

CLIFTON FORGE-COVINGTON  
COMMUNITY  
COLLEGE



A DIVISION OF  
VIRGINIA  
POLYTECHNIC  
INSTITUTE  
COMMUNITY COLLEGE SYSTEM

# Virginia Polytechnic Institute

## Clifton Forge - Covington Division

### WHERE TO WRITE FOR INFORMATION

Certain officials are listed here for the convenience of those who want to write. The list is not complete nor does it imply any order of seniority or rank.

Administration ----- Clifton Forge-Covington Division, Clifton Forge, Virginia

Director ----- Dr. Donald E. Puyear

Administration—Virginia Polytechnic Institute, Blacksburg, Va.

President ----- Dr. T. Marshall Hahn Jr.

Vice-President ----- Dr. W. W. Brandt

Finance and Business Manager ----- Stuart K. Cassell

Dean of Architecture ----- Charles Burchard

Dean of Arts and Sciences ----- Dr. Leslie F. Malpass

Dean of Engineering ----- Dr. Willis G. Worcester

Assistant Dean of Engineering ----- Dr. S. H. Byrne

Dean of Business ----- Dr. H. H. Mitchell

Dean of Agriculture ----- Dr. W. B. Bell

Director of Resident Instruction (Agriculture) ----- Dr. T. J. Horne

Dean of Home Economics ----- Dr. Laura Jane Harper

Director of Development and Public Relations ----- R. Craig Fabian

Director of Admissions and Records ----- Dr. M. P. Lacy

Director of Admissions ----- Dr. E. G. Thompson

Director of Community Colleges and General Extension Programs ----- Dr. S. B. Row

Dean of Students ----- Dr. James W. Dean



**Announcements for 1965-66**

## THE COMMUNITY COLLEGE CALENDAR

1 9 6 5

January 4, Monday—Registration for winter quarter.  
 January 5, Tuesday—Classes meet.  
 January 13, Wednesday—Last day to enter organized classes.  
 March 18, Thursday—Winter quarter examinations begin.  
 March 23, Tuesday—Examinations end. Winter quarter ends.  
 March 29, Monday—Registration for spring quarter.  
 March 30, Tuesday—Classes meet.  
 April 7, Wednesday—Last day to enter organized classes.  
 June 8, Tuesday—Spring quarter examinations begin.  
 June 12, Saturday at 12 noon—Spring examinations end.  
 June 13, Sunday—Commencement exercises. Spring quarter ends.  
 June 17, Thursday—First summer quarter begins.  
 July 24, Saturday—First summer quarter ends.  
 July 28, Wednesday—Second summer quarter begins.  
 September 3, Friday—Second summer quarter ends.  
 September 23, Thursday—Registration for fall quarter.  
 September 24, Friday—Classes meet.  
 October 2, Saturday—Last day to enter organized classes.  
 November 25, Thursday to November 28, Sunday—Thanksgiving holidays.  
 December 10, Friday—Fall quarter examinations begin.  
 December 15, Wednesday—Examinations end. Fall quarter ends.

1 9 6 6

January 3, Monday—Registration for winter quarter.  
 January 4, Tuesday—Classes meet.  
 January 12, Wednesday—Last day to enter organized classes.  
 March 15, Tuesday—Winter quarter examinations begin.  
 March 19, Saturday—Examinations end. Winter quarter ends.  
 March 28, Monday—Registration for spring quarter.  
 March 29, Tuesday—Classes meet.  
 April 6, Wednesday—Last day to enter organized classes.  
 June 7, Tuesday—Spring quarter examinations begin.  
 June 11, Saturday at 12 noon—Spring quarter examinations end.  
 June 12, Sunday—Commencement exercises. Spring quarter ends.  
 June 16, Thursday—First summer term begins.  
 July 23, Saturday—First summer term ends.  
 July 27, Wednesday—Second summer term begins.  
 September 2, Friday—Second summer term ends.  
 September 22, Thursday—Registration for fall quarter.  
 September 23, Friday—Classes meet.  
 October 1, Saturday—Last day to enter organized classes.  
 November 24, Thursday, to November 27, Sunday—Thanksgiving holidays.  
 December 9, Friday—Fall quarter examinations begin.  
 December 14, Wednesday—Examinations end. Fall quarter ends.

## TABLE OF CONTENTS

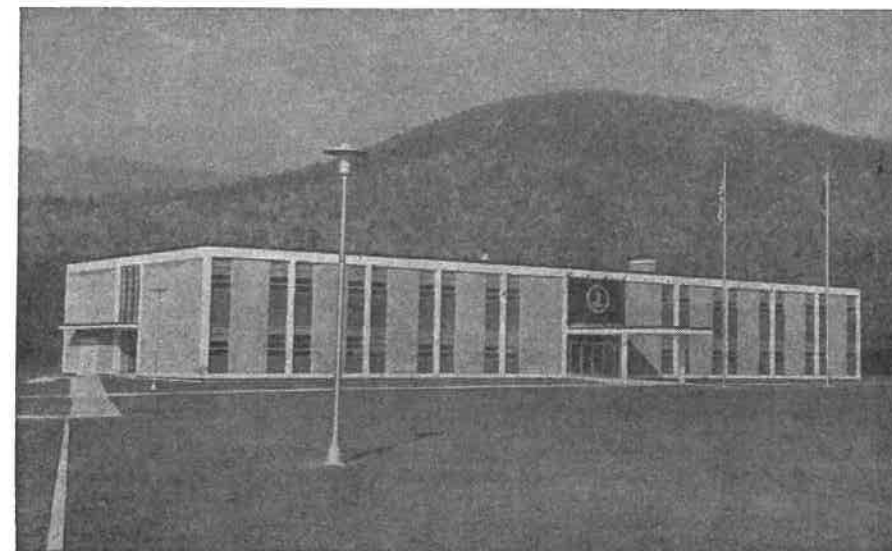
	Page
Where to Write for Information -----	Inside front cover
The Community College Calendar -----	3
Purpose -----	4
General Information -----	5
Faculty and Staff -----	6
Admission of Students -----	7
Administration of Instruction -----	10
Agriculture -----	15
Arts and Sciences -----	18
Business -----	28
Engineering -----	30
Home Economics -----	32
Description of Courses -----	33
General Regulations for Student -----	37
Student Life -----	39
The Honor System -----	41
Financial Information -----	41
Two-Year Terminal Business Certificate Program in Secretarial Science -----	43
Special Courses for Nurses -----	44
Pre-College Foundations -----	45

## PURPOSE

The purpose of the Clifton Forge-Covington Division of Virginia Polytechnic Institute is to provide, within commuting distance, an opportunity for both men and women to study at the university level after graduation from high school. Although geographically separated from the main campus in Blacksburg, the student is able to enjoy both the advantages of living at home and of attending a relatively small college, while he is a student of one of the country's major universities.

The Clifton Forge-Covington Division of Virginia Polytechnic Institute is so coordinated with the parent university that a student can move from one location to the other at the end of any quarter. Although a student applies for admission to the Director of the community college, his permanent records are kept in the Registrar's Office at Blacksburg, and he is not considered as a transfer student when moving to the main campus to continue his education. The community college offers the Freshman and Sophomore years of general college work for practically all four-year university programs.

In addition to general college (transfer) work, the community college offers special programs in secretarial science, pre-college foundations, and general education. Also, special courses are offered for students of the Chesapeake and Ohio Hospital School of Nursing and for employees of area industry. Certificates of Completion are awarded students who successfully complete the prescribed course of study for these special programs.



Clifton Forge-Covington Division Community College Building  
Completed in September, 1964.

## GENERAL INFORMATION

The Clifton Forge-Covington Division of Virginia Polytechnic Institute was officially activated on January 15, 1964, when temporary administrative offices were opened in down-town Clifton Forge, Virginia. The first class of students was admitted for the Fall Quarter, 1964.

## BUILDINGS AND GROUNDS

The community college is located on Route 60, approximately one mile west from the center of Clifton Forge. The principal structure is a new building, containing modern laboratories, classrooms, offices, a library, and a snack bar, located on a 167-acre tract of land.

Present facilities will accommodate approximately 400 full-time students.

## LIBRARY

The library contains an adequate supply of reference material, and is being enlarged each year. The library also receives current periodicals, local and national newspapers.

## RESIDENCE FACILITIES

Immediate plans for the college do not carry any provisions for dormitory or dining hall facilities. A snack room with vending machines is provided for the students. College officials will assist students from out of the area locate housing in private homes in the vicinity of the college.

Faculty and Staff  
VIRGINIA POLYTECHNIC INSTITUTE  
BOARD OF VISITORS

Harry C. Wyatt, *Rector*

William E. Blewett, Jr.	W. T. Rice
George M. Cochran	Mrs. English Showalter
William J. Erwin	Charles W. Wampler, Jr.
Mrs. Mavis M. Gibbs	Mrs. Donald Wilhelm
John W. Hancock, Jr.	Woodrow H. Wilkerson
Adger S. Johnson	E. H. Will
E. H. Lane	Wyatt A. Williams

ADVISORY COMMITTEE  
CLIFTON FORGE-COVINGTON COMMUNITY COLLEGE

T. N. Warren, *Chairman*

W. R. Beazley	Mrs. English Showalter
James Clarkson	B. C. Moomaw, Jr.
G. M. Cochran	E. C. Westerman, Jr.

RESIDENT FACULTY  
CLIFTON FORGE-COVINGTON COMMUNITY COLLEGE

PUYEAR, Donald Empson (1958), *Professor of Engineering and Director*, B. S., Missouri School of Mines and Metallurgy, 1954; M.Sc., Missouri School of Mines and Metallurgy, 1958; Ph.D., V.P.I., 1965.

