cooperation. Some current problem areas will be analyzed, and consideration given to some alternative futures of our global system.  
 First Session: 1140-1310 Mr. Soroso
- PS 401 AMERICAN PARTIES AND PRESSURE GROUPS 3  
 An analysis of political parties and interest groups as instruments for shaping public policy and implementing democratic values. Political parties and interest groups are considered as variables in the larger American system within which they exist. Attention focuses on the nature of their organization, their membership and leadership recruitment process, and their problems in aggregating votes. Attention will also be given to such topics as political style — the relationship between major and minor parties and the differences between the major parties.  
 First Session: 0800-0930 Mr. Holtzman
- PS 404 BLACK POLITICAL IDEOLOGY 3  
*Prerequisite: Six hours of social science*  
 The study of the political thought of Black and non-Black political thinkers on the problems, struggle and movement of the Afro-Americans. Black political ideology will be related to the Afro-American movement for social change and it will be placed into the mainstream of traditional and modern political philosophy.  
 Second Session: 1140-1310 Mr. Maafo
- PS 405 NATIONAL SECURITY POLICY 3  
*Prerequisite: PS 321*  
 An investigation into 1) the making of security policy including the role of the Executive, Congress and nongovernmental actors; 2) the evolution of changing assumptions, strategies, and goals; and 3) the nature of U. S. security requirements, U. S. military commitments abroad, and the "costs" of strategies based on arms superiority, arms control and disarmament.  
 First Session: 0950-1120 Mr. Gilbert



- PS 472      SOVIET POLITICS      3  
 This course focuses on the contemporary Soviet political system, its structure, functions and processes, with brief consideration of the historical and ideological base of Soviet politics. As a course in comparative politics, the analysis will proceed within a framework designed to elucidate the similarities and differences of the Soviet system with other political systems. In addition, the Soviet system will be tested against a theoretical model of totalitarian dictatorships.  
 First Session: 0730-0900      Mr. Mastro
- PS 498      SPECIAL TOPICS IN POLITICS      3-6  
*Prerequisite: Six hours of politics*  
 The student will make a detailed investigation of a special topic in politics. The topic and mode of study will be determined by the student and a member of the department's faculty.  
 First Session: 0800-0930      Mr. Soroos
- PS 506      PUBLIC PERSONNEL ADMINISTRATION      3  
*Prerequisite: PS 502 or consent of instructor*  
 A study in depth of the institutions and the sequence of processes in public personnel administration. It examines existing practices but is primarily concerned with emerging theories and trends.  
 Second Session: 0950-1120      Mr. Ellis
- PS 507      COLLECTIVE NEGOTIATIONS IN THE PUBLIC SERVICE      3  
*Prerequisite: PS 201 or consent of instructor*  
 This course includes intensive consideration of the background of the collective negotiations movement; analysis of key policy issues, such as bargaining rights and use of strike weapon; framework for collective negotiations; scope and conduct of negotiations; impasse resolution; grievance procedure.  
 Second Session: 0800-0930      Mr. Ellis
- PS 509      SCOPE AND METHOD OF POLITICS      3  
*Prerequisite: PS 200 or consent of instructor*  
 This course reviews contemporary theories, concepts and methods fundamental to the study of politics. It emphasizes current empirical research and the collateral involvement in research activities aimed at the development of basic skills in this area.  
 Second Session: 1200-1330      Mr. Williams
- PS 531      THE LEGISLATIVE PROCESS      3  
*Prerequisite: PS 200 or consent of instructor*  
 A study of the formulation of public policy from the institutional and behavioral viewpoints. Important current legislative problems at the congressional and state legislative levels will be selected and will serve as a basis for analyzing the legislative process.  
 First Session: 0950-1120      Mr. Holtzman

PS 542	GOVERNMENTAL PLANNING	3
	<i>Prerequisite: PS 502</i>	
	A study of the planning function at all levels of government in the United States, with particular attention to the problems posed for planning by the rapid growth of metropolitan areas.	
	First Session: 0730-0900	Mr. McClain

## Poultry Science

PO 201	POULTRY PRODUCTION	4
	<i>Prerequisite: BS 100</i>	
	A general introductory course in the principles and practices of broiler, market egg, hatching egg and turkey production.	
	First Session: LR 0950-1120; LB 1340-1620 TT	Mr. Parkhurst
PO 698	SPECIAL PROBLEMS IN POULTRY SCIENCE	Maximum 6
	<i>Prerequisite: Graduate standing</i>	
	Both Sessions: Hours Arranged	Mr. Hill
PO 699	POULTRY RESEARCH	Credits Arranged
	<i>Prerequisite: Graduate standing</i>	
	Both Sessions: Hours Arranged	Mr. Hill

## Psychology

PSY 200	INTRODUCTION TO PSYCHOLOGY	3
	A study of the general characteristics of human behavior, including motivation, learning, development, emotion, thinking, perception, sensation and measurement.	
	Both Sessions: 0800-0930, 0950-1120, 1140-1310, 1340-1510	Staff
PSY 210	PSYCHOLOGICAL ANALYSIS APPLIED TO CURRENT PROBLEMS	3
	<i>Prerequisite: PSY 200</i>	
	The development of skills in the analysis and understanding of selected current problems through the use of psychological knowledge and techniques.	
	First Session: 0950-1120	Mr. Cook
PSY 300	PERCEPTION	3
	<i>Prerequisites: PSY 200, sophomore standing, introductory physics or chemistry recommended</i>	
	An extensive survey of the determiners of perception. The roles of learning and motivation as determiners of perception are emphasized.	
	First Session: 0950-1120	Mr. Lubow

PSY 302	PSYCHOLOGY OF PERSONALITY AND ADJUSTMENT	3
	<i>Prerequisite: PSY 200</i>	
	A study of the factors involved in the development of the normal personality.	
	First Session: 0800-0930	Mr. Corter
PSY 304	EDUCATIONAL PSYCHOLOGY	3
	<i>Prerequisite: PSY 200</i>	
	A study of learning and evaluation in the context of educational practice.	
	First Session: 0800-0930, 0950-1120	Messrs. Johnson, Miller
PSY 310	LEARNING AND MOTIVATION	3
	<i>Prerequisites: PSY 200 (PSY 300 recommended)</i>	
	Experimental study of learning and motivation with emphasis on theoretical structure of these topics.	
	First Session: 1140-1310	Mr. Cole
PSY 320	COGNITIVE PROCESSES	3
	<i>Prerequisites: PSY 200, PSY 310</i>	
	A course in complex cognitive processes such as thinking, reasoning, problem solving, creativity and originality, intelligence, social interaction, verbal behavior and decision processes.	
	First Session: 1340-1510	Mr. Cole
PSY 337	INDUSTRIAL PSYCHOLOGY I	3
	<i>Prerequisite: PSY 200</i>	
	The application of psychological principles to the problems of industry and business.	
	First Session: 1140-1310	Mr. Schlenger
PSY 411	SOCIAL PSYCHOLOGY	3
	<i>Prerequisite: PSY 200</i>	
	The individual in relation to social factors. Socialization, personality development, communication, social conflict and social change.	
	Second Session: 0950 1120	Staff
PSY 475	CHILD PSYCHOLOGY	3
	<i>Prerequisites: PSY 200 or PSY 304</i>	
	The development of the individual child of elementary school age will be the inclusive object of study in this course. Emphasis will be placed upon the intellectual, social, emotional and personality development of the child. Physical growth will be emphasized as necessary to an understanding of the psychological development of the pupil.	
	First Session: 0800 0930	Mr. Gardner
PSY 491, 492	SEMINARS IN PSYCHOLOGY	3
	<i>Prerequisites: Senior standing, consent of department</i>	
	The course was designed to provide the undergraduate psychology major with skill in designing and conducting independent research.	
	Both Sessions: 1340 1510	Mr. Newman

PSY 504	ADVANCED EDUCATIONAL PSYCHOLOGY	3
	<i>Prerequisites: Six hours in psychology</i>	
	A critical appraisal of current psychological findings that are relevant to educational practice and theory.	
	First Session: 0800-0930, 0950-1120	Messrs. Johnson, Miller
PSY 535	TESTS AND MEASUREMENTS	3
	<i>Prerequisites: Six hours in psychology</i>	
	An introduction to the theory of psychological measurement.	
	First Session: 0950-1120	Staff
PSY 576	DEVELOPMENTAL PSYCHOLOGY	3
	<i>Prerequisites: Nine hours psychology including PSY 475 or PSY 476</i>	
	A survey of the role of growth and development in human behavior, particularly of the childhood and adolescent periods.	
	First Session: 0950-1120	Mr. Gardner
PSY 599	RESEARCH PROBLEMS IN PSYCHOLOGY	Credits Arranged
	<i>Prerequisites: Consent of instructor</i>	
	Research project for graduate students supervised by members of the graduate faculty. Research to be elected on basis of interest of student, and is not to be part of thesis or dissertation research.	
	Both Sessions: Hours Arranged	Graduate Staff
PSY 690	SEMINAR IN INDUSTRIAL PSYCHOLOGY	3
	Scientific articles, analysis of experimental designs in industrial psychology, and special problems of interest to graduate students in industrial psychology.	
	Both Sessions: Hours Arranged	Mr. Miller
PSY 693	PSYCHOLOGICAL CLINIC PRACTICUM	Maximum 12
	<i>Prerequisites: Nine hours in psychology</i>	
	Clinical participation in interviewing, counseling, psychotherapy and administration of psychological tests.	
	First Session: Hours Arranged	Mr. Corter
PSY 699	THESIS AND DISSERTATION RESEARCH	Credits Arranged
	<i>Prerequisites: Graduate standing, consent of instructor</i>	
	Both Sessions: Hours Arranged	Staff

## Recreation Resources Administration

RRA 152	INTRODUCTION TO RECREATION	3
	This course is designed to provide instruction in the areas of history and foundations of recreation including objectives, economic and social aspects, definition and importance; status of organized recreation in our modern society; certain applied principles of recreation, recre-	

ational leadership; activities and program planning. This course is of lecture-laboratory technique.

First Session: 0950-1120

Mr. Warren

Second Session: 0800-0930, 0950-1120

Mr. Sternloff

RRA 215 MAINTENANCE AND OPERATION I 3

*Prerequisite:* RRA 152

This course deals with methods of operation of various park and recreation facilities for public use; protection and law enforcement; job planning and scheduling; preventive maintenance; and modern maintenance techniques and maintenance materials.

First Session: 0800-0930

Mr. Warren

RRA 354 PERSONAL AND COMMUNITY HEALTH 3

*Prerequisite:* Junior standing

This course presents the essential present-day knowledge of personal and community health. Emphasis is placed upon health problems, disease prevention, communicable diseases and their control, public health administration, school and industrial hygiene, and various other health problems confronting the individual and community. The course presents valuable and interesting health information to college men and women in order that they might live more intelligently in terms of newer health concepts and also be better prepared to assume their responsibilities as citizens of their respective communities.