BLOOM, Edgar B. (1964), *Associate Professor of Chemistry*. A.B., Hiram, 1923; M.S., Ohio State, 1926; Ph.D., Ohio State, 1928.

MARSTON, Wendell Gerald (1965), *Assistant Professor of Business*. B.S., V.P.I., 1949; M.S., V.P.I., 1963.

COFFEY, Arnold Lupton (1964), *Instructor in Engineering*. B.S., V.P.I., 1963. Candidate for M.S. Degree, V.P.I.

HAWTHORNE, Shelby Jean Lucy (1965), *Instructor in Mathematics*. B.S., Longwood College, 1963.

HONAKER, Evelyn Joyce (1965), *Instructor in Business Education*. B.S., Radford College, 1963; Candidate for M.S. Degree, V.P.I.

SCOTT, Elizabeth A. (1964) *Librarian*. B.S., George Peabody College for Teachers, 1935; B.S.L.S., George Peabody College for Teachers, 1936.

TEE, Pin Pin (1964), *Instructor in Mathematics*. B.S., Mapua Institute of Technology; M.S., V.P.I., 1965.

THAYER, Mary Antonia McInnis (1964), *Instructor in English*. B.A., Trinity, 1925; M.A., Boston, 1926; Ph.D., Boston, 1939.

VAUGHAN, George Brandt (1965), *Instructor in History*. B.S., Emory and Henry, 1959; M.S., Radford College, 1965.

WARREN, Nelson Pearson, Jr. (1965), *Instructor in English*. B.A., Bridgewater, 1964; M.A., Appalachian State Teachers College, 1965.

YEOH, Hun Tong (1965), *Instructor in Biology*. B.A., Oklahoma State University, 1961; M.A., Oklahoma State University, 1963. Candidate for Ph.D., V.P.I.

ADMISSION OF STUDENTS

Admission to the Community Colleges of Virginia Polytechnic Institute is based primarily on academic achievement, character, and aptitude for college level education. All courses of resident instruction are open to both men and women.

Special consideration is given to Virginia applicants who show evidence of ability, good character, proper academic preparation, willingness to study and a desire for a college education. A limited number of qualified out-of-state students can be accepted.

Requests for information concerning admissions should be sent to the Director of the Community College in which you are interested.

SCHOLASTIC PREPARATION

For admission, an applicant must have graduated from an accredited high school with a minimum of sixteen units or present at least sixteen units from an accredited private preparatory school.

Of the units required for entrance, the following distribution is considered minimum for entrance to any curriculum:

1. Four units in English
2. Two units in algebra
3. One unit in geometry
4. One unit in history
5. One unit in a laboratory science (biology, chemistry, or physics)

In addition to the above basic requirements in mathematics, an applicant for admission to any curriculum in Engineering (including agricultural engineering), and Architecture, or to the curriculum of biology, chemistry, geology, general science, mathematics, physics, or statistics must offer a fourth unit in college preparatory mathematics. This fourth unit must include one-half unit of trigonometry plus one-half unit of advanced algebra, solid geometry, higher mathematics, or a combination of these. A review course covering high school algebra and trigonometry (mathematics 006) will be offered in the first summer term and in the fall term for students entering engineering, architecture, and the sciences who do not meet the standards for mathematics 106. Under certain conditions Math 006 may be used to fulfill part of the entrance requirements for the Community Colleges.

No foreign languages are required for admission, but it is considered desirable that a portion of the elective units be in a foreign language. This is particularly appropriate if the applicant chooses the Arts and Sciences.

Applicants to Agriculture, Architecture, Engineering, Home Economics, and certain curricula in the Arts and Sciences are encouraged to take more than one laboratory science in high school.

## ENTRANCE TESTS

All freshman applicants are required to take both the Scholastic Aptitude Test (SAT) and the Achievement Tests in English and mathematics of the College Entrance Examination Board. Applicants should have their test scores sent directly to the Director of the Community College in which they are interested. The SAT should be taken on the December testing date of the applicant's senior year in high school. The Achievement Tests in English and mathematics may be taken in December, January, or March according to the applicant's preference.

Information concerning both the Scholastic Aptitude Test and the Achievement Tests may be obtained from the student's high school guidance director or principal or by writing directly to the College Entrance Examination Board, Princeton, New Jersey.

## APPLICATIONS

Studies of the college age population indicate a significant increase in the number of students seeking admission to college. Therefore, freshman applicants for admission for the fall quarter are urged to apply by January 1 of their senior year in high school. Students who apply later may find enrollment quotas filled before their applications can be considered.

Completed application forms must be in the Director's Office at least 60 days prior to the beginning of classes for any quarter before proper notice of acceptance can be expected.

Applications may be obtained by writing or visiting the Community College of your choice.

## APPLYING AS A FRESHMAN

To be considered for admission as a freshman, an applicant must complete and return all application forms to the Director of the Community College of your choice.

1. An official secondary school record including grades on all work through the junior year and a statement from the principal concerning the applicant's qualification for college work. The high school record through the first semester of the senior year may be required for students whose scholastic record and test scores are not completely satisfactory.
  2. Official scores on the Scholastic Aptitude Test of the College Entrance Examination Board.
  3. Certification of honorable discharge if applicant is a veteran.
- All applications are considered promptly by the Admissions Committee upon receipt of the above information. If accepted, the applicant will be sent an official notice of acceptance for admission from Virginia Polytechnic Institute at Blacksburg, Va.

The applicant must accept admission and return the completed forms within 30 days after notification or admission may be denied.

## UNDERGRADUATE TRANSFER STUDENTS

Undergraduate students from other accredited colleges and universities who wish to transfer to a Community College should request application forms from the Director of the College.

Transfer students are required to meet all entrance requirements concerning preparatory subjects and College Entrance Examinations normally required of all entering students. Grades of "D" from another college are not acceptable for transfer credit, and transfer students must offer a previous college average of "C" quality or better.

Applications and an official transcript from each college attended should be received in the Director's Office 60 days prior to the beginning of the quarter for which a transfer student wishes to enroll.

## ADVANCED PLACEMENT

High school graduates of exceptional qualifications will be considered for admission to a Community College with advanced placement in subject matter areas in which they show proficiency as tested by adequate examinations. Examinations for this purpose will be the Advanced Placement examinations administered by the College Entrance Examination Board. These examinations are given in May of each year, and interested students should consult their high school guidance directors. Students admitted under this program may be given advanced placement with credit not to exceed 18 quarter hours. A determination of the credit allowed will be made after the test results are evaluated by the college, and the student will be notified.

As a supplement to the regular advanced placement program, certain students will be permitted to take an advanced placement examination covering algebra and trigonometry. Students given this opportunity must have demonstrated exceptional proficiency in mathematics on the basis of College Board scores and high school records. The Office of Admissions will notify admitted students who are eligible to take this examination of the procedure to be followed in registering for the examination, which is given during the orientation period in September.

## THE SUPERIOR STUDENT

The Community Colleges may admit certain superior students to college even though such students may not have completed the full four years of formal secondary training. To be eligible for admission under this plan, the applicant must be 16 years old, have undoubted superior academic qualifications, and must give evidence of maturity to fit in with the age group of the normal high school graduates. In addition, the applicant must have completed with superior grades at least 12 units of high school preparatory subjects with minimum units as follows: 3 in English; 2 in algebra; 1 in geometry; at least 1 in a laboratory science; and 1 in history. The applicant must also make superior scores on the full battery (morning and afternoon programs) of the College Entrance Examinations administered by the College Entrance Examination Board.

## SPECIAL STUDENTS

VPI makes every effort to provide opportunities for individuals who wish to continue their education by taking special courses offered for college credit or a limited selection of degree-credit courses. Such students may not be candidates for degrees unless they apply formally for regular admission and meet the minimum entrance requirements for a bachelor's or higher degree. If you desire admission under this category, you must give evidence of serious purpose and fitness to pursue with profit the work desired.

## VETERANS

Every consideration is given to qualified applicants entitled to educational benefits authorized by Public Law 550 (Korean), Public Law 894 (Rehabilitation Act), and Public Law 634 (War Orphans). These laws were consolidated under Title 38, U. S. code, effective January 1, 1959.

All applicants who are admitted under the provisions of one of these public laws must furnish the director with a certificate of eligibility and entitlement on the day of registration. This certificate is procured from the Regional Office, Veterans Administration. Veterans are urged to apply for educational benefits several weeks before they expect to enter college.

---

## ADMINISTRATION OF INSTRUCTION

---

### GENERAL ORGANIZATION

The instruction for undergraduate curricula for the first two years at a Community College is organized into six quarters. In addition to the required technical work, every curriculum contains a number of general or cultural courses. As far as possible, the work of the freshman year in each curriculum in a given school is similar. This plan offers an opportunity to the student to change his curriculum by the end of the freshman year with a minimum loss of credit.

The undergraduate curricula or courses of study offered at Virginia Polytechnic Institute are listed below. The basic first two years of these courses are offered at the Community Colleges.

#### COLLEGE OF AGRICULTURE

Bachelor of Science, Agricultural Science, Technical Agriculture, Agricultural Business or Forest Management. The student is admitted to the School of Agriculture, and then at the time of registration he chooses one of four fields:

Agricultural Science, with a major in one of the following: agricultural economics, agricultural education, agronomy, animal science, dairy science (dairy technology, dairy production), horticulture (fruits and vegetables, ornamental horticulture, food technology), or poultry science.

Technical Agriculture, with a major in one of the following: agricultural economics, agricultural education, agronomy, animal science, dairy science (dairy technology, dairy production), horticulture (fruits and vegetables, ornamental horticulture), poultry science, or rural sociology.

Agricultural Business, with a major in one of the following: agricultural economics, agricultural education, agronomy, animal science, dairy science (dairy technology, dairy production), horticulture (fruits and vegetables, ornamental horticulture, food technology), poultry science, or rural sociology.

Forest Management, with a major in one of the following: general forestry, forest wildlife, forest wildlife management, watershed management, or forest recreation.

#### COLLEGE OF ARCHITECTURE

Bachelor of Architecture (5 years), Bachelor of Science in Architectural Engineering, Building Construction.

#### COLLEGE OF ARTS AND SCIENCES

Bachelor of Science: majors in biology (includes pre-medical courses), chemistry (includes pre-pharmacy courses), distributive education, economics, English, general science, geology, geophysics, history, industrial arts education, mathematics, political science, physics, statistics, vocational industrial education.

#### COLLEGE OF BUSINESS

Bachelor of Science in Business, with majors in accounting, business administration, business education, economics, and public administration. (A student planning to enter a law school later should enroll in the School of Business.)

#### COLLEGE OF ENGINEERING

Bachelor of Science in	Chemical Engineering
Aerospace Engineering	Civil Engineering
Agricultural Engineering	Electrical Engineering
Ceramic Engineering	Engineering Mechanics
	Industrial Engineering
	Mechanical Engineering
	Metallurgical Engineering
	Mining Engineering

#### COLLEGE OF HOME ECONOMICS

Bachelor of Science, majors in clothing, textiles, and related art; human nutrition and foods; home management and family housing; family development; and general home economics.

### SELECTION OF STUDIES

All students are expected to select one of the above regular programs of study. Irregular programs are undesirable. While in general a student will be expected to carry the full schedule of credit hours in his chosen curriculum, on the advice of his adviser or of the Admissions Office in the case of freshmen, a schedule below the normal may be required.

Students will be assisted through faculty guidance, introductory courses, and every other way possible, to choose wisely the curriculum to be taken. The students' advisers should be consulted in the selection of courses and the arrangement of various matters connected therewith. It is probable that all courses announced under the various departments of instruction will be given, but the right is reserved to withdraw any course for which the number of applicants is less than eight.

## AUDITING

Students, with permission of their course advisers and the instructors offering the classes, may be enrolled in classes, other than laboratory classes, as auditors. Their only privilege is that of listening and they may not later take an examination for credit. An auditor may not transfer to regular status in a class after three weeks of the quarter have elapsed.

Part-time students pay the fee for auditing stated in the financial section.

## THE PREPARATION OF TEACHERS

The Community Colleges offer a comprehensive program of teacher education for students who want to teach in secondary and post-secondary and elementary schools. Preparation programs are provided in all of the vocational education areas listed under Teacher Education in the department of vocational education. In addition, students majoring in any subject may commit themselves to a teacher education program which will qualify them to receive the Collegiate Professional Certificate. A limited number of elective courses in psychology and education are available for students who are not committed to a teacher education program but who want to learn more about the general problems of education and psychology. Students pursuing teacher education programs are eligible for State teacher scholarships.

## CREDITS

The unit of credit used is the quarter or credit hour. This is defined as the requirement of three hours of the student's time each week for one quarter of approximately twelve weeks. These three hours may all be spent in the laboratory with no outside preparation required or one hour may be spent in class with two hours of preparation required. The totals of quarter credits in the curricular schedules show the number of credits or quarter hours required; if these be multiplied by three, the number of working hours required of the student each week may be determined. To convert credit or quarter hours into semester hours, multiply by two-thirds; into session hours, multiply by one-third.

## GRADES AND GRADE POINTS

The work of the student will be rated as follows:

- A — Excellent—100 to 91
- B — Good—90 to 81
- C — Fair—80 to 71
- D — Barely passing—70 to 61
- F — Failure—60 and below
- I — Incomplete
- G — Deferred passing
- H — Deferred failing
- RP — Resigned passing
- RF — Resigned failing

Incomplete may be given only in the case of laboratory or practical work where, for reason satisfactory to the instructor, the requirements of the course have not been completed. Grades of A, B, C, D, and F are final and may not be changed except by repeating the subject.

In connection with the grading system, a system of quality credits is used. This operates as follows: 4 quality credits are allowed for each hour of work of A grade; 3 for each of B grade; 2 for each of C grade and 1 for each of D grade. No quality credits are allowed for a failing grade.

At the close of each quarter a report of the student's work will be sent to his parent or guardian, or to the student, according to the approved policy.

## CLASSIFICATION

The class standing of a student is determined at the beginning of each college session and will not be changed during that session, regardless of the length of residence in this or any other college.

To be classified as a sophomore, a student must have received credit for at least 42 hours of required work in his curriculum; as a junior, at least 90 such hours.

## EXAMINATIONS

Entrance examinations are held during the week preceding the fall quarter. Regular quarter examinations are held at the close of each quarter. Advanced standing examinations, when authorized, are taken at a specially designated time.

Final examinations are given according to a schedule set up for the entire college. Only in unusual circumstances is a student given permission to take a final examination at a time other than the scheduled time. Deferred examinations must be held before the close of the next following quarter the student is in college. A student failing for any reason to take a deferred examination on the day appointed forfeits this privilege. The responsibility for arranging for deferred examinations rests upon the student, and the college assumes no obligation. Professors will, however, give information and render such assistance as is possible upon request from the student. Advanced standing examinations, early examinations, and deferred examinations, if authorized, carry a fee of \$2 for each such examination.

## VIRGINIA STUDENTS' PRIVILEGE

Virginia students are not required to pay the tuition fee of \$110 a quarter charged out-of-state students. A law passed by the General Assembly of 1936 defines a Virginia student as one who "has been a bona-fide citizen or resident of Virginia for a period of at least one year immediately prior to admission to said institution."



## ACADEMIC PENALTIES

### Requirements of Undergraduates to Continue as Students

Continuance in a program of study at V.P.I. is a privilege which is granted as long as a student is benefiting from such attendance. The privilege may be withdrawn by a Dean at any time to protect the University's standards of scholarship and personal conduct.

Students who do not make reasonable scholastic progress in their course of study will be designated by the Dean of their College "Academically Deficient," "On Probation" or "Dropped for Academic Reasons." Notice of this fact will be provided by a notation on the student's grade report.

In all cases of "Academic Deficiency" or "On Probation," it is strongly recommended that the student consult immediately with his course advisor and the Director of the Community College.

A student who has been dropped for academic reasons must apply to the Dean of his College for readmission. If he is changing curriculum to a different college, permission of both Deans will be required.

A student may appeal to the Academic Council a decision regarding being dropped for academic reasons. His request should be made through the Vice President.

### Administrative Guiding Principles

Full-time students, those taking 12 quarter hours or more, who fail to pass 12 quarter hours and earn 24 quality credits (9 quarter hours and 18 quality credits during a freshman's first three quarters) will be designated academically deficient. Part-time students who do not obtain a C average in a given quarter will be considered academically deficient. Colleges may require higher standards of performance at their discretion. A second consecutive quarter of academically deficient work will usually place a student on probation, but at the discretion of the Dean he may be continued on academic deficiency. A student who has been on "Academic Deficiency" for two or more quarters may be dropped at the discretion of the Dean for continued deficient performance. *An academically deficient record while on probation will result in an automatic drop from the university.*

A student who has compiled an academic record of an unusually low grade index may be put directly on probation or dropped, at the discretion of the Dean.

The time required before applying for readmission following an academic drop varies with the colleges. A student who has been dropped for academic reasons will generally be readmitted on probation. If a student is dropped twice for academic reasons, he will generally not be readmitted for further study.

## CURRICULAR SCHEDULES

The distribution of courses of instruction in the various curricula is shown in the schedules on the following pages. The courses listed are described in detail under Departments of Instruction. The figures

in the columns indicating the quarters in which the courses are given are of two kinds: first, the figure denoting the number of hours a week the class meets during the quarter; and, second, in parentheses, the number of credits allowed for the course during the quarter.

## AGRICULTURE

Agriculture embraces the production of food and fiber products, including the business of farming, supply and service agencies, and the assembling, processing, and marketing industries. The School of Agriculture offers educational programs leading to careers in each of these broad fields. These programs provide education in line with the changes which have taken place and now are occurring. Education in the sciences is emphasized, because agriculture and its allied industries depend upon the application of scientific knowledge and principles. The Resident Instruction program administers the courses of instruction in agriculture.

The following departments are grouped in this school: agricultural economics and rural sociology, agricultural engineering, agronomy, animal husbandry, biochemistry and nutrition, biology, dairy science, entomology, forestry and wildlife, home economics, horticulture, poultry husbandry, plant pathology and physiology, statistics, veterinary science, and vocational education.

### CURRICULA IN AGRICULTURE

The industry of agriculture is characterized by its rapid adoption of scientific and technical advances. It is marked by great increases in mechanization, efficiency, and size of the farm business and its related industries and business firms. Knowledge of fundamentals, properly augmented with the practical, enables the student to start his career and equips him for further development.