Second Session: 0950-1120

Mr. Sternloff

RRA 475 RECREATION AND PARK INTERNSHIP 9

*Prerequisites:* Senior standing, RRA 359

Special nine-week session: Hours Arranged

Messrs. Miller, Smith

## Religion

(Also see Philosophy, page 79.)

REL 300 INTRODUCTION TO RELIGION 3

Man's religiousness, a universal and intensely personal phenomenon, appearing in many rich traditions, archaic and Asian as well as Western, is the subject matter of this course. Various aspects of religion are analyzed, including the development of the great traditions, myth and ritual, religious language and aesthetic form, general world view and salvational motif, and the relation of religion to personal maturity, cultural change and the social good.

First Session: 0800-0930

Mr. Highfill

Second Session: 0800-0930

Mr. Fitzgerald

REL 327 CONTEMPORARY RELIGIOUS THOUGHT 3

This course investigates the several lines of development of religious thought which have resulted from attempts to reconcile traditional religious concepts with the rapidly changing intellectual and social scene. Among the topics considered are the nature of religion in a secular age, ideas of God, the functions of religious institutions and interfaith relations.

Second Session: 0950-1120

Mr. Fitzgerald



SOC 301	HUMAN BEHAVIOR	3
	A study of the effects of social interaction upon individual behavior and personality; collective attitudes and behavior as products of group experience; analysis of fashions and fads, crowds, mobs, publics, social movements.	
	First Session: 0950-1120, 1140-1310	Staff
	Second Session: 0800-0930, 0950-1120	Staff
SOC 303	CURRENT SOCIAL PROBLEMS	3
	Study of the social and cultural aspects of specific problems such as crime, divorce, race conflict, illness, poverty, housing, recreation and personality adjustment to demonstrate the basic integration of society and community life.	
	First Session: 0950-1120	Staff
	Second Session: 1140-1310	Staff
SOC 304	CONTEMPORARY FAMILY LIFE	3
	The social organization of the family with special attention to socialization, marital choice, kinship relations and the social changes affecting family structure and functions.	
	Both Sessions: 0800-0930	Staff
SOC 305	RACE RELATIONS	3
	Analysis of race relationships both in the United States and throughout the world with particular emphasis on factors producing the changes taking place at the present time.	
	Second Session: 1140-1310	Staff
SOC 306	CRIMINOLOGY	3
	The study of causation, treatment, prevention and control of criminality and juvenile delinquency. Special emphasis is placed on socio-cultural theories of causation and on the examination of court and correctional systems for adults and juveniles. Arranged field trips.	
	Both Sessions: 0800-0930	Staff
SOC 401	HUMAN RELATIONS IN INDUSTRIAL SOCIETY	3
	<i>Prerequisites: Senior standing, consent of instructor</i>	
	Studies in the sociology of occupations, professions and work, with special attention to human relations in industrial plants and other work situations.	
	First Session: 0800-0930	Staff
SOC 402	URBAN SOCIOLOGY	3
	<i>Prerequisite: SOC 202 or consent of instructor</i>	
	A study of the factors in the growth of cities; the relationship between the design of cities and their social organization; detailed analysis of new developments in the serving of human needs. City and regional planning.	
	Second Session: 1340-1510	Staff

- SOC 501 (ED 501) LEADERSHIP 3  
*Prerequisite: SOC 202 or equivalent*  
 A study of leadership in various fields of American life; analysis of the various factors associated with leadership; techniques of leadership. Particular attention is given to recreational, scientific and executive leadership procedures.  
*Students desiring to take a special three-week course must register through the Department of Adult and Community College Education. Special applications may be obtained from Dr. Robert J. Dolan, Professor of Adult and Community College Education, 310 Poe Hall. Students must use this special application rather than register through regular procedures. Applications must be submitted by Friday, June 4.*  
 First Session: 0950-1120 Staff  
 Special three-week session (June 21-July 9): 1340-1650 Mr. Young
- SOC 502 SOCIETY, CULTURE AND PERSONALITY 3  
*Prerequisite: SOC 202 or equivalent*  
 Human personality is studied from its origins in primary groups through its development in secondary contacts and its ultimate integration with social norms. While comparative anthropological materials will be drawn upon, emphasis is placed upon the normal personality and the adjustment of the individual to our society and to our culture. The dynamics of personality and character structure are analyzed in terms of the general culture patterns and social institutions of society.  
 First Session: 1340-1510 Staff
- SOC 503 CONTEMPORARY SOCIOLOGY 3  
*Prerequisite: Graduate standing*  
 The basic purpose of this course is to provide the student with an overview of the current status of sociological theory and research. It will introduce the student to contemporary sociological thinking and research and provide a base for further graduate training in the discipline.  
 Second Session: 1340-1510 Staff
- SOC 504 EDUCATION IN MODERN SOCIETY 3  
*Prerequisite: SOC 202, SOC 301 or equivalent*  
 An analysis of education using basic sociological concepts. Varying emphasis will be placed upon the historical development of education in the United States, cross-cultural comparisons of educational structure and function, professionalization of educators, investigation of the ecological factors affecting education, effects of group processes upon learning, and the effects of social processes and changes upon the educational institution.  
 First Session: 1140-1310 Staff
- SOC 512 FAMILY ANALYSIS 3  
*Prerequisite: SOC 202 or equivalent*  
 This course examines the basic theoretical and methodological framework in sociology within which contemporary family research is conducted.  
 First Session: 1340-1510 Staff



SOC 513 (ED 513) COMMUNITY ORGANIZATION 3  
*Prerequisite: SOC 202 or equivalent*  
 Community organization is viewed as a process of bringing about desirable changes in community life. Community needs and resources available to meet these needs are studied. Democratic processes in community action and principles of community organization are stressed, along with techniques and procedures. The roles of leaders, both lay and professional, in community development are analyzed.  
 Second Session: 0800-0930 Staff

SOC 541 SOCIAL SYSTEMS AND PLANNED CHANGE 3  
*Prerequisite: Three hours of sociology*  
 A study of social agencies and programs and their implementation through specific organizations in dynamic relation with the people whom they serve. Consideration is given to the relation of these agencies and programs to community structure and forces in society; coordination of the several types of agencies and programs, professional leadership and participation.  
 Second Session: 0800-0930 Staff

SOC 699 RESEARCH IN SOCIOLOGY Credits Arranged  
*Prerequisite: Consent of graduate study committee chairman*  
 Planning and execution of research, and preparation of manuscript under supervision of graduate committee.  
 Both Sessions: Hours Arranged Graduate Staff

## Soil Science

SSC 560 ADVANCED SOIL MANAGEMENT 3  
*Prerequisites: SSC 200, SSC 341*  
 Field studies of selected soil series in the Coastal Plain, Piedmont and Mountain areas of North Carolina. Discussion of management practices that should be associated with the various soils under different types of farming.  
 Special three-week session (June 4 June 25): Some all day field trips  
 Messrs. Cook, Kamprath, Phillips

SSC 590 SPECIAL PROBLEMS Credits Arranged  
*Prerequisite: SSC 200*  
 Special problems in various phases of soils. Problems may be selected or will be assigned. Emphasis will be placed on review of recent and current research.  
 Both Sessions: Hours Arranged Graduate Staff

SSC 699 RESEARCH Credits Arranged  
*Prerequisite: Graduate standing in soil science*  
 A maximum of six credits is allowed toward the master's degree, but any number toward the doctorate.  
 Both Sessions: Hours Arranged Graduate Staff

## Speech

- SP 210 VOICE AND ARTICULATION 3  
*Prerequisites: ENG 111, ENG 112 with a grade of C in at least one semester*  
A study of the basic processes of the production of speech. Attention given to student's voice quality, articulation, pronunciation and general vocal expression. Speech improvement; help in recognition and reduction of excessive regional substandard dialect.  
First Session: 0950-1120 Mr. Parker
- SP 231 EXPOSITORY SPEAKING 3  
*Prerequisites: ENG 111, ENG 112 with a grade of C in at least one semester*  
A study of the basic theories of informative report, and instructional speaking. Basic rhetorical, audience and idea analysis as well as the delivery of short expository speeches are stressed.  
First Session: 0800-0930, 0950-1120, 1140-1310 Staff  
Second Session: 0800-0930, 0950-1120 Staff

## Statistics

- ST 361 INTRODUCTION TO STATISTICS FOR ENGINEERS I 3  
*Prerequisite: College algebra*  
Survey of statistical techniques useful to engineers and physical scientists. Includes elementary probability, frequency distributions, sampling variation, estimation of means and standard deviations, confidence intervals, significance tests, control charts, elementary least squares, curve fitting.  
First Session: 0800-0930 Staff
- ST 511-S EXPERIMENTAL STATISTICS I 3  
*Prerequisite: ST 311 or graduate standing*  
Basic concepts of statistical models and use of samples; variation, statistical measures, distribution, tests of significance, analysis of variance and elementary experimental design, regression and correlation, chi-square.  
First Session: 0800-0930 Staff
- ST 512-S EXPERIMENTAL STATISTICS II 3  
*Prerequisite: ST 511 or equivalent*  
Covariance, multiple regression, factorial experiments, individual degrees of freedom, incomplete block designs, experiments repeated over space and time.  
Second Session: 0800-0930 Staff
- ST 541 (MA 541) THEORY OF PROBABILITY I 3  
(See mathematics, page 70.)