A successful career in the industry of agriculture requires a body of knowledge common to all areas. The curricular organization provides for education of students with different interests, seeking first to provide the essential fundamentals, and later allowing for a satisfactory degree of specialization. Curricular requirements beyond the freshman year establish the minimum educational achievement necessary for all graduates.

Four curricula are offered: Agricultural science, technical agriculture, agricultural business, and forest management.

AGRICULTURAL SCIENCE emphasizes the basic sciences and mathematics and their relationships to agriculture. Courses from the humanities, and the physical, biological, and social sciences are included to insure a broad educational program. This curriculum is designed

for students who plan to continue as graduate students in one of the many specialized phases of agriculture or whose anticipated careers require a strong scientific foundation.

Students in this curriculum should have better than average scholastic ability. They may select a major in one of the following: agricultural economics, agricultural education, agronomy, animal husbandry, dairy science (dairy technology, dairy production), horticulture (fruits and vegetables, ornamental horticulture, food technology), and poultry.

TECHNICAL AGRICULTURE prepares students for careers in applied phases of agriculture, including agricultural production and work with farm people. The curriculum includes courses in the basic sciences and humanities to provide a broad education. Courses which deal with the application of scientific principles to agricultural practices are included. Graduates are prepared to apply the technology developed through research.

Students in this curriculum may select a major in one of the following: agricultural economics, agricultural education, agronomy, animal science, dairy science (dairy technology, dairy production), horticulture (fruits and vegetables, ornamental horticulture), poultry science, and rural sociology.

AGRICULTURAL BUSINESS prepares students for careers with agricultural industries and off-farm agricultural agencies in positions requiring a basic knowledge of agriculture and business. Courses in this curriculum provide education in the basic physical and biological sciences, the technical phases of agriculture, and in the fundamental principles of economics and business.

Students in this curriculum may select a major in one of the following: agricultural economics, agricultural education, agronomy, animal science, dairy science (dairy technology, dairy production), horticulture (fruits and vegetables, ornamental horticulture, food technology), poultry science, and rural sociology.

FOREST MANAGEMENT prepares students for careers with lumber, pulpwood, and other wood-using industries, and with state and federal agencies in positions related to forest management, forest wildlife management, and forest recreation. This curriculum provides a broad background in the basic sciences related to forestry.

Students in this curriculum may select a major in one of the following at the beginning of their junior year: general forestry, forest wildlife management, watershed management, and forest recreation.

## THE FIRST YEAR IN AGRICULTURE

A core of basic subjects is required for all students. After the first year course of study, a student chooses his major department and curriculum.

FIRST YEAR COURSES	I	II	III
Chem. 113-123-133—General Chemistry.....	3(3)	3(3)	3(3)
Chem. 114-124-134—General Chemistry Laboratory.....	3(1)	3(1)	3(1)
Eng. 111-121-131—English Composition.....	3(3)	3(3)	3(3)
Math. 111-121-131—Introductory Mathematical Analysis*....	5(5)	5(5)	5(5)
Zool. 113—General Zoology, or Bot. 111—General Botany, Bot. 121—General Botany, Zool. 133 (**)—General Zoology	8(4)	8(4)	8(4)
Total for first year.....	(16)	(16)	(16)

\*All entering freshmen with an inadequate foundation in mathematics indicated by test scores and high school records will take Math 006—Algebra and Trigonometry 5(0).

\*\*Students may take Bot. 111-121-131—General Botany or Zool. 113-123-133—General Zoology in the first year, but the omitted course (Bot 121—General Botany or Zool. 133—General Zoology) must be taken in the second or subsequent year.

Courses for the second year may be selected from the following list.

COURSE AND TITLE	Curricula			
	Agricultural Science	Technical Agriculture	Agricultural Business	Forest Management
	Course credits in quarter hours			
Chemistry 216—Analytical Chemistry.....	8			
Biology.....	12	8	8	12
Courses selected in Zoology or Botany or related fields				
Physics				
Phys. 212-222-232—Physics.....	6	6	6	9
Phys. 213-223-233—Physics Laboratory.....				3
Mathematics				
Math. 216-226-236—Calculus and Differential Equations.....	6			6
English and Foreign Languages				
At least 6 credits must come from				
Eng. 212-222-232—Survey of English Literature..	12	12	12	12
History and Government.....	6	6	6	3
Hist. 114-124-134—Western Civilization				
Hist. 223-233—Development of Civilization				
P. Sci. 214-224-234—American Government				
Economics				
Econ. 211-221-231—Principles of Economics.....	6	6	6	6
Philosophy, Psychology, Sociology.....	6	6	6	3
Psych. 201—General Psychology				
Ru. So. 211-221—General Sociology				

## ARCHITECTURE

Four programs of studies in the arts and science of building are offered: architecture, architectural engineering, building construction, and city and regional planning. Through all four programs runs a thread of common purpose, to train students to qualify for leadership in shaping human environment, to bring order and vitality and form to man's surroundings.

The first year of the courses in Architecture and Architectural Engineering can be offered in the Community Colleges with the exception of about 20 hours of specialized work. Electives can be substituted for these hours. Students in either of these programs should transfer to the college of their choice after the first year.

FIRST YEAR	I	II	III
Electives.....	(4)	(4)	(4)
<sup>1</sup> Eng. 131—Composition and Literature.....	3(3)		
Eng. 211-221—Survey of English Literature.....		3(3)	3(3)
Hist. 114-124-134—Western Civilization.....	2(2)	2(2)	2(2)
<sup>2</sup> Math. 111-121-131—Introductory Mathematical Analysis....	5(5)	5(5)	5(5)
Gen. Engr. 101—Introduction to Engineering.....	3(1)		
I. E. 111-121—Engineering Drawing.....	6(2)	6(2)	
I. E. 103—Descriptive Geometry.....			6(3)
Credits each quarter.....	(17)	(16)	(17)

<sup>1</sup> Entering freshmen with an inadequate foundation in grammar and composition indicated by test scores and high school records will be required to take English 111-121, Grammar and Composition. College credit will be given for these courses but this credit is not applicable toward an engineering degree. A student who earns a grade of "A" or "B" on English 111 will be excused from English 121.

<sup>2</sup> All entering freshmen with an inadequate foundation in mathematics indicated by test scores and high school records will take Math 006—Algebra and Trigonometry 5(0).

## ARTS AND SCIENCES

Arts and Science courses are offered in the following departments: biology, chemistry, English and foreign languages, history and political science, mathematics, military science, philosophy and religion, physical education, physics, statistics, and professional education.

Pre-professional curricula include: (1) Preparation for dentistry, medicine, and veterinary medicine included in the curriculum in biology; (2) preparation for pharmacy included in the curriculum in chemistry.

### CURRICULAR REQUIREMENTS FOR ALL STUDENTS

- I. Science (biology, chemistry, geology, or physics) ..... 12 hours
- II. English (grammar and composition and literature) ..... 18 hours
- III. Foreign Language (through the second year; students with two years of the language in high school need take only nine hours)..... 18 hours

Students in vocational education curricula replace the foreign language with professional education courses.

IV. Mathematics and/or Statistics ..... 11 hours

V. Social Studies (history: nine hours; nine additional hours to be selected from the following subjects: economics, political science, philosophy, psychology, religion, sociology, fine arts—NOT applied arts)—18 hours

The following majors are approved: (1) biology (a. botany, b. zoology); (2) chemistry; (3) economics (cooperative arrangement with the School of Business); (4) English; (5) general science; (6) geology; (7) geophysics; (8) history; (9) mathematics; (10) physics; (11) political science; (12) statistics (mathematics courses acceptable toward major); (13) vocational education (a. distributive education, b. industrial arts education, c. vocational industrial education).

## BIOLOGY

The programs in biology are designed primarily to provide fundamental training for work in botany, bacteriology, genetics, zoology, and similar technical fields, as well as in the medical professions.

Two curricula are offered, one in botany and one in zoology. For those interested in entomology, genetics or microbiology, suitable substitutions in the curricula may be made to pursue these interests.

A combination B.S. degree will be granted to students satisfactorily completing the first three years of the curriculum in biology and the first year of work in an accredited school of medicine, dentistry, or veterinary medicine, provided that two years, including the third year, are spent in residence at V.P.I.

**PREPARATION FOR MEDICINE.**—The training afforded by the first three years of the zoology curriculum meets the pre-medical training requirements of those medical colleges which accept students with only three years of undergraduate work. It is strongly recommended, however, that all students complete the requirements for the B. S. degree before entering medical college.

**PREPARATION FOR DENTISTRY.**—The dental colleges all require a minimum of two years college training for admission, but it is generally advisable for the student to spend a longer period in preparation. Students who expect to enter dental colleges with two years training should take organic chemistry in the sophomore year.

**PREPARATION FOR VETERINARY MEDICINE.**—The veterinary schools all require a minimum of two years of college training for admission. Few students who are able to meet only the minimum entrance requirements are accepted by the veterinary schools. Those students expecting to be admitted with two years of college training should take organic chemistry in the sophomore year.

### BIOLOGY (Botany and Zoology Options)

FIRST YEAR	I	II	III
Zool. 113-123-133—General Zoology (Zoology Option).....	8(4)	8(4)	8(4)
or			
Bot. 111-121-131—General Botany (Botany Option).....	8(4)	8(4)	8(4)
Chem. 113-123-133—General Chemistry.....	3(3)	3(3)	3(3)
Chem. 114-124-134—General Chemistry Laboratory.....	3(1)	3(1)	3(1)
Eng. 111-121-131—English Composition.....	3(3)	3(3)	3(3)
Math. 111-121-131—Introductory Mathematical Analysis*....	5(5)	5(5)	5(5)
Elective.....		(3)	(3)
Credits each quarter.....	(16)	(17)	(17)

\*All entering freshmen with an inadequate foundation in mathematics indicated by test scores and high school records will take Math 006—Algebra and Trigonometry 5(0).