ST 591	SPECIAL PROBLEMS	1-3
	Development of techniques for specialized cases, particularly in connection with thesis and practical consulting problems.	
	Both Sessions: Hours Arranged	Staff
ST 619 (MA 619)	TOPICS IN ADVANCED PROBABILITY	3
	<i>Prerequisites: ST 617, 618 (MA 617, 618)</i>	
	Characteristic functions, infinitely divisible and stable laws, factorizations of probability distributions, laws of iterated logarithm, random walks, fluctuation theory, martingales, ergodic theory, Markov processes, the Poisson process, further topics in stochastic processes, applications.	
	Special eight-week session (June 4-July 30): 1015-1215 MWF	Staff
ST 691	ADVANCED SPECIAL PROBLEMS	1-3
	<i>Prerequisites: ST 502 or equivalent, ST 552</i>	
	Any new advance in the field of statistics which can be presented in lecture series as unique opportunities arise, including theory of sampling applied to survey design and analysis of linear models.	
	Both Sessions: Hours Arranged	Staff
ST 699	RESEARCH	Credits Arranged
	A maximum of nine credits is allowed toward the Master of Science degree; no limitation on credits toward the doctorate.	
	Both Sessions: Hours Arranged	Staff

## Textile Chemistry

TC 301	TECHNOLOGY OF DYEING AND FINISHING	5
	<i>Prerequisites: TC 203, TX 250</i>	
	A comprehensive course designed to familiarize the textile technology student with the basic principles involved and the procedures used for the preparation, dyeing, printing and finishing of natural and man-made fibers. Some emphasis is placed upon the chemical nature of dyes and fastness properties, and the chemical nature of finishes used to impart specific end use properties.	
	Second Session: LR 1020-1230; LB 1340-1620 TT	Mr. Hayes
TC 699	TEXTILE RESEARCH FOR TEXTILE CHEMISTRY	Credits Arranged
	Problems of specific interest to the textile industry will be assigned for study and investigation. The use of experimental methods will be emphasized. Attention will be given to the preparation of reports for publication. The master's thesis may be based upon the data obtained.	
	Both Sessions: Hours Arranged	Mr. Cates

## Textile Technology

- TX 211 FIBER SCIENCE II 3  
*Prerequisites: TC 203, MA 212 or MA 202*  
A presentation of the physical properties of textile raw materials as related to type of fibers and chemical structure. Typical areas of discussion are parameters used to describe textile fibers, classification in terms of quality factors, their reactions to moisture, stress-strain properties, methods of measuring physical properties covered in Fiber Science I, and relationship between polymer structure, fiber properties and their utilization as single fiber composites or blends of fibers.  
Second Session: LR 0800-0900; LB 1340-1620 MW Mr. Hutchison
- TX 220 YARN FORMING SYSTEMS 4  
*Prerequisites: T 101 or equivalent*  
A study of the principles of staple and filament yarn systems and structures. The influence of manufacturing system and the input materials on product characteristics is established.  
First Session: LR 0950-1120; LB 1340-1620 TT Mr. Smith
- TX 250 FABRIC FORMING SYSTEMS 4  
*Prerequisite: TX 220*  
A study of the basic fabric forming systems, including nonconventional, weaving and knitting. Emphasis is on fabric construction and geometry. Structures of fabric and resulting properties are related to raw materials and product performance.  
Second Session: LR 0950-1120; LB 1340-1620 TT Mr. Robinson
- TX 320 DESIGN AND CONTROL OF STAPLE YARN SYSTEMS 5  
*Prerequisite: TX 220*  
*Corequisite: TX 211*  
A discussion of the technological and economic aspects of staple yarn forming systems. Topics to be included are fiber-machine interactions, the use of automated systems and processes, the blending of similar and dissimilar textile fibers, and the control of the overall manufacturing operation to yield products with designed characteristics.  
Second Session: LR 1020-1230; LB 1340-1620 TT Messrs. Bradford, Pardue
- TX 330 TEXTILE MEASUREMENTS AND QUALITY CONTROL 4  
*Prerequisites: TX 250, ST 361*  
Principles of measuring basic physical properties of textile materials; techniques of in-process control and evaluation of finished product quality; application to the manufacturing sequence of statistical control charts and capability limits, aspects of sampling theory.  
First Session: LR 0950-1120; LB 1340-1620 TT Mr. Robinson
- TX 340 PRINCIPLES OF KNITTED FABRIC STRUCTURES 5  
*Prerequisites: TX 211, TX 250*  
Warp and weft knit fabrics, their properties, end uses and production as related to current trends and developments in fabrics and

machines. The principles of design and fabric geometry as a basis for performance, quality and costing. Finishing and its effect on fabric properties.

Second Session: LR 1020-1230; LB 1340-1620 TT Mr. Brown

- TX 350 WOVEN FABRIC STRUCTURES 5  
*Prerequisites: TX 211, TX 250*  
A study of performance characteristics of woven structures as related to properties of raw materials, fabric structure and methods of production. The utilization of modern control systems to optimize the systems involved in the production of woven fabrics.  
First Session: LR 1020-1230; LB 1340-1620 TT Mr. Moser
- TX 380 MANAGEMENT AND CONTROL OF TEXTILE SYSTEMS 3  
*Prerequisites: EC 206, TX 250*  
The principles and techniques of controlling the process of converting staple fibers of filament yarns into industrial and consumer products as viewed from the standpoint of the process decision maker.  
First Session: 0800-0930 Mr. Owens
- TX 426 LONG STAPLE AND TOW SYSTEMS 3  
*Prerequisites: TX 211, TX 220*  
Principles of long staple yarn forming systems, including the woolen, worsted, tow top, and compact carpet yarn systems. Emphasis is on the relationship of fiber structures and characteristics necessary to produce the desired properties and performance characteristics of such yarns as woolen and worsted blends with man made fibers, bulked yarns and carpet yarns.  
Second Session: LR 0910-1010; LB 1340 1620 MW Mr. Pardue
- TX 441 ADVANCED WEFT KNITTING 3  
*Prerequisite: TX 340*  
A study of advanced weft knit mechanisms and fabrics. The development of new fabrics for specific end uses.  
Second Session: LR 0800-0900; LB 1340-1620 MW Mr. Middleton
- TX 480 TEXTILE COST CONTROL 3  
*Prerequisites: EC 206, TX 320, TX 350*  
A study of cost methods applicable to textile costing with emphasis on decision-making. Interpretation of cost reports and their use in pricing and cost control.  
Second Session: 0730-0900 Mr. Powell
- TX 490 DEVELOPMENT PROJECT IN TEXTILE TECHNOLOGY 2-3  
*Prerequisites: Senior standing, consent of instructor*  
Introduction to research through experimental, theoretical and literature studies of textile and related problems.  
Both Sessions: Hours Arranged Mr. Porter

TX 590	SPECIAL PROJECTS IN TEXTILES	2-3
	<i>Prerequisites: Senior or graduate standing, consent of instructor</i>	
	Special studies in either the major or minor field of the advanced undergraduate or graduate student. These studies will include current problems of the industry, independent investigations, seminars and technical presentations, both oral and written.	
	Both Sessions: Hours Arranged	Mr. Porter
TX 602	STAPLE FIBER STRUCTURES II	3
	<i>Prerequisite: Graduate standing</i>	
	Problems dealing with advanced textile production and the technological implications of fiber processing will be assigned for study and investigation. Attention will be given to the preparation of reports for oral and written presentation.	
	Both Sessions: Hours Arranged	Mr. Porter
TX 631	SYNTHETIC FIBERS	2
	<i>Prerequisites: TX 425 or TX 426 or equivalent</i>	
	Lectures and projects on advanced problems relative to the properties and processing of man-made continuous-filament and staple-fiber yarns.	
	Both Sessions: Hours Arranged	Mr. Porter
TX 680	SPECIAL PROJECTS IN TEXTILE MANAGEMENT	3
	<i>Prerequisite: TX 585</i>	
	Both Sessions: Hours Arranged	Mr. Cooper
TX 699	TEXTILE RESEARCH	Credits Arranged
	Problems of specific interest to the textile industry will be assigned for study and investigation. The use of experimental methods will be emphasized. Attention will be given to the preparation of reports for publication. The master's thesis may be based upon the data obtained.	
	Both Sessions: Hours Arranged	Mr. Porter

## Wood and Paper Science

WPS 205	WOOD MACHINING PRACTICUM	1
	WST Summer Practicum	
	<i>Prerequisite: WPS 201 or WPS 202</i>	
	First Session: 0800-1700	Mr. Gilmore
WPS 206	WOOD DRYING PRACTICUM	1
	WST Summer Practicum	
	<i>Prerequisite: WPS 201 or WPS 202</i>	
	First Session: 0800-1700	Mr. Carter

WPS 207	GLUING PRACTICUM WST Summer Practicum <i>Prerequisite: WPS 201 or WPS 202</i> First Session: 0800-1700	1    Messrs. Carter, Gilmore, Graduate Assistant
WPS 208	WOOD FINISHING PRACTICUM WST Summer Practicum <i>Prerequisite: WPS 201 or WPS 202</i> First Session: 0800-1700	1    Mr. Carter
WPS 209	PLANT INSPECTIONS WST Summer Practicum <i>Prerequisite: WPS 201 or WPS 202</i> First Session: 0800-1700	1    Mr. Carter
WPS 210	FOREST PRODUCTS INTERNSHIP <i>Prerequisite: Completion of summer practicum</i> First Session: 0800-1700	1
WPS 491 (FOR 491)	SENIOR PROBLEMS IN FOREST RESOURCES <i>Prerequisite: Consent of department</i> Both Sessions: Hours Arranged	- Credits Arranged  Mr. Carter
WPS 492 (FOR 492)	SENIOR PROBLEMS IN FOREST RESOURCES <i>Prerequisite: Consent of department</i> Both Sessions: Hours Arranged	Credits Arranged  Staff
WPS 591	WOOD AND PAPER SCIENCE PROBLEMS <i>Prerequisite: Senior or graduate standing</i> Both Sessions: Hours Arranged	Credits Arranged  Staff
WPS 699	PROBLEMS IN RESEARCH <i>Prerequisite: Graduate standing</i> Both Sessions: Hours Arranged	Credits Arranged  Staff

## Zoology

BS 100	GENERAL BIOLOGY (See biological sciences, page 29.)	4
ZO 201	ANIMAL LIFE <i>Prerequisite: BS 100</i> The biology of the major groups of animals, with emphasis on general structural plans and diversity, reproduction, development, ecology, behavior and evolution. First Session: LR 0800-0930; LB 1340-1750 MW	4   Mr. Eads

- ZO 221 CONSERVATION OF NATURAL RESOURCES 3  
*Prerequisite: BS 100*  
 The importance of natural resources to man and the part they play in his environment. The physical, biological and ecological principles underlying natural resources conservation with particular attention given to the biological consequences of overexploitation and environmental pollution.  
 First Session: 1140-1310 Mr. Eads
- ZO 360 (BO 360) INTRODUCTION TO ECOLOGY 4  
*Prerequisite: BS 100*  
 The study of the relationships between organisms and their environment and of interaction among organisms. A balanced perspective in the basic principles of ecology and in their importance to man and his environment is presented. Content includes: ecosystems (energy flow and nutrient cycles); pollution; environment-organism interactions; population dynamics; interspecies ecology; communities; world biomes and paleoecology; and applied ecology.  
 First Session: LR 0800-0930; LB 1340-1750 TT Mr. Funderburg
- ZO 560 (BO 560) PRINCIPLES OF ECOLOGY 4  
*Prerequisite: Three semesters of college-level biology courses*  
 A consideration of the principles of ecology at the graduate level. Each of the major subject areas of ecology is developed in sufficient depth to provide a factual and philosophical framework for the understanding of ecology.  
*Students desiring to take a special three-week course must register through the Department of Adult and Community College Education. Special applications may be obtained from Dr. Robert J. Dolan, Professor of Adult and Community College Education, 310 Poe Hall. Students must use this special application rather than register through regular procedures. Applications must be submitted by Friday, June 4. Special three-week session (June 21-July 9): Hours Arranged*  
 Mr. Funderburg
- ZO 590 SPECIAL STUDIES Credits Arranged  
*Prerequisites: Twelve hours in zoology, consent of instructor*  
 The investigation of a particular problem in zoology. A maximum of three semester hours is allowed toward a degree.  
 Both Sessions: Hours Arranged Graduate Staff
- ZO 592 TOPICAL PROBLEMS 1-3  
*Prerequisite: Consent of instructor*  
 Organized, formal lectures and discussions of a special topic.  
 Both Sessions: Hours Arranged Graduate Staff
- ZO 699 RESEARCH IN ZOOLOGY Credits Arranged  
*Prerequisites: Twelve hours in zoology, consent of instructor*  
 Original research related to a student's thesis. A maximum of six hours is allowed toward the master's degree; any number toward the doctorate.  
 Both Sessions: Hours Arranged Graduate Staff



## UNIVERSITY DISRUPTIONS POLICY AND PROCEDURES

The following statement is from the University By-Laws as established by the Board of Trustees:

### SEC. 5-1. Definition of Disruptive Conduct

The University of North Carolina has long honored the right of free discussion and expression, peaceful picketing and demonstrations, the right to petition and peaceably to assemble. That these rights are a part of the fabric of this institution is not questioned. They must remain secure. It is equally clear, however, that in a community of learning, willful disruption of the educational process, destruction of property, and interference with the rights of other members of the community cannot be tolerated.