SECOND YEAR	I	II	III
Bot. 121-131—General Botany (Zoology Option).....		8(4)	8(4)
or			
Zool. 123-133—General Zoology (Botany Option).....		8(4)	8(4)
Phys. 211-221-231—General Physics.....	3(3)	3(3)	3(3)
Phys. 213-223-233—Physics Laboratory.....	3(1)	3(1)	3(1)
Eng. 212-222-232—English Literature.....	3(3)	3(3)	3(3)
F. L. 112-122-132—First German.....	3(3)	3(3)	3(3)
Elective.....	(6)		(3)
Credits each quarter.....	(18)	(16)	(17)

### CHEMISTRY

The chemistry curriculum provides the student with the theoretical and practical instruction and training in chemistry and allied fields.

The program of undergraduate study in chemistry is designed primarily to provide broad theoretical and practical instruction in the basic, fundamental concepts of chemistry rather than to train a student in a particular narrow area for employment in a particular industry.

FIRST YEAR	I	II	III
Chem. 113-123-133—General Chemistry.....	3(3)	3(3)	3(3)
Chem. 114-124-134—General Chemistry Laboratory.....	3(1)	3(1)	3(1)
Eng. 111-121-131—English Composition.....	3(3)	3(3)	3(3)
Math. 111-121-131—Introductory Mathematical Analysis*....	5(5)	5(5)	5(5)
Electives.....	3(3)	3(3)	3(3)
Electives.....	(1)	(1)	(1)
Credits each quarter.....	(16)	(16)	(16)

\*All entering freshmen with an inadequate foundation in mathematics indicated by test scores and high school records will take Math 006—Algebra and Trigonometry 5(0).

SECOND YEAR	I	II	III
Chem. 216-226-236—Analytical Chemistry.....	5(3)	5(3)	5(3)
Eng. 212-222-232—English Literature.....	3(3)	3(3)	3(3)
Phys. 212-222-232—Physics.....	3(3)	3(3)	3(3)
Phys. 213-223-233—Physics Laboratory.....	3(1)	3(1)	3(1)
Math. 216-226-206—Calculus and Differential Equations.....	4(4)	4(4)	4(4)
Elective.....	(2)	3(3)	3(3)
Credits each quarter.....	(16)	(17)	(17)

### ENGLISH

The English curriculum should appeal to students who desire to prepare for careers in which the art of writing is involved, such as editorial work, advertising, journalism, and the many facets of public relations; to those who wish to enter the teaching profession; to those who wish to prepare for graduate or professional schools. It should also appeal to those who feel that their preparation for life, in whatever profession they choose, must include an appreciation of the world's great literature. Those who expect to pursue a course in English should complete the core curriculum with electives in the field.

### GENERAL SCIENCE

The purpose of this curriculum is to provide broader training in the basic sciences than is possible in more restricted technical curricula. Consequently, students are given excellent preparation, particularly in the biological and agricultural sciences, leading to employment as researchers, teachers, or industrial technologists. Liberal electives are included allowing each student and the course adviser to select advanced technical courses in those fields where his particular objectives require additional training. In addition, adequate courses are offered in such fields as agriculture, education, literature, political science, and psychology. Minimum requirements include the following: one year of course work in each of five basic sciences (biology, chemistry, geology, physics, and mathematics), 45 credit hours in one of these sciences, 27 credit hours in an approved minor.

In addition to the general and core requirements of the School of Arts and Sciences, the following specific requirements must be met.

### COURSES

Chem. 113-123-133, General Chemistry; Math 111-121-131—Introductory Mathematical Analyses; Zool. 113-133, General Zoology; Bot. 121, General Botany; Math. 216-226, Differential Equations; Phys. 212-222-232, Physics; Phys. 213-223-233, Physics Laboratory.

## HISTORY

The history curriculum is intended for those students whose primary academic interest is in history as a humanity or social science. The curriculum provides a broad background for careers in business and government as well as preparation for the liberal professions.

Those who expect to pursue a course in history should complete the core curriculum with electives in the field.

## MATHEMATICS

The curriculum in mathematics is designed for those students who desire a broad fundamental background in mathematics.

FIRST YEAR	I	II	III
Chem. 113-123-133—General Chemistry.....	3(3)	3(3)	3(3)
Chem. 114-124-134—General Chemistry Laboratory.....	3(1)	3(1)	3(1)
or Zool. 113-133—General Zoology.....	8(4)		8(4)
and Bot. 121—General Botany.....		8(4)	
Eng. 111-121-131—English Composition.....	3(3)	3(3)	3(3)
Hist. 213-223-233—Development of Civilization.....	3(3)	3(3)	3(3)
<sup>1</sup> Math. 111-121-131—Introductory Mathematical Analysis.....	5(5)	5(5)	5(5)
Electives.....	(3)	(3)	(3)
Credits each quarter.....	(18)	(18)	(18)

<sup>1</sup> Entering freshmen with an inadequate background in algebra and trigonometry indicated by test scores and high school records will be required to take Math 006 for which no credit is given.

SECOND YEAR	I	II	III
<sup>2</sup> F. L. 111-121-131—First French.....	3(3)	3(3)	3(3)
Eng. 212-222-232—English Literature.....	3(3)	3(3)	3(3)
Math. 216-226-236—Calculus and Differential Equations.....	4(4)	4(4)	4(4)
Phys. 212-222-232—Physics.....	3(3)	3(3)	3(3)
Phys. 213-223-233—Physics Laboratory.....	3(1)	3(1)	3(1)
Electives.....	(3)	(3)	(3)
Credits each quarter.....	(17)	(17)	(17)

<sup>2</sup> German may be substituted.

## PRE-PHARMACY

**PREPARATION FOR PHARMACY.**—Students preparing to study pharmacy should complete as a minimum the first year's work in chemistry. The completion of the second year in this curriculum before entering a school of pharmacy is strongly advised.

The course work for a more complete year of work designed specifically for Pre-Pharmacy students is outlined below.

PRE-PHARMACY	I	II	III
Zool. 113, 133—General Zoology and.....	8(4)		8(4)
Bot. 121—General Botany.....		8(4)	
or Chem. 113-123-133—General Chemistry.....	3(3)	3(3)	3(3)
Chem. 114-124-134—General Chemistry Laboratory.....	3(1)	3(1)	3(1)
Eng. 111-121-131—English Composition.....	3(3)	3(3)	3(3)
Psych. 201—General Psychology.....	3(3)		
Ru. So. 211—General Sociology.....		3(3)	
P. Sci. 214-224-234—American Government.....	3(3)	3(3)	3(3)
<sup>1</sup> Math. 111-121—Introductory Mathematical Analysis.....	5(5)	5(5)	
Hist. 233—Development of Civilization.....			3(3)
Econ. 211-221-231—Principles of Economics.....	3(3)	3(3)	3(3)
Credits each quarter.....	(21)	(21)	(16)

<sup>1</sup> All entering freshmen with an inadequate foundation in mathematics indicated by test scores and high school records will take Math 006—Algebra and Trigonometry 5(0).

## PHYSICS

The curriculum in physics is arranged to give a broad foundation in the fundamental sciences, as well as specialized training in both classical physics and modern physics.

FIRST YEAR	I	II	III
Chem. 113-123-133—General Chemistry.....	3(3)	3(3)	3(3)
Chem. 114-124-134—General Chemistry Laboratory.....	3(1)	3(1)	3(1)
Eng. 111-121-131—English Composition.....	3(3)	3(3)	3(3)
<sup>1</sup> Math. 111-121-131—Introductory Mathematical Analysis.....	5(5)	5(5)	5(5)
F. L. 111-121-131—First French } or F. L. 112-122-132—First German }	3(3)	3(3)	3(3)
Electives.....	(3)	(3)	(3)
Credits each quarter.....	(18)	(18)	(18)

<sup>1</sup> All entering freshmen with an inadequate foundation in mathematics indicated by test scores and high school records will take Math 006—Algebra and Trigonometry 5(0).

SECOND YEAR	I	II	III
Math. 216-226-236—Calculus and Differential Equations.....	4(4)	4(4)	4(4)
F. L. 211-221-231—Second French } or F. L. 212-222-232—Second German }	3(3)	3(3)	3(3)
Phys. 212-222-232—Physics.....	3(3)	3(3)	3(3)
Phys. 213-223-233—Physics Laboratory.....	3(1)	3(1)	3(1)
Phys. 319—Modern Physics.....			3(3)
Eng. 212—Survey of English Literature.....	3(3)		
Elective (Literature).....		(3)	(3)
Elective (Free).....	(3)	(3)	
Credits each quarter.....	(17)	(17)	(17)

## POLITICAL SCIENCE

The political science curriculum is intended for students whose primary interest is in political science as an academic discipline. The curriculum provides a broad background for careers in government and business as well as preparation for the liberal professions. Interested students should complete the core curriculum with electives in the field.

## STATISTICS

The undergraduate curriculum provides the necessary preparation for students intending to enter this field.