(a) Any student, faculty member (including full-time or part-time instructor), or employee who willfully by use of violence, force, coercion, threat, intimidation of fear, obstructs, disrupts or attempts to obstruct or disrupt, the normal operations or functions of any of the component institutions of the University, or who advises, procures, or incites others to do so, shall be subject to suspension, expulsion, discharge, or dismissal from the University. The following, while not intended to be exclusive, illustrate the offenses encompassed herein: occupation of any University building or part thereof with intent to deprive others of its use; blocking the entrance or exit of any University building or corridor or room therein; setting fire to or by any other means substantially damaging any University building or property, or the property of others on University premises; except as necessary for law enforcement, any display of or attempt or threat to use firearms or explosives or for the purpose of intimidating, other weapons, in any University building or on any University campus; prevention of the convening, continuation or orderly conduct of any University class or activity or of any lawful meeting or assembly in any University building or on any University campus; inciting or organizing attempts to prevent student attendance at classes; and, except with the permission of the Chancellor, blocking normal pedestrian or vehicular traffic on any University campus.

(b) Any faculty member (including any full-time or part-time instructor) who, with intent to obstruct or disrupt the normal operations or functions of any of the component institutions of the University, willfully fails or refuses to carry out validly assigned duties shall be subject to discharge.

### SEC. 5-2. Responsibility of Chancellor

(a) The Chancellor or his representatives shall have a duty to identify persons who violate the provisions of Sections 5-1 (a) or (b) and promptly report their names to the President. In any such instance the Chancellor or his representative shall marshal the evidence, and the Chancellor shall report it to the President in writing.

(b) The Chancellor or his representative may recommend to the President that injunctive relief be sought from the courts to prevent occurrence, continuation, or recurrence of a violation of Section 5-1 (a).

#### SEC. 5-3. Responsibility of the President

When it appears that there is a violation of Sections 5-1 (a) or (b), it shall be the duty of the President, and he is fully authorized to act, to take all steps which he deems advisable to protect the best interest of the University of North Carolina and any of its component institutions, and to see that its Rules, Regulations and Policies are enforced. He shall insure that any person or persons found guilty after proper hearing shall be disciplined in such manner as may be warranted.

In carrying out these duties, the President may call upon any Chancellor, member of the University Administration, or member of the Faculty, and he may call upon any agency of a component institution created to deal with cases arising under Section 5-1 of these By-Laws. Conviction in any State or Federal Court shall not preclude the University from exercising its disciplinary authority in any offense under this or any other section of the By-Laws.

#### SEC. 5-4. Responsibility of the Trustees

The Trustees recognize that by statute they have the power to make such rules and regulations for the management of the University as they may deem necessary and expedient, not inconsistent with the constitution and laws of the State. While the Trustees fully appreciate their obligation in this respect, they further recognize that in dealing with those offenses against the University defined in Section 5-1 (a) and (b) hereof, they must impose the duty and authority of enforcing the policies set forth herein in the principal Executive Officer of the University—the President. It will be the responsibility of the Trustees to furnish all possible assistance to the President when requested by him.

#### SEC. 5-5. No Amnesty

No administrative official, faculty member, student, or employee of the University shall have authority to grant amnesty or to make any promise as to prosecution or nonprosecution in any court, state or federal, or before any student, faculty, administrative, or Trustee committee to any person charged with or suspected of violating Section 5-1 (a) or (b) of these By-Laws.

#### SEC. 5-6. Firearms and Other Weapons Prohibited

The possession of bowie knives, dirks, daggers, loaded canes, sword canes, machetes, pistols, rifles, repeating rifles, shotguns, pump guns, or other firearms or explosives upon any University campus or in any University owned or operated facility, unless explicitly permitted by the appropriate Chancellor or his designated representative in writing, is forbidden. Violation of this prohibition constitutes grounds for suspension from the University.

# SUMMER SESSIONS FACULTY

## A

- DEWEY ALLEN ADAMS, Ed.D., *Associate Professor of Adult and Community College Education.*  
DONALD BRANT ADCOCK, M.A., *Assistant Director of Music.*  
ELSAYED M. AFIFY, Ph.D., *Visiting Associate Professor of Mechanical and Aerospace Engineering.*  
FRED J. ALLRED, Ph.D., *Associate Professor of Modern Languages.*  
RAUL EDUARDO ALVAREZ, M.S., *Associate Professor of Industrial Engineering.*  
MICHAEL AMEIN, Ph.D., *Professor of Civil Engineering.*  
CHARLES EUGENE ANDERSON, Ph.D., *Associate Professor of Botany.*  
CHARLES NOEL ANDERSON, M.E., *Assistant Professor of Mathematics.*  
CLIFTON A. ANDERSON, Ph.D., *Professor of Industrial Engineering and Head of the Department.*  
NORMAN DEAN ANDERSON, Ph.D., *Associate Professor of Science Education.*  
ROY NELS ANDERSON, Ph.D., *Professor of Education.*  
FRANK BRADLEY ARMSTRONG, Ph.D., *University Professor of Biochemistry, Genetics and Microbiology.*  
LEONARD WILLIAM AURAND, Ph.D., *Professor of Food Science and Biochemistry.*  
CHARLES WILSON AVERRE, III, Ph.D., *Extension Assistant Professor of Plant Pathology.*  
ROBERT AYCOCK, Ph.D., *Professor of Plant Pathology and Horticultural Science.*

## B

- WILLARD FARRINGTON BABCOCK, S.M., *Professor of Civil Engineering.*  
JOHN ALBERT BAILEY, Ph.D., *Associate Professor of Mechanical and Aerospace Engineering.*  
CLIFFORD HOWARD BAKER, M.S., *Instructor in Economics.*  
HERSHELL RAY BALL, JR., Ph.D., *Assistant Professor of Food Science.*  
JAMES RODERICK BANKER, M.A., *Instructor in History.*  
ALDOS CORTEZ BAREFOOT, JR., D.F., *Professor of Wood and Paper Science.*  
JERRY WILLIAM BARKER, M.S., *Instructor in Physical Education.*  
KENNETH REECE BARKER, Ph.D., *Associate Professor of Plant Pathology.*  
GEORGE OATES BATTON, B.S.M.E., *Instructor in Mechanical and Aerospace Engineering.*  
EDWARD ELTON BEAN, M.A., *Instructor in Modern Languages.*  
THOMAS ALEXANDER BELL, M.S., *Professor (USDA) of Food Science.*  
WILLARD HARRISON BENNETT, Ph.D., *Burlington Professor of Physics.*  
HENRY ALBERT BENT, Ph.D., *Professor of Chemistry.*  
LEONIDAS JUDD BETTS, JR., Ed.D., *Associate Professor of English and Education.*  
MARVIN KENNETH BEUTE, Ph.D., *Assistant Professor of Plant Pathology.*  
JOHN WILLIAM BISHIR, Ph.D., *Professor of Mathematics.*  
THOMAS JACKS BLALOCK, M.A., *Assistant Professor of Chemistry.*  
PHILIP EVERFTT BLANK, JR., Ph.D., *Associate Professor of English.*  
MILTON CLAY BLISS, M.A., *Assistant Director of Music.*  
UDO BLUM, Ph.D., *Assistant Professor of Botany.*  
THOMAS NELSON BLUMER, Ph.D., *Professor of Food Science.*  
EDGAR J. BOONE, Ph.D., *Professor of Adult and Community College Education and Head of the Department.*  
JON BORDNER, Ph.D., *Assistant Professor of Chemistry.*  
CAREY HOYT BOSTIAN, Ph.D., *Professor of Genetics.*

LAWRENCE HOFFMAN BOWEN, Ph.D., *Professor of Chemistry.*  
 WORTH BYRON BOWMAN, II, M.S., *Instructor in Physics.*  
 V. MILTON BOYCE, Ed.D., *Visiting Professor of Adult and Community College Education.*  
 ROBERT AMMON BRADY, M.S., *Instructor in Botany.*  
 EDWARD HOSMER BRADFORD, B.T.E., *Research Associate Professor of Textile Technology.*  
 CHARLES RAYMOND BRAMER, E.M., *Riddick Professor of Civil Engineering.*  
 DOROTHY LAMBECK BRANT, M.A., *Instructor in Mathematics.*  
 VESTER ROBERTSON BRANTLEY, M.A., *Assistant Professor of Mathematics.*  
 PAUL ARNOLD BREDENBERG, Ph.D., *Professor of Philosophy and Religion.*  
 ROBERT CURTIS BRISSON, Ph.D., *Assistant Professor of Sociology and Anthropology.*  
 MINNIE M. BROWN, M.S., *State Agent in Home Economics in the Agricultural Extension Service.*  
 ROBERT SEDGWICK BRYAN, Ph.D., *Professor of Philosophy and Head of the Department of Philosophy and Religion.*  
 CHARLES DOUGLAS BRYANT, Ed.D., *Assistant Professor of Agricultural Education.*  
 RALPH CLEMENT BRYANT, Ph.D., *Professor of Forestry.*  
 ROBERTS COZART BULLOCK, Ph.D., *Professor of Mathematics.*  
 CARL LEE BUMGARDNER, Ph.D., *Professor of Chemistry.*  
 ERNEST EDMUND BURNISTON, Ph.D., *Associate Professor of Mathematics.*