FIRST YEAR	I	II	III
Chem. 113-123-133—General Chemistry.....	3(3)	3(3)	3(3)
and Chem. 114-124-134—General Chemistry Laboratory.....	3(1)	3(1)	3(1)
or Zool. 113-133—General Zoology.....	8(4)		8(4)
and Bot. 121—General Botany.....		8(4)	
History.....	3(3)	3(3)	3(3)
Eng. 111-121-131—English Composition.....	3(3)	3(3)	3(3)
<sup>1</sup> Math. 111-121-131—Introductory Mathematical Analysis.....	5(5)	5(5)	5(5)
Electives.....	(3)	(3)	(3)
Credits each quarter.....	(18)	(18)	(18)

<sup>1</sup> All entering freshmen with an inadequate foundation in mathematics indicated by test scores and high school records will take Math 006—Algebra and Trigonometry 5(0).

SECOND YEAR	I	II	III
Eng. 212-222—English Literature.....	3(3)	3(3)	
Foreign Language—First Year.....	3(3)	3(3)	3(3)
Math. 216-226-236—Calculus and Differential Equations.....	4(4)	4(4)	4(4)
Phys. 212-222-232—Physics.....	3(3)	3(3)	3(3)
Phys. 213-223-233—Physics Laboratory.....	3(1)	3(1)	3(1)
Stat. 201—Introductory Statistics.....			3(3)
Electives.....	(3)	(3)	(3)
Credits each quarter.....	(17)	(17)	(17)

## TEACHER EDUCATION PROGRAMS

Teacher preparation programs are available in a variety of fields. The purpose of these programs is to prepare students for teaching high school and post high school subjects. Course requirements for the various programs are shown below:

### Agricultural Education

FIRST YEAR	I	II	III
Bot. 121—General Botany.....		8(4)	
Chem. 113-123-133—General Chemistry.....	3(3)	3(3)	3(3)
Chem. 114-124-134—General Chemistry Laboratory.....	3(1)	3(1)	3(1)
Eng. 111-121-131—English Composition.....	3(3)	3(3)	3(3)
Math. 114-124-134—Algebra and Trigonometry <sup>1</sup> .....	3(3)	3(3)	3(3)
Zool. 113-133—General Zoology <sup>2</sup> .....	8(4)		8(4)
Electives.....	(3)	(3)	(3)
Credits each quarter.....	(17)	(17)	(17)

<sup>1</sup> Students may elect Math 111-121-131 instead of Math 114-124-134 and omit electives.

<sup>2</sup> Bot 111 may be substituted for Zool 113.

SECOND YEAR	I	II	III
Econ. 211-221—Principles of Economics.....	3(3)	3(3)	
Eng. 212, 222, or 232—Survey of English Literature <i>or</i> .....	3(3)	3(3)	
Eng. 214-224—American Literature <sup>1</sup> .....			3(3)
Eng. 305—Public Speaking.....			
Hist. 112-122—Contemporary America <i>or</i> .....	3(3)	3(3)	
Hist. 111-121 or 131—History of the United States.....	3(3)	3(3)	
Phys. 211 and 221 or 231—General Physics.....			3(3)
Ru. So. 211—General Sociology.....	(6)	(6)	(9)
Electives <sup>2</sup> .....			
Credits each quarter.....	(18)	(18)	(18)

<sup>1</sup> Two quarters of English or American Literature are required.

<sup>2</sup> Engineering Drawing may be elected. This curriculum is offered in cooperation with the Agricultural program.

### Business Education

FIRST YEAR	I	II	III
Econ. 211-221-231—Principles of Economics.....	3(3)	3(3)	3(3)
Engl. 111-121-131—English Composition.....	3(3)	3(3)	3(3)
Hist. 213-223-233—Development of Civilization.....	3(3)	3(3)	3(3)
Math. 114-124-134—Algebra and Trigonometry.....	3(3)	3(3)	3(3)
Natural Science.....	6(4)	6(4)	6(4)
Credits each quarter.....	(16)	(16)	(16)

SECOND YEAR	I	II	III
Acct. 211-221-231—Principles of Accounting.....	6(4)	6(4)	6(4)
Engl. 212-222-214—English and American Literature.....	3(3)	3(3)	3(3)
Engl. 305—Public Speaking.....	3(3)		
Hist. 319-329—American Economic History.....		3(3)	3(3)
P. Sci. 214-224-234—American Government.....	3(3)	3(3)	3(3)
Elective.....	(3)	(3)	(3)
Credits each quarter.....	(16)	(16)	(16)

This curriculum is offered in cooperation with the Business program.

#### Distributive Education

FIRST YEAR	I	II	III
Art <sup>1</sup> .....	3(3)		
Art <sup>1</sup> .....		3(3)	
Hist. 111-121-131—History of the United States.....	3(3)	3(3)	3(3)
Science (Botany, Zoology, Geology, Chemistry, Physics).....	(4)	(4)	(4)
Eng. 111-121-131—English Composition.....	3(3)	3(3)	3(3)
Math. 114-124-134—Algebra and Trigonometry.....	3(3)	3(3)	3(3)
Elective.....	(2)	(2)	(3)
Credits each quarter.....	(18)	(18)	(16)

<sup>1</sup>May substitute courses in foreign language, or graphics, for this requirement.

SECOND YEAR	I	II	III
Econ. 211-221-231—Principles of Economics.....	3(3)	3(3)	3(3)
Eng. 211-221-231—English and American Literature.....	3(3)	3(3)	3(3)
Eng. 305—Public Speaking.....			3(3)
Psych. 201-202—General Psychology.....	3(3)	3(3)	
Psych. 204—Educational Psychology.....			3(3)
Free Electives.....	(9)	(9)	(6)
Credits each quarter.....	(18)	(18)	(18)

#### Industrial Arts Education

FIRST YEAR	I	II	III
Eng. 111-121-131—English Composition.....	3(3)	3(3)	3(3)
I. E. 111-121—Engineering Drawing.....	6(2)	6(2)	
I. E. 103—Descriptive Geometry.....			3(3)
<sup>1</sup> Math. 111-121-131—Introductory Mathematical Analysis.....	5(5)	5(5)	5(5)
Psych. 203—Educational Psychology.....			3(3)
Hist. 131—History of the United States.....	3(3)		
Hist. 112-122—Contemporary America.....		3(3)	3(3)
Chem. 113-123-133—General Chemistry.....	3(3)	3(3)	3(3)
Chem. 114-124-134—General Chemistry Laboratory.....	3(1)	3(1)	3(1)
Credits each quarter.....	(17)	(17)	(16)

<sup>1</sup>All entering freshmen with an inadequate foundation in mathematics indicated by test scores and high school records will take Math 006—Algebra and Trigonometry 5(0).

SECOND YEAR	I	II	III
Eng. 212—Survey of English Literature.....	3(3)		
Eng. 214-224—American Literature.....		3(3)	3(3)
Phys. 213-223-233—Physics.....	3(3)	3(3)	3(3)
Phys. 213-223-233—Physics Laboratory.....	3(1)	3(1)	3(1)
P. Sci. 214-224-234—American Government.....	3(3)	3(3)	3(3)
Ru. So. 211—General Sociology.....	3(3)		
Eng. 305—Public Speaking.....		3(3)	
Elective.....	(3)	(3)	(6)
Credits each quarter.....	(16)	(16)	(16)

#### Vocational Industrial Education

FIRST YEAR	I	II	III
Chem. 113-123-133—General Chemistry.....	3(3)	3(3)	3(3)
Chem. 114-124-134—General Chemistry Laboratory.....	3(1)	3(1)	3(1)
Eng. 111-121-131—English Composition.....	3(3)	3(3)	3(3)
I. E. 111-121—Engineering Drawing.....	6(2)	6(2)	
I. E. 103—Descriptive Geometry.....			6(3)
Hist. 131—History of the United States.....	3(3)		
Hist. 112-122—Contemporary America.....		3(3)	3(3)
<sup>1</sup> Math. 111-121-131—Introductory Mathematical Analysis.....	5(5)	5(5)	5(5)
Electives.....			(3)
Credits each quarter.....	(17)	(17)	(16)

<sup>1</sup>All entering freshmen with an inadequate foundation in mathematics indicated by test scores and high school records will take Math 006—Algebra and Trigonometry 5(0).

SECOND YEAR	I	II	III
Econ. 302—Principles of Economics.....			5(5)
Eng. 212—Survey of English Literature.....	3(3)		
Eng. 214-224—American Literature.....		3(3)	3(3)
Phys. 212-222-232—Physics.....	3(3)	3(3)	3(3)
Phys. 213-223-233—Physics Laboratory.....	3(1)	3(1)	3(1)
Psych. 204—Educational Psychology.....	3(3)		
P. Sci. 224—American Government.....			3(3)
Ru. So. 211—General Sociology.....		3(3)	
Electives—Mathematics.....	(3)	(3)	
Electives.....	(3)	(3)	(3)
Credits each quarter.....	(16)	(16)	(18)

**TEACHER EDUCATION PROGRAMS  
IN THE LIBERAL ARTS AND LIFE SCIENCES**

Students pursuing teacher preparation programs in Biology, Chemistry, English, General Science, History, Mathematics and Physics will take the courses listed in the catalogue for each of the subject matter areas indicated. The courses for the first two years of the teacher education program in the above areas are identical. A general Teacher Education Program for the first two years is outlined below.