## C

LEON RAYMOND CAMP, Ph.D., *Associate Professor of English.*  
 THELMA JOYCE CARAWAY, M.A., *Assistant Professor of Mathematics.*  
 HALBERT HART CARMICHAEL, Ph.D., *Associate Professor of Chemistry.*  
 DANIEL EDWARD CARROLL, JR., Ph.D., *Assistant Professor of Food Science.*  
 ROY MERWIN CARTER, M.S., *Professor of Wood and Paper Science.*  
 THOMAS COURTNEY CAVES, Ph.D., *Assistant Professor of Chemistry.*  
 LARRY STEPHEN CHAMPION, Ph.D., *Professor of English and Head of the Department.*  
 RICHARD EDWARD CHANDLER, Ph.D., *Associate Professor of Mathematics.*  
 HOU-MIN CHANG, Ph.D., *Assistant Professor of Wood and Paper Science.*  
 HARVEY JOHNSON CHARLTON, Ph.D., *Assistant Professor of Mathematics.*  
 JOHN ALLEN CHRISTIAN, M.S., *Extension Professor of Food Science and Extension Administrative Coordinator.*  
 KWONG TUZZ CHUNG, Ph.D., *Assistant Professor of Physics.*  
 ROBERT JEROLD CLACK, Ph.D., *Visiting Assistant Professor of University Studies.*  
 THOMAS EUGENE CLARK, Ph.D., *Assistant Professor of Sociology and Anthropology.*  
 JOSEPH RAY CLARY, Ph.D., *Adjunct Associate Professor of Education.*  
 CARLYLE NEWTON CLAYTON, Ph.D., *Professor of Plant Pathology.*  
 MAURICE HILL CLAYTON, Ph.D., *Associate Professor of Engineering Mechanics.*  
 GROVER CLEVELAND COBB, JR., Ph.D., *Associate Professor of Physics.*  
 JAMES LAWRENCE COLE, Ph.D., *Associate Professor of Psychology.*  
 DANIEL FRANCIS COLLINS, M.A., *Assistant Professor of Sociology and Anthropology.*  
 NEWTON VAUGHAN COLSTON, JR., Ph.D., *Assistant Professor of Civil Engineering.*  
 JOHN OLIVER COOK, Ph.D., *Professor of Psychology.*  
 HENRY CHARLES COOKE, M.S., *Associate Professor of Mathematics.*  
 ARTHUR WELLS COOPER, Ph.D., *Professor of Botany and Forest Resources.*  
 HAROLD MAXWELL CORTER, Ph.D., *Professor of Psychology.*  
 ELLIS BREVIER COWLING, Ph.D., *Professor of Plant Pathology, Forestry and Wood and Paper Science.*  
 WALTER L. COX, JR., M.A., *Instructor in Education.*  
 PAUL DAY CRIBBINS, Ph.D., *Professor of Civil Engineering.*

- HENRY LELAND CROUCH, JR., M.A.T., *Instructor in Mathematics.*  
JOHNNY LEE CROW, M.S., *Instructor in Engineering Graphics.*

D

- RAGHUNATH SINGH DAHIYA, Ph.D., *Assistant Professor of Food Science.*  
JOHN MICHAEL ANTHONY DANBY, Ph.D., *Professor of Mathematics and Physics.*  
EDMUND PENDLETON DANDRIDGE, JR., Ph.D., *Associate Professor of English.*  
STYLIANOS D. DANIELOPOULOS, Ph.D., *Visiting Assistant Professor of Computer Science.*  
JERRY MONROE DANIELS, M.A., *Assistant Professor of Physical Education.*  
DONALD GOULD DAVENPORT, Ph.D., *Associate Professor of Animal Science.*  
CHARLES BINGHAM DAVEY, Ph.D., *Professor of Forestry and Soil Science and Head of the Department of Forestry.*  
PHILLIP HARVEY DAVIS, M.A., *Associate Professor of English.*  
HAROLD LEROY DAVISON, M.A.T., *Instructor in Mathematics.*  
DONALD LEE DEAN, Ph.D., *Professor of Civil Engineering and Head of the Department.*  
M. KEITH DEARMOND, Ph.D., *Associate Professor of Chemistry*  
FRED ROARK DEJARNETTE, Ph.D., *Associate Professor of Mechanical and Aerospace Engineering.*  
GEORGE OSMORE DOAK, Ph.D., *Professor of Chemistry.*  
WALTER JEROME DOBROGOSZ, Ph.D., *Associate Professor of Microbiology.*  
WESLEY OSBORNE DOGGETT, Ph.D., *Professor of Physics.*  
ROBERT JOHN DOLAN, Ph.D., *Professor of Adult and Community College Education.*  
WILLIAM GRADY DOTSON, JR., Ph.D., *Associate Professor of Mathematics.*  
LAWRENCE WILLIAM DRABICK, Ph.D., *Associate Professor of Sociology and Anthropology.*  
FREDERICK RICHARD DREWS, Pe.D., *Professor of Physical Education and Head of the Department.*  
LOUIS BYNUM DRIGGERS, M.S., *Extension Associate Professor of Biological and Agricultural Engineering.*  
JOHN WARREN DUFFIELD, Ph.D., *Professor of Forestry and Genetics.*  
HARRY ERNEST DUNCAN, Ph.D., *Extension Associate Professor of Plant Pathology and In Charge of Plant Extension.*

E

- JOHN BYNUM EASLEY, M.A., *Associate Professor of English.*  
WILLIAM TAYLOR EASTER, M.S., *Assistant Professor of Electrical Engineering and Director of Engineering Operations.*  
EDDIE ECHANDI, Ph.D., *Professor of Plant Pathology.*  
JENNINGS BRYAN EDWARDS, JR., M.A., *Associate Professor of Physical Education.*  
JOHN AUERT EDWARDS, Ph.D., *Professor of Engineering Mechanics.*  
MAGDI MOHAMED EL-KAMMASH, Ph.D., *Associate Professor of Economics*  
GERALD HUGH ELKAN, Ph.D., *Professor of Microbiology.*  
DON EDWIN ELLIS, Ph.D., *Professor of Plant Pathology and Head of the Department.*  
WALTER GLENN ELLIS, M.P.A., *Assistant Professor of Politics.*  
ERIC LOUIS ELLWOOD, Ph.D., *Professor of Wood and Paper Science and Dean of the School of Forest Resources.*  
JOHN FREDRICK ELY, Ph.D., *Associate Professor of Civil Engineering and Engineering Mechanics.*  
LEON MARTIN ENNIS, JR., Ph.D., *Assistant Professor of Economics.*  
EDWARD WALTER ERICKSON, Ph.D., *Associate Professor of Economics.*

JOHN LINCOLN ETCHELLS, Ph.D., *Professor (USDA) of Food Science and Microbiology.*  
JAMES BRAINERD EVANS, Ph.D., *Professor of Microbiology and Head of the Department.*  
FRIEDRICH GUSTAV EVERLING, Ph.D., *Associate Professor of Physics.*

## F

ABDEL-AZIZ FAHMY, Ph.D., *Professor of Materials Engineering.*  
MAURICE HUGH FARRIER, Ph.D., *Associate Professor of Forestry and Entomology.*  
GARY LOTTRIDGE FAULKNER, M.A., *Assistant Professor of Sociology and Anthropology.*  
THOMAS P. FEENY, Ph.D., *Assistant Professor of Modern Languages.*  
CLARENCE MEADD FERGUSON, B.S.A., *Visiting Professor Emeritus of Adult and Community College Education.*  
GEORGE ALEXANDER FINLEY, M.S., *Instructor in Freshman Engineering.*  
ROGER CARL FITES, Ph.D., *Assistant Professor of Botany.*  
WALTER CURTIS FITZGERALD, JR., B.D., *Assistant Professor of Philosophy and Religion.*  
DENNIS BROADUS FLANNAGAN, M.S., *Instructor in Computer Science.*  
HENRY PRIDGEN FLEMING, Ph.D., *Associate Professor (USDA) of Food Science.*  
ROBERT JOSEPH FORNARO, Ph.D., *Assistant Professor of Computer Science.*  
WILLIAM GLENWOOD FRANKLIN, Ph.D., *Associate Professor of English.*  
LEON DAVID FREEDMAN, Ph.D., *Professor of Chemistry.*  
JOHN FRINK FREEMAN, B.S., *Instructor in Engineering Graphics.*  
RONALD OWEN FULP, Ph.D., *Associate Professor of Mathematics.*  
JOHN B. FUNDERBURG, JR., Ph.D., *Visiting Professor of Adult and Community College Education.*

## G

WILLIAM SYLVAN GALLER, Ph.D., *Associate Professor of Civil Engineering.*  
THOMAS DEAN GARDNER, Ph.D., *Visiting Assistant Professor of Psychology.*  
DENNIS EVO GAROUTTE, Ph.D., *Assistant Professor of Mathematics.*  
RALPH GELLAR, Ph.D., *Visiting Assistant Professor of Mathematics.*  
THOMAS GEMMER, B.S., *Teaching Technician in Forestry and Wood and Paper Science.*  
FORREST WILLIAM GETZEN, Ph.D., *Associate Professor of Chemistry.*  
JOHN HENDERSON GILBERT, Ph.D., *Assistant Professor of Politics.*  
STANLEY EUGENE GILLILAND, Ph.D., *Assistant Professor of Food Science.*  
ROBERT C. GILMORE, M.W.S., *Assistant Professor of Wood and Paper Science.*  
CHESTER EUGENE GLEIT, Ph.D., *Associate Professor of Chemistry.*  
RAYMOND PAUL GOGOLEWSKI, Ph.D., *Assistant Professor of Engineering Mechanics.*  
GABRIEL GONZALEZ, Ph.D., *Assistant Professor of Modern Languages.*  
GUY VERNON GOODING, JR., Ph.D., *Associate Professor of Plant Pathology.*  
THOMAS FREDERICK GORDON, M.A.T., *Instructor in Mathematics.*  
GUY GRAN, M.A., *Instructor in History.*  
LARRY FRANK GRAND, Ph.D., *Assistant Professor of Plant Pathology and Forestry.*  
MAX EDWIN GREGORY, Ph.D., *Extension Professor of Food Science.*  
THOMAS JAMES GRENNES, M.A., *Assistant Professor of Economics.*  
WILLIAM S. GRIFFITH, Ph.D., *Visiting Professor of Adult and Community College Education.*  
EDWARD DEWITT GURLEY, Ph.D., *Associate Professor of Engineering Mechanics.*  
ROBERT GRANT GWYN, M.A.T., *Instructor in Physical Education.*