**General Teacher Education**

FIRST YEAR	I	II	III
Eng. 111-121-131—English Composition.....	3(3)	3(3)	3(3)
Hist. 111-121-131—History of the United States.....	3(3)	3(3)	3(3)
Psych. 201-202—General Psychology.....	3(3)	3(3)	
Psych. 204—Educational Psychology.....			3(3)
Math. 114-124-134—Algebra and Trigonometry.....	3(3)	3(3)	3(3)
F. L. 112-122-132—First German } or F. L. 111-121-131—First French }	3(3)	3(3)	3(3)
Credits each quarter.....	(15)	(15)	(15)

SECOND YEAR	I	II	III
Eng. 212-222-232—Survey of English Literature.....	3(3)	3(3)	3(3)
Psych. 205—Psychology of Personality.....	3(3)		
Hist. 213-223-233—Development of Civilization.....	3(3)	3(3)	3(3)
Ed. 302—Foundation of Education.....			3(3)
F. L. 212-222-232—Second German } or F. L. 211-221-231—Second French }	3(3)	3(3)	3(3)
P. Sc. 214-224-234—American Government.....	3(3)	3(3)	3(3)
Zool. 113-123-133—General Zoology } or Bot. 111-121-131—General Botany } or Chem. 113-123-133—General Chemistry }	6(4)	6(4)	6(4)
Credits each quarter.....	(19)	(16)	(19)

**BUSINESS**

The Business curricula combines a general education approach with broad programs in business. The primary objective is to prepare men and women for successful service in the broad field of business. It is not intended to prepare for clerical and similar occupations but rather to lay a broad foundation with thorough training in the fundamentals of sound business theory and practices. In this learning process, students should gain a deep appreciation of the values and

obligations of useful citizenship. The curricula are so designed that a student can choose a number of courses in one of the areas of business in which he may have a particular interest.

**Curriculum for the First Two Years**

A beginning student may select a major from one of the following areas: accounting, business administration, business education, economics, and public administration. However, it is not necessary that a major be selected until the beginning of the junior year, since all students in business take the same courses for the first two years. The curriculum for the freshman and sophomore years is shown below:

FIRST YEAR	I	II	III
Econ. 211-221-231—Principles of Economics.....	3(3)	3(3)	3(3)
Engl. 111-121-131—English Composition.....	3(3)	3(3)	3(3)
Hist. 213-223-233—Development of Civilization.....	3(3)	3(3)	3(3)
Math. 114-124-134—Algebra and Trigonometry.....	3(3)	3(3)	3(3)
Natural Science.....	6(4)	6(4)	6(4)
Credits each quarter.....	(16)	(16)	(16)

SECOND YEAR	I	II	III
Acct. 211-221-231—Principles of Accounting.....	6(4)	6(4)	6(4)
Engl. 212-222-214—English and American Literature.....	3(3)	3(3)	3(3)
Engl. 305—Public Speaking.....	3(3)		
Hist. 319-329—American Economic History.....		3(3)	3(3)
P. Sci. 214-224-234—American Government.....	3(3)	3(3)	3(3)
Elective.....	(3)	(3)	(3)
Credits each quarter.....	(16)	(16)	(16)

**PREPARATION FOR LAW**

There is no pre-law course in the School of Business in the sense of a set of requirements specified by the law schools. These schools require at least two years of college work and many require three years. The four-year course leading to the bachelor of science degree in business provides a sound preparation for law schools.

The bachelor of science degree in business can be granted to students satisfactorily completing the first three years in the School of Business with a major in either business administration or public administration and the first year of law at an accredited School of Law. Those students desiring to follow this plan should work closely with their course advisor.



## ENGINEERING

### First Year of Engineering Curricula

In order to permit all engineering students to find out what special field of Engineering they desire to pursue, the first three quarters of all curricula in the School of Engineering are uniform.

FIRST YEAR	I	II	III
Chem. 113-123-133—General Chemistry.....	3(3)	3(3)	3(3)
Chem. 114-124-134—General Chemistry Laboratory.....	3(1)	3(1)	3(1)
<sup>1</sup> Eng. 131—Composition and Literature.....	3(3)		
Eng. 212-214—Literature.....		3(3)	3(3)
Hist. 114-124-134—Western Civilization.....	2(2)	2(2)	2(2)
<sup>2</sup> Math. 111-121-131—Introductory Mathematical Analysis.....	5(5)	5(5)	5(5)
Gen. Engr. 101—Introduction to Engineering.....	3(1)		
I. E. 111-121—Engineering Drawing.....	6(2)	6(2)	
I. E. 103—Descriptive Geometry.....			6(3)
Elective.....			3(3)
Credits each quarter.....	(17)	(16)	(20)

<sup>1</sup> Entering freshmen with an inadequate foundation in grammar and composition indicated by test scores and high school records will be required to take English 111-121, Grammar and Composition. College credit will be given for these courses but this credit is not applicable toward an engineering degree. A student who earns a grade of "A" or "B" on English 111 will be excused from English 121.

<sup>2</sup> All entering freshmen with an inadequate foundation in mathematics indicated by test scores and high school records will take Math 006—Algebra and Trigonometry 5(0).

ENGINEERING—SECOND YEAR	I	II	III
E. M. 203-204—Mechanics (Statics-Dynamics).....	4(4)	5(5)	
E. M. 205—Mechanics of Materials I.....			4(4)
Math. 216-226-236—Calculus and Differential Equations.....	4(4)	4(4)	4(4)
Phys. 212-222-232—Physics.....	3(3)	3(3)	3(3)
Phys. 213-223-233—Physics Laboratory.....	3(1)	3(1)	3(1)
Econ. 302—Principles of Economics 5(5).....	See "E" below		
Electives—Humanity.....	See "H" below		
Technical Option.....	See courses below		
<b>ELECTIVES AND OPTIONS</b>			
Aerospace Engineering.....	H-3(3)	E-5(5)	
E. E. 3010—Electrical Theory.....			5(5)
Agricultural Engineering.....		H-3(3)	E-5(5)
I. E. 3011—Manufacturing Processes.....			4(2)
Ceramic Engineering.....	H-3(3)		E-5(5)
Electives—Approved Technical Courses.....	3(3)	3(3)	
Chemical Engineering.....		E-5(5)	H-3(3)
Chem. 216—Analytical Chemistry.....	5(3)		
Ch. E. 201—Chemical Engineering Calculations.....			3(3)
Civil Engineering.....		H-3(3)	E-5(5)
C. E. 202—Surveying.....	9(5)		
Electrical Engineering.....	H-3(3)	E-5(5)	
E. E. 201—Circuits I.....			5(5)
Engineering Mechanics.....	H-3(3)	E-5(5)	H-3(3)
I. E. 3011—Manufacturing Processes.....			4(2)
Industrial Engineering.....	H-4(4)	H-4(4)	E-5(5)
Mechanical Engineering.....	E-5(5)	H-3(3)	
E. E. 3010—Electrical Theory.....			5(5)
Marine Option—Delete H-3(3) and add M. E. 204.....		3(3)	
Metallurgical Engineering.....		H-3(3)	E-5(5)
Chem. 216—Analytical Chemistry.....	5(3)		
I. E. 3011—Manufacturing Processes.....			4(2)
Mining Engineering.....		H-3(3)	E-5(5)
Chem. 216—Analytical Chemistry.....	5(3)		
C. E. 201—Surveying.....	4(2)		

## HOME ECONOMICS

Home Economics provides both general and professional education. It serves four functions: educating for personal development, citizenship, family living, and a professional career. Home Economics is organized into four departments: (1) clothing, textiles and related art; (2) human nutrition and foods; (3) management, housing and family development; and (4) general home economics.

### The Undergraduate Program in Home Economics

A common core of subjects in general education, as well as home economics, is required of all majors. Not only are the courses of study planned for those whose main interest is to study for family living but for students who wish professional specialization for: teaching preschool children; extension work as home demonstration agents; careers as hospital dietitians or in food service administration; careers in areas of business related to home economics; home economics journalism; and research and graduate work in various areas of home economics. The curriculum for the first two years is the same for all home economics students. It provides a liberal education background and an excellent foundation for the various areas of home economics concentration.

### Courses for the First Two Years

FIRST YEAR	I	II	III
Eng. 111-121-131—English Composition.....	3(3)	3(3)	3(3)
Chem. 113-123-133—General Chemistry.....	3(3)	3(3)	3(3)
Chem. 114-124-134—General Chemistry Laboratory.....	3(1)	3(1)	3(1)
Math. 114-124-134—Algebra and Trigonometry.....	3(3)	3(3)	3(3)
Zool. 113-123-133—General Zoology.....	6(4)	6(4)	6(4)
Hist. 114-124—Western Civilization.....	3(3)	3(3)	
Hist. 223—Development of Civilization.....			3(3)
Credits each quarter.....	(17)	(17)	(17)

SECOND YEAR	I	II	III
Eng. 212-222-232—English and American Literature.....	3(3)	3(3)	3(3)
Phys. 212-222-232—Physics.....	3(3)	3(3)	3(3)
Econ. 211-221-231—Principles of Economics.....	3(3)	3(3)	3(3)
Eng. 305—Public Speaking.....	3(3)		
Psych. 201—General Psychology.....			3(3)
P. Sci. 214—American Government.....			3(3)
Ru. So. 211—General Sociology.....		3(3)	
Electives in English or Foreign Language.....	(3)	(3)	
Credits each quarter.....	(15)	(15)	(15)

## NURSING PROGRAM

The course work in Nursing is offered to supplement the courses given at the training hospitals. This material has been developed with the cooperation of the Chesapeake and Ohio Hospital School of Nursing. Courses carry either V.P.I. or community college credit, as noted. Further work in this field is not offered at V.P.I.