- WILLIAM LEROY HAFLEY, Ph.D., *Associate Professor of Forestry and Statistics.*  
 FRANCIS JOSEPH HALE, Sc.D., *Professor of Mechanical Engineering.*  
 GEORGE LINCOLN HALL, Ph.D., *Professor of Physics.*  
 MAX HALPEREN, Ph.D., *Associate Professor of English.*  
 DONALD DALE HAMANN, Ph.D., *Associate Professor of Food Science and Biological and Agricultural Engineering.*  
 PAT BROOKS HAMILTON, Ph.D., *Associate Professor of Microbiology and Poultry Science.*  
 KENNETH WILLIAM HANCK, Ph.D., *Assistant Professor of Chemistry.*  
 ARTHUR PAUL HANSEN, Ph.D., *Assistant Professor of Food Science.*  
 DONALD JOSEPH HANSEN, Ph.D., *Assistant Professor of Mathematics.*  
 DURWIN MELFORD HANSON, Ph.D., *Professor of Industrial and Technical Education and Head of the Department.*  
 JAMES WILLIAM HANSON, M.A., *Assistant Professor of Computer Science.*  
 JOHN J. HARDER, Dr. Ing., *Associate Professor of Industrial Engineering.*  
 JAMES WALKER HARDIN, Ph.D., *Professor of Botany and Forest Resources.*  
 HARRY ALLEN HARGRAVE, Ph.D., *Assistant Professor of English.*  
 CLEON WALLACE HARRELL, M.A., *Associate Professor of Economics.*  
 WALTER JOEL HARRINGTON, Ph.D., *Professor of Mathematics.*  
 CLARENCE ARTHUR HART, Ph.D., *Professor of Wood and Paper Science.*  
 ROBERT EDUARD HARTWIG, Ph.D., *Assistant Professor of Mathematics.*  
 WAYNE EARLE HASKIN, M.A., *Instructor in English.*  
 KERRY SHUFORD HAVNER, Ph.D., *Associate Professor of Civil Engineering.*  
 ARTHUR COURTNEY HAYES, M.S., *Associate Professor of Textile Chemistry.*  
 EDWARD CHARLES HAYES, III, Ph.D., *Assistant Professor of Microbiology.*  
 MARY KALEEL HEAD, Ph.D., *Visiting Extension Assistant Professor of Food Science.*  
 WILLIAM JOSEPH HEAD, Ph.D., *Assistant Professor of Civil Engineering.*  
 ALLEN STRETLER HEAGLE, Ph.D., *Adjunct Assistant Professor of Plant Pathology.*  
 CERRILL PAUL HEATON, Ph.D., *Assistant Professor of English.*  
 TEDDY THEODORE HEBERT, Ph.D., *Professor of Plant Pathology and Genetics.*  
 CLINTON LOUIS HEIMBACH, Ph.D., *Professor of Civil Engineering.*  
 FORREST CLYDE HENTZ, JR., Ph.D., *Associate Professor of Chemistry.*  
 GEORGE HENRY HEPTING, Ph.D., *Adjunct Professor of Plant Pathology and Forestry.*  
 SOLOMON PHILIP HERSH, Ph.D., *Professor of Textile Technology.*  
 WILLIAM LAWRENCE HIGHFILL, Ph.D., *Associate Professor of Philosophy and Religion.*  
 CHARLES HORACE HILL, Ph.D., *Professor of Poultry Science and Animal Science.*  
 ROBERT GRANT HITCHINGS, Ph.D., *Professor of Pulp and Paper Technology and In Charge of Pulp and Paper Technology.*  
 GEORGE BURNHAM HOADLEY, D.Sc., *Professor of Electrical Engineering and Head of the Department.*  
 JOSEPH PATRICK HOBBS, Ph.D., *Assistant Professor of History.*  
 CHARLES SASNETTE HODGES, JR., Ph.D., *Professor (USDA) of Plant Pathology and Forestry.*  
 ROBERT LEWIS HOFFMAN, M.A., *Instructor in University Studies.*  
 WILLIAM MCFALL HOLLER, M.A., *Instructor in Modern Languages.*  
 ABRAHAM HOLTZMAN, Ph.D., *Professor of Politics.*  
 RUTH BALL HONEYCUTT, M.A., *Assistant Professor of Mathematics.*  
 MAURICE WILLIAM HOOVER, Ph.D., *Professor of Food Science.*  
 WILLIAM ERNEST HOPKE, Ed.D., *Professor of Guidance and Personnel Services and Head of the Department.*  
 JOHN WILLIAM HORN, M.S.C.E., *Professor of Civil Engineering.*

HORACE ROBERT HORTON, Ph.D., *Associate Professor of Biochemistry.*  
Z ZIMMERMAN HUGUS, JR., Ph.D., *Professor of Chemistry and Head of the Department.*  
DONALD HUISINGH, Ph.D., *Associate Professor of Plant Pathology.*  
JAMES ERNEST HUNEYCUTT, JR., Ph.D., *Assistant Professor of Mathematics.*  
MORADA ALICE HUNT, LL.B., *Special Lecturer in Economics.*  
ELVAN EDWARD HUTCHISON, M.S., *Research Assistant Professor of Textile Technology.*  
THEODORE MARTIN HYMAN, Ph.D., *Assistant Professor of Sociology and Anthropology.*

## I

WILLIAM PRENTISS INGRAM, JR., Ph.D., *Assistant Professor of Chemistry and Administrative Assistant.*

## J

ALVIN WILKINS JENKINS, JR., Ph.D., *Professor of Physics.*  
SAMUEL FOREST JENKINS, JR., Ph.D., *Associate Professor of Plant Pathology.*  
LAURENS GIFFORD JERVIS, B.S., *Research Associate in Forest Research.*  
BOBBY RAY JOHNSON, Ph.D., *Assistant Professor of Food Science.*  
JOSEPH CLYDE JOHNSON, Ed.D., *Professor of Psychology.*  
WILLIAM RODGERS JOHNSTON, M.S., *Instructor in Chemistry.*  
CHARLES PARKER JONES, Ph.D., *Assistant Professor of Economics.*  
LOUIS ALLMAN JONES, Ph.D., *Associate Professor of Chemistry.*  
VICTOR ALAN JONES, Ph.D., *Associate Professor of Food Science and Biological and Agricultural Engineering.*

## K

JOSEPH STEPHAN KAHN, Ph.D., *Associate Professor of Biochemistry and Botany.*  
AMIN M. KAMAL, Ph.D., *Associate Professor of Industrial Engineering.*  
EUGENE JOHN KAMPRATH, Ph.D., *Professor of Soil Science.*  
ABDEL-AZIZ ISMAIL KASHEF, Ph.D., *Professor of Civil Engineering.*  
GERALD HOWARD KATZIN, Ph.D., *Associate Professor of Physics.*  
HAROLD KEATING, M.Ed., *Associate Professor of Physical Education.*  
ROBERT CLAY KELLISON, M.S., *Liaison Geneticist in Forestry.*  
DONALD LYNN KELLY, B.S., *Lecturer in the Freshman Engineering Division.*  
HENDERSON GRADY KINCHELOE, Ph.D., *Professor of English.*  
DAVID MCKENDREE KLINE, Ph.D., *Professor (USDA) of Plant Pathology.*  
DONALD ROBERT KLOE, M.A., *Assistant Professor of Modern Languages.*  
GEORGE FRANKLIN KNIGHT, M.A., *Instructor in Mathematics.*  
RICHARD BENNETT KNIGHT, M.S., *L.L. Vaughan Professor of Mechanical Engineering.*  
JAMES ARTHUR KNOPP, Ph.D., *Assistant Professor of Biochemistry.*  
ALBERT SIDNEY KNOWLES, M.A., *Associate Professor of English.*  
STEPHEN DOUGLAS KOCH, Ph.D., *Assistant Professor of Botany.*  
JEROME WILLIAM KOENIGS, Ph.D., *Adjunct Associate Professor of Plant Pathology and Forestry.*  
KWANGIL KOH, Ph.D., *Professor of Mathematics.*  
JOHN RONALD KOLB, Ph.D., *Associate Professor of Mathematics and Mathematics and Science Education.*  
BENJAMIN GRANADE KOONCE, JR., Ph.D., *Professor of English.*  
WALTER KOSMIN, M.A., *Instructor in Modern Languages.*  
KNUT PAUL KRINGSTAD, Ph.D., *Associate Professor of Wood and Paper Science.*



- GEORGE JAMES KRIZ, Ph.D., *Associate Professor of Biological and Agricultural Engineering and Soil Science and Associate Department Head In Charge of Extension.*
- ELMER GEORGE KUHLMAN, Ph.D., *Adjunct Associate Professor of Plant Pathology and Forestry.*

## L

- FRED LADO, JR., Ph.D., *Assistant Professor of Physics.*
- JOE OSCAR LAMMI, Ph.D., *Professor of Forestry.*
- CHESTER GREY LANDES, B.S.Ch.E., *Associate Professor of Wood and Paper Science.*
- LEONARD JAY LANGFELDER, Ph.D., *Associate Professor of Civil Engineering.*
- KURT JOHN LEONARD, Ph.D., *Assistant Professor (USDA) of Plant Pathology.*
- JACK LEVINE, Ph.D., *Professor of Mathematics.*
- SAMUEL GALE LEVINE, Ph.D., *Professor of Chemistry.*
- CHARLES FREDERICK LEWIS, M.A., *Assistant Professor of Mathematics.*
- CHARLES HOWIE LITTLE, JR., M.A., *Associate Professor of Mathematics.*
- RICHARD HENRY LOEPPERT, Ph.D., *Professor of Chemistry and Assistant to the Head of the Department.*
- GEORGE GILBERT LONG, Ph.D., *Professor of Chemistry.*
- IAN STEWART LONGMUIR, M.B.B., *Professor of Biochemistry.*
- JOSEPH WILLIAM LOVE, Ph.D., *Extension Professor of Horticultural Science.*
- ROBERT E. LUBOW, Ph.D., *Associate Professor of Psychology.*
- GEORGE BLANCHARD LUCAS, Ph.D., *Professor of Plant Pathology.*
- LEON THOMAS LUCAS, Ph.D., *Assistant Professor of Plant Pathology.*
- JIANG LUH, Ph.D., *Associate Professor of Mathematics.*

## M

- JERRY LEE MACHEMEHL, Ph.D., *Assistant Professor of Civil Engineering.*
- CLARENCE JOSEPH MADAY, Ph.D., *Associate Professor of Engineering Mechanics.*
- STEPHEN J. MADDOCK, M.A., *Visiting Lecturer in University Studies.*
- ALEXANDER RUSSELL MAIN, Ph.D., *Professor of Biochemistry.*
- CHARLES EDWARD MAIN, Ph.D., *Assistant Professor of Plant Pathology.*
- T. EWALD MAKI, Ph.D., *Carl Schenck Professor of Forestry.*
- ARMSTRONG MALTBIE, B.S., *Assistant Professor of Mathematics.*
- ELIZABETH HINES MANNING, A.B., *Instructor in Chemistry.*
- EDWARD RAYMOND MANNING, Ph.D., *Professor of Physics.*
- WILLIAM PAUL MARLEY, Ph.D., *Assistant Professor of Physical Education.*
- JOE ALTON MARLIN, Ph.D., *Associate Professor of Mathematics.*
- CULPEPPER PAUL MARSH, M.S., *Professor of Sociology and Anthropology.*
- DAVID HAMILTON MARTIN, M.S., *Associate Professor of Physics.*
- ROBERT H. MARTIN, JR., Ph.D., *Assistant Professor of Mathematics.*
- JOSEPH PAUL MASTRO, M.A., *Instructor in Politics.*
- GENNARD MATRONE, Ph.D., *William Neal Reynolds Professor of Biochemistry and Animal Science and Head of the Department of Biochemistry.*
- ROBERT BARTON MCBURNEY, JR., M.B.A., *Instructor in Economics.*
- JACKSON MEARNs McCCLAIN, Ph.D., *Assistant Professor of Politics.*
- RALPH JOSEPH MCCrackEN, Ph.D., *Professor of Soil Science and Assistant Director of Research for the School of Agriculture and Life Sciences.*
- KATHLEEN A. MCCUTCHEN, M.A., *Instructor in Education.*
- LELAND KITCHEN McDOWELL, Ph.D., *Assistant Professor of Computer Science and Mathematics.*
- WILLIAM THOMAS MCKEAN, JR., Ph.D., *Associate Professor of Wood and Paper Science.*
- FRANCIS EDWARD McVAY, Ph.D., *Professor of Statistics.*

JASPER DURHAM MEMORY, Ph.D., *Professor of Physics and Assistant Dean of the School of Physical and Mathematical Sciences.*

ROBERT JACK MERCER, Ed.D., *Visiting Assistant Professor of Agricultural Education.*

MICHAEL THOMAS METTREY, Ph.D., *Adjunct Assistant Professor of Engineering Mechanics.*

ROBERT STEPHEN METZGER, Ph.D., *Associate Professor of Philosophy and Religion.*

CARL DEAN MEYER, Ph.D., *Assistant Professor of Mathematics.*

WALTER EARL MEYERS, Ph.D., *Assistant Professor of English.*

HENRY MOORE MIDDLETON, JR., B.S., *Assistant Professor of Textile Technology.*

JOSEPH LEONARD MIDDLETON, M.A., *Associate Professor of Philosophy and Religion.*

MARION LAWRENCE MILES, Ph.D., *Associate Professor of Chemistry.*

ROBERT DONALD MILHOLLAND, Ph.D., *Associate Professor of Plant Pathology.*

HOWARD GEORGE MILLER, Ph.D., *Professor of Psychology and Head of the Department.*

LATHAM LEE MILLER, M.A., *Associate Professor of Recreation Resources Administration.*

NORMAN C. MILLER, JR., M.S., *Extension Associate Professor of Food Science.*

ROBERT LOUIS MILLER, B.A., *Instructor in Industrial and Technical Education.*

JEHANGIR FARHAD MIRZA, Ph.D., *Associate Professor of Civil Engineering.*

GARY EARL MITCHELL, Ph.D., *Associate Professor of Physics.*

ROBERT JAMES MONROE, Ph.D., *Professor of Statistics.*

CATHERINE ELIZABETH MOORE, Ph.D., *Assistant Professor of English.*

CLIFFORD JAMES MOORE, JR., Ph.D., *Associate Professor of Mechanical Engineering.*

ROYALL TYLER MOORE, Ph.D., *Assistant Professor of Botany and Plant Pathology.*

CHARLES GALLOWAY MOREHEAD, Ed.D., *Professor of Guidance and Personnel Services.*

CHARLES GLFN MORELAND, Ph.D., *Associate Professor of Chemistry.*

JOHN WESLEY MORGAN, M.A., *Instructor in Chemistry.*

ROBERT LEROY MORGAN, M.A., *Research Assistant in Psychology.*

WILLIAM EDWIN MOSER, B.S., *Associate Professor of Textile Technology.*

MARVIN KENT MOSS, Ph.D., *Associate Professor of Physics.*

ROBERT LONNIE MOXLEY, Ph.D., *Assistant Professor of Sociology and Anthropology.*

WESLEY GRIGG MULLEN, Ph.D., *Professor of Civil Engineering.*

ALEXANDER GEORGE MULLIN, M.F., *Instructor in Forestry.*

ROBERT DAVID MUSTIAN, Ph.D., *Assistant Professor of Sociology and Anthropology.*

## N

HOWARD MOVESS NAHIKIAN, Ph.D., *Professor of Mathematics.*

JOSEPH TAFT NERDEN, Ph.D., *Professor of Industrial Education.*

PAUL ADRIAN NICKEL, Ph.D., *Professor of Mathematics.*

LOWELL WENDELL NIELSEN, Ph.D., *Professor of Plant Pathology.*

DEMETRIOS F. NIXON, M.A., *Instructor in History.*

GLENN RAY NOGGLE, Ph.D., *Professor of Botany and Head of the Department.*

ARNOLD RAGNVALD NOLSTAD, Ph.D., *Associate Professor of Mathematics.*

CHARLES JOSEPH NUSBAUM, Ph.D., *William Neal Reynolds Professor of Plant Pathology.*

HENRY LEE WILLIAMSON NUTTLE, Ph.D., *Assistant Professor of Industrial Engineering.*

## O

GEORGE MOTLEY OLIVER, M.S., *Instructor in Chemistry.*

BERNARD MARTIN OLSEN, Ph.D., *Professor of Economics.*

DELMAR WALTER OLSON, Ph.D., *Professor of Industrial and Technical Education and Coordinator of Graduate Studies in Industrial Arts.*  
MICHAEL PERRY O'NEIL, M.A., *Instructor in Philosophy and Religion.*  
DONALD KENNETH ORBAN, M.A., *Assistant Professor of English.*  
EDUARDO AUGUSTO OSTERGREN, M.M., *Assistant Director of Music.*  
HUBERT LOWELL OWEN, B.S., *Instructor in Physics.*  
ROBERT GUY OWENS, Ph.D., *Adjunct Professor of Plant Pathology.*

## P

LAVON BARRY PAGE, Ph.D., *Assistant Professor of Mathematics.*  
CHIA VEN PAO, Ph.D., *Assistant Professor of Mathematics.*  
JAMES EDWIN PARDUE, B.S., *Associate Professor of Textile Technology.*  
HUBERT VERN PARK, Ph.D., *Professor of Mathematics and Assistant to the Head of the Department.*  
JAE YOUNG PARK, Ph.D., *Associate Professor of Physics.*  
CHARLES ALEXANDER PARKER, Ph.D., *Professor of English.*  
GEORGE WILLIAM PARKER, III, Ph.D., *Assistant Professor of Physics.*  
CARMEN ROBERT PARKHURST, Ph.D., *Assistant Professor of Poultry Science.*  
BARBARA MITCHELL PARRAMORE, Ed.D., *Assistant Professor of Guidance and Personnel Services.*  
CARLOTTA PETERSON PATTON, B.S., *Instructor in Mathematics.*  
RICHARD ROLAND PATTY, Ph.D., *Associate Professor of Physics.*  
LALJI JAYANHLAL PAVAGADHI, Ph.D., *Assistant Professor of Mechanical and Aerospace Engineering.*  
RONALD GRAY PEARSON, B.A., *Associate Professor of Wood and Paper Science.*  
JOHN NOBLE PERKINS, Ph.D., *Professor of Mechanical Engineering.*  
RONALD WILLIAM PERO, Ph.D., *Adjunct Assistant Professor of Plant Pathology.*  
JEROME JOHN PERRY, Ph.D., *Associate Professor of Microbiology.*  
THOMAS OLIVER PERRY, Ph.D., *Professor of Forestry and Genetics.*  
DANIEL MCLEOD PETERSON, M.A., *Associate Professor of Mathematics.*  
HOWARD ALDRIDGE PETREA, M.A., *Associate Professor of Mathematics.*  
GARY GENE PHILLIPS, M.S., *Instructor in Computer Science.*  
JOSEPH ALLEN PHILLIPS, Ph.D., *Extension Associate Professor of Soil Science.*  
WILLIAM PETER PINNA, J.D., *Instructor in Economics.*  
GEORGE WAVERLY POLAND, Ph.D., *Professor of Modern Languages and Head of the Department.*  
JOSEPH ALEXANDER PORTER, JR., M.S., *Professor of Textile Technology.*  
DILLARD MARTIN POWELL, J.D., *Assistant Professor of Textile Technology.*  
JAMES DOUGLAS POWELL, Ph.D., *Assistant Professor of Computer Science.*  
NATHANIEL THOMAS POWELL, Ph.D., *Professor of Plant Pathology and Genetics.*  
ALBERT ERNEST PURCELL, Ph.D., *Professor (USDA) of Food Science.*

## Q

JOHN WILLIAM QUERRY, Ph.D., *Associate Professor of Mathematics.*  
EMILY HOTCHKISS QUINN, Ph.D., *Professor of Adult and Community College Education.*

## R

ROBERT TODD RAMSAY, Ph.D., *Assistant Professor of Mathematics.*  
HORACE DARR RAWLS, Ph.D., *Associate Professor of Sociology and Anthropology.*  
THOMAS HOWARD REGAN, Ph.D., *Assistant Professor of Philosophy and Religion.*  
WILLIS ALTON REID, Ph.D., *Professor of Chemistry.*  
RICHARD ALLYN REINERT, Ph.D., *Adjunct Associate Professor of Plant Pathology.*  
RICARDO CRANSTOUN REINOSO, B.S.B.A., *Instructor in Economics.*

MICHAEL SHANE REYNOLDS, Ph.D., *Instructor in English.*  
JOHN MARION RIDDLE, Ph.D., *Associate Professor of History.*  
MICHAEL SHANE REYNOLDS, Ph.D., *Instructor in English.*  
CHARLES N. ROGERS, B.S., *Associate Professor of Wood and Paper Science.*  
ERNEST WILLIAM ROLLINS, JR., Ph.D., *Assistant Professor of Modern Languages.*  
RHIIMAN ALFRED ROTZ, Ph.D., *Assistant Professor of History.*  
RONALD W. ROUSSEAU, Ph.D., *Assistant Professor of Chemical Engineering.*  
GEORGE DARELL RUSSELL, Ph.D., *Assistant Professor of Adult and Community  
College Education.*  
PAUL JAMES RUST, Ph.D., *Associate Professor of Education.*

## S

HERBERT ARTHUR SANDMAN, L.L.M., *Assistant Professor of Economics.*  
JOSEPH NEAL SASSER, Ph.D., *Professor of Plant Pathology.*  
ROBERT GARNER SAVAGE, M.S., *Assistant Professor of Mathematics.*  
MAN MOHAN SAWHNEY, Ph.D., *Associate Professor of Sociology and Anthropology.*  
LEROY CHARLES SAYLOR, Ph.D., *Professor of Forestry and Genetics and Assistant  
Dean of the School of Forest Resources.*  
JAN FREDERICK SCHETZINA, Ph.D., *Assistant Professor of Physics.*  
WILLIAM EDWARD SCHLENGER, M.A., *Instructor in Psychology.*  
HAROLD EUGENE SCHLICHTING, JR., Ph.D., *Associate Professor of Botany.*  
ANTON FRANZ SCHREINER, Ph.D., *Assistant Professor of Chemistry.*  
ROBERT TAYLOR SCOTT, Th.M., *Instructor in University Studies.*  
SAMUEL SCOVILLE, Ph.D., *Assistant Professor of English.*  
WAYLAND PRITCHARD SEAGRAVES, M.S., *Assistant Professor of Electrical Engineer-  
ing.*  
LOUIS WALTER SEEGER, M.A., *Professor of History and Assistant Head of the  
Department.*  
ERNEST DAVIS SENECA, Ph.D., *Assistant Professor of Botany and Soil Science.*  
HENRY ANTHONY SHANNON, Ed.M., *Associate Professor of Mathematics and  
Science Education.*  
GRAYE JOHNSON SHAW, M.S., *Instructor in Chemistry.*  
ROBERT TINSLEY SHERWOOD, Ph.D., *Professor (USDA) of Plant Pathology.*  
THOMAS CLINARD SHORE, JR., M.I.A., *Assistant Professor of Industrial and Techni-  
cal Education.*  
DOUGLAS DEAN SHORT, M.A., *Instructor in English.*  
ROBERT SILBER, Ph.D., *Assistant Professor of Mathematics.*  
EDWARD CARROLL SISLER, Ph.D., *Associate Professor of Biochemistry and Crop  
Science.*  
CHARLES SMALLWOOD, JR., M.S., *Professor of Civil Engineering.*  
ELIZABETH ANN SMALTZ, M.Ed., *Assistant Professor of Physical Education.*  
FARMER STERLING SMITH, Ed.D., *Assistant Professor of Industrial and Technical  
Education.*  
GARY WILLIAM SMITH, M.T.T., *Instructor in Textile Technology.*  
J. C. SMITH, Ph.D., *Assistant Professor of Civil Engineering.*  
NORWOOD GRAHAM SMITH, M.A., *Associate Professor of English.*  
WILLIAM EDWARD SMITH, Ed.D., *Professor of Recreation Resources Adminis-  
tration.*  
AMELIA JEAN JOHANNESSEN SMOOT, Ph.D., *Assistant Professor of English.*  
MARVIN STANLEY SOROOS, M.A., *Instructor in Politics.*  
JASON LOY SOX, JR., Ph.D., *Assistant Professor of Mathematics.*  
MARVIN LUTHER SPECK, Ph.D., *William Neal Reynolds Professor of Food Science  
and Microbiology.*

HERBERT ELVIN SPEECE, Ph.D., *Professor of Mathematics and Science Education and Mathematics and Head of the Department of Mathematics and Science Education.*

GEORGE S. SPEIDEL, JR., M.A.T., *Assistant Professor of Mathematics.*

HARVEY WESLEY SPURR, JR., Ph.D., *Associate Professor (USDA) of Plant Pathology.*

EDWARD M. STACK, Ph.D., *Professor of Modern Languages.*

CLAYTON LEE STALNAKER, B.D., *Instructor in University Studies.*

DONALD HENRY JOHN STEENSEN, Ph.D., *Assistant Professor of Forestry and Wood and Paper Science.*

ALLEN FREDERICK STEIN, Ph.D., *Assistant Professor of English.*

ROBERT ELMER STERNLOFF, Ph.D., *Associate Professor of Recreation Resources Administration.*

EDWARD HOYLE STINSON, B.S., *Instructor in Engineering Graphics.*

ERNEST LESTER STITZINGER, Ph.D., *Assistant Professor of Mathematics.*

WILLIAM CLIFTON STUCKEY, JR., M.S., *Associate Professor of Textile Technology.*

ELIZABETH MANNY SUVAL, Ph.D., *Assistant Professor of Sociology and Anthropology.*

STANLEY S. SUVAL, Ph.D., *Associate Professor of History.*

HAROLD EVERETT SWAISGOOD, Ph.D., *Associate Professor of Food Science.*

RICHARD EUGENE SYLLA, Ph.D., *Associate Professor of Economics.*

RICHARD JOSEPH SZAL, M.B.A., *Special Lecturer in Economics.*

## T

FRED RUSSELL TARVER, JR., Ph.D., *Extension Associate Professor of Food Science.*

GLENN ROY TAYLOR, M.S., *Associate Professor of Civil Engineering.*

ALAN LEE THARP, Ph.D., *Assistant Professor of Computer Science.*

ELIZABETH C. THEIL, Ph.D., *Instructor in Biochemistry.*

FRANK BANCROFT THOMAS, Ph.D., *Extension Professor of Food Science.*

RICHARD JOSEPH THOMAS, Ph.D., *Associate Professor of Wood and Paper Science and Botany.*

JAY CECIL THOMPSON, Ed.D., *Assistant Professor of History and Education.*

DAVID RONALD TILLEY, Ph.D., *Associate Professor of Physics.*

FREDERICK JOSEPH TISCHER, Ph.D., *Professor of Electrical Engineering.*

PATRICIA LYSBETH TOBIN, M.A., *Assistant Professor of Sociology and Anthropology.*

WILLIAM BELL TOOLE, III, Ph.D., *Associate Professor of English.*

SAMUEL B. TOVE, Ph.D., *Professor of Biochemistry and Animal Science.*

HEDWIG HIRSCHMANN TRIANTAPHYLLOU, Ph.D., *Professor of Plant Pathology.*

ROBERT TINNEN TROXLER, M.I.A., *Assistant Professor of Industrial Arts.*

JAMES RICHARD TROYER, Ph.D., *Professor of Botany.*

GEORGE EUGENE TUCKER, M.S., *Assistant Professor of Industrial Engineering.*

HARRY TUCKER, JR., Ph.D., *Associate Professor of Modern Languages.*

WILLIAM PRESTON TUCKER, Ph.D., *Associate Professor of Chemistry.*

CHI CHAO TUNG, Ph.D., *Associate Professor of Civil Engineering.*

CARL BYRON TURNER, Ph.D., *Associate Professor of Economics.*

## U

DAVID FREDERICK ULLRICH, Ph.D., *Assistant Professor of Mathematics.*

MEHMET ENSAR UYANIK, Ph.D., *Professor of Civil Engineering.*

ODELL UZZELL, Ph.D., *Associate Professor of Sociology and Anthropology.*

## V

- WILLIAM R. VAN DERSAL, Ph.D., *Visiting Professor of Adult and Community College Education.*  
 WILLIAM JOHN VANDERWALL, M.A., *Instructor in Engineering Graphics.*  
 ALBERT DONALD VANDEVEER, Ph.D., *Assistant Professor of Philosophy and Religion.*  
 CECIL GERALD VAN DYKE, Ph.D., *Assistant Professor of Plant Pathology and Botany.*

## W

- GEORGE HENRY WAHL, JR., Ph.D., *Associate Professor of Chemistry.*  
 HARVEY EDWARD WAHLS, Ph.D., *Professor of Civil Engineering.*  
 WILLIAM MOOD WALTER, JR., Ph.D., *Assistant Professor of Food Science.*  
 ARTHUR WALTER WALTNER, Ph.D., *Professor of Physics.*  
 THOMAS MARSH WARD, Ph.D., *Assistant Professor of Chemistry.*  
 FREDERICK GAIL WARREN, Ph.D., *Professor of Food Science.*  
 MARLIN ROGER WARREN, Dr.Rec., *Assistant Professor of Recreation Resources Administration.*  
 WILLIAM MEADE WATERS, JR., M.A., *Instructor in Mathematics and Science Education.*  
 GEORGE CARSON WATSON, M.A., *Associate Professor of Mathematics.*  
 LARRY WAYNE WATSON, Ed.D., *Assistant Professor of Mathematics and Science Education.*  
 RONALD GILBERT WEAVER, M.Ed., *Assistant Professor of Physical Education.*  
 BENJAMIN DAVIS WEBB, M.S., *Instructor in Engineering Graphics.*  
 NEIL BROYLES WEBB, Ph.D., *Associate Professor of Food Science.*  
 ALLEN HOWARD WEBER, Ph.D., *Assistant Professor of Meteorology.*  
 RONALD EARLE WELTY, Ph.D., *Associate Professor (USDA) of Plant Pathology.*  
 DENNIS WILLIAM WERTZ, Ph.D., *Assistant Professor of Chemistry.*  
 OSCAR WESLER, Ph.D., *Professor of Statistics and Mathematics.*  
 HARRY CARTER WEST, Ph.D., *Assistant Professor of English.*  
 RAYMOND CYRUS WHITE, Ph.D., *Professor of Chemistry.*  
 ROBERT BENJAMIN WHITE, JR., Ph.D., *Associate Professor of English.*  
 JAMES CLIFFORD WILLIAMS, III, Ph.D., *Professor of Mechanical Engineering.*  
 MARY CAMERON WILLIAMS, Ph.D., *Assistant Professor of English.*  
 PORTER WILLIAMS, JR., M.A., *Associate Professor of English.*  
 RICHARD HALL WILLIAMSON, B.S., *Instructor in Economics.*  
 JACK WILFRED WILSON, Ph.D., *Associate Professor of Economics.*  
 JAMES BLAKE WILSON, Ph.D., *Associate Professor of Mathematics.*  
 LOWELL SHERIDAN WINTON, Ph.D., *Professor of Mathematics.*  
 THOMAS WILMONT WOOD, Ph.D., *Professor of Economics.*  
 HAMPTON WRIGHT, M.S., *Instructor in Mathematics.*

## Y

- JAMES NEAL YOUNG, Ph.D., *Professor of Sociology and Anthropology.*  
 TALMAGE BRIAN YOUNG, Ed.D., *Associate Professor of Industrial Arts.*

## Z

- PAUL ZUNG-TEH ZIA, Ph.D., *Professor of Civil Engineering and Associate Head of the Department.*  
 BRUCE J. ZOBEL, Ph.D., *Edwin F. Conger Professor of Forestry and Genetics.*

# North Carolina State University