NURSING	I	II	III
Zool. 114-124-134—Human Anatomy and Physiology.....	6(4)	6(4)	6(4) 5(3*)
Bact. N1—Microbiology.....			6(4*)
Chem. N1-N2—Chemistry for Nurses.....		6(4*)	6(4*)
Engl. 111-121-131—English Composition.....	3(3)	3(3)	3(3)
Math. N1—Mathematics for Nurses.....	5(5*)		
Psych. 201-202—General Psychology.....	3(3)	3(3)	
Ru. So. 211—General Sociology.....		3(3)	
Credits each quarter.....	(15)	(17)	(14)

\*Community college credits, not for transfer to V.P.I.

## DESCRIPTION OF COURSES

### ACCOUNTING

**Acct. 211-221-231. PRINCIPLES OF ACCOUNTING.**—The fundamental elements of accounting. Prerequisite: Acct. 111-121, and Math. 114-124. Lectures, 3 hours; laboratory, 3 hours; 4 credits each quarter.

### BIOLOGY

#### Botany

**Bot. 111-121-131. GENERAL BOTANY.**—First quarter: General principles of biology, structure of the cell, cellular physiology, heredity and evolution. Second quarter: Structure, function, and classification of seed plants. Third quarter: Survey of the plant kingdom. Prerequisite to second quarter: Bot. 111 or Zool. 113. Lectures, 2 hours; laboratory, 6 hours; 4 credits each quarter.

#### Zoology

**Zool. 113-123-133. GENERAL ZOOLOGY.**—First quarter: Introduction to cellular biology, reproduction, heredity and principles of evolution. Second quarter: Systematic review of the invertebrate phyla, with emphasis on morphology, life cycles, ecology and economics. Third quarter: Systematic review of the vertebrates with emphasis on morphology, physiology, behavior and evolution. Prerequisite to third quarter: Zool. 113 or Bot. 111. Lectures, 2 hours; laboratory, 6 hours; 4 credits each quarter.

**Zool. 114-124-134. HUMAN ANATOMY AND PHYSIOLOGY.**—Structure and functioning of the normal human body, as a basis for understanding nursing theory and practice. Not acceptable for minimum B. S. credit in biology. Lectures, 3 hours; laboratory, 3 hours; 4 credits each quarter.

**Zool 201. INTRODUCTORY GENETICS.**—To acquaint students previously introduced to Mendelian inheritance with the broad field of genetics: Particulate inheritance, chromosomal theory, genetic variation, sex determination, extra-nu-

clear inheritance, nature and action of genetic material, and genetic basis of evolution. Prerequisite: Bot. 111 or Zool. 113. Lectures, 4 hours; 4 credits.

#### CHEMISTRY

Chem. 113-123-133. GENERAL CHEMISTRY.—Principles of the science, the character of the elements and their more important compounds, the solution of chemical problems and important applications. Lectures, 3 hours; 3 credits each quarter.

Chem. 114-124-134. GENERAL CHEMISTRY LABORATORY.—Accompanies course 113-123-133 and, where laboratory work is required in the student's curriculum, must be taken concurrently in phase with the lecture sequence. Selected experiments illustrate the principles taught in lecture, and the third quarter is devoted to qualitative analysis. Laboratory, 3 hours; 1 credit each quarter.

Chem. 216-226-236. ANALYTICAL CHEMISTRY.—Includes theory of electrolytic solutions, solution equilibria and the application of theoretical principles to both qualitative and quantitative analytical procedures. Prerequisite: Chem. 113-123-133. Lectures, 2 hours; laboratory, 3 hours; 3 credits each quarter.

#### CIVIL ENGINEERING

C. E. 201. INTRODUCTORY SURVEYING.—Basic surveying for non-civil engineering students; use of surveying instruments; topographic and construction surveys. Prerequisite: Math. 102 or 106 and Graph. 121. Lectures, 1 hour; field work, 3 hours; 2 credits.

C. E. 202. SURVEYING.—Engineering measurements and errors; theory and use of instruments; topographic, construction and route surveys; applications of measurements in civil engineering. Prerequisite: Math. 106 and I.E. 121. Lectures, 3 hours; field work, 6 hours; 5 credits.

C. E. 203. CURVES AND EARTHWORK.—Principles of route surveying; simple, compound and transition curves; grades and vertical curves; earthwork and haul quantities. Prerequisite: Math. 116 and C.E. 202. Lectures, 2 hours; computation, 3 hours; 3 credits.

#### ECONOMICS

Econ. 211-221-231. PRINCIPLES OF ECONOMICS.—Intended to lay the foundations for study along more specialized lines. Lectures, 3 hours; 3 credits each quarter.

Econ. 302. PRINCIPLES OF ECONOMICS.—Principles of economics condensed primarily for students in engineering. Lectures, 5 hours; 5 credits.

#### ELECTRICAL ENGINEERING

E. E. 201. CIRCUITS I.—The fundamental laws of circuit theory, the elements of network topology, mesh currents and node voltages, and the methods used for solving one-terminal-pair and two-terminal-pair problems. Prerequisite: Phys. 222, must be accompanied or preceded by Math. 236. Lectures, 5 hours; 5 credits.

E. E. 3010. ELECTRICAL THEORY.—For students in curricula other than electrical engineering. A study of the fundamentals of electric circuits and electron tubes. Prerequisite: Math. 226, Phys. 222 and 223. Lectures, 5 hours; 5 credits.

#### ENGINEERING MECHANICS

E. M. 203. MECHANICS I.—Statics.—Vector treatment using index notation of concepts of force, mass, space and time, gravitational systems of measurements, forces, moments and vector quantities; the analysis of discrete and distributed force systems and their application to bodies in external equilibrium including cranes, trusses, etc.; principles of dry friction; centroids and fluid statics. Prerequisite: Math. 126, corequisite Math. 216. Lectures, 4 hours; 4 credits.

E. M. 204. MECHANICS II.—Dynamics.—Vector treatment using index notation of coplanar and three dimensional kinematics and kinetics of particles and rigid bodies, including relative motion, mass moments of inertia, Newton's laws, work and energy, impulse and momentum, vibration, and balancing. Prerequisite: E.M. 203, Math. 216, corequisite Math. 226. Lectures, 5 hours; 5 credits.

E. M. 205. MECHANICS OF MATERIALS I.—Introductory mechanics of continuous media; concepts of stress, strain, stress-strain relations; plane moments of inertia; stress and deformation due to longitudinal loads, torsion and bending; plane stress; Euler column theory. Prerequisite: E.M. 203, Math. 226, corequisite Math. 206. Lectures, 4 hours, 4 credits.

#### ENGLISH

Eng. 111-121-131. ENGLISH COMPOSITION.—The first quarter concentrates upon basic grammar; the second and third quarters offer advanced composition and rhetoric with the final quarter also including a brief study of the nature of poetry. Themes and parallel reading are essential. English Composition 111 is a prerequisite for 121, and English Composition 111 and 121 are prerequisites for 131. Lectures, 3 hours; 3 credits each quarter.

Eng. 212-222-232. SURVEY OF ENGLISH LITERATURE.—In the first quarter this course covers Old English lyrics and *Beowulf* through Bacon; in the second quarter seventeenth-century lyrics through Hazlitt; and in the third quarter from Byron into the modern period. Parallel reading and original critical essays are required. Prerequisite: completion of required freshman English. Lectures, 3 hours; 3 credits each quarter.

Eng. 214-224. AMERICAN LITERATURE.—The first quarter covers American literature from the beginnings to approximately 1870, including the writings of Mark Twain; the second quarter deals with American writers from 1870 to the present. Parallel reading and original critical essays are required. Prerequisite: completion of required freshman English. Lectures, 3 hours; 3 credits each quarter.

Eng. 305. PUBLIC SPEAKING.—Included are selection of subject, preparation of speech, mode of delivery, action and gesture, enunciation and pronunciation, force of conviction, and weight of message. Numerous classroom speeches are required. Prerequisite: completion of required freshman English. Lectures, 3 hours; 3 credits.

#### FOREIGN LANGUAGES

F. L. 111-121-131. FIRST FRENCH.—Stress is put upon fundamentals of grammar. The work in translation consists of carefully selected material for beginners in French. Lectures, 3 hours; 3 credits each quarter.

F. L. 112-122-132. FIRST GERMAN.—Similar to the first-year course in French. Lectures, 3 hours; 3 credits each quarter.

F. L. 211-221-231. SECOND FRENCH.—In the first and second quarters emphasis is placed upon techniques of translation. The first quarter is devoted to the reading of works by French scientists; the second quarter to the reading of selected works from French literature; the third quarter to an intensive review of grammar and composition. Prerequisite: F.L. 111-121-131. Lectures, 3 hours; 3 credits each quarter.

F. L. 212-222-232. SECOND GERMAN.—Similar to the second-year course in French, emphasis being laid on scientific works. Prerequisite: F.L. 112-122-132. Lectures, 3 hours; 3 credits each quarter.

#### GENERAL ENGINEERING

G. E. 101. INTRODUCTION TO ENGINEERING.—Professional fields in engineering; the work of the engineer; requirements in training and character; professional ethics; the divisions of industrial practice. In the computation period simple problems from the various fields of engineering are used with slide rule applications. Lectures, 3 hours; 1 credit.

## HISTORY AND POLITICAL SCIENCE

### History

Hist. 111-121-131. HISTORY OF THE UNITED STATES.—Survey of the United States history. Lectures, 3 hours; 3 credits each quarter.

Hist. 112-122. CONTEMPORARY AMERICA.—The first quarter will cover the origins of World War II, the war and the post war world to the Korean War. The second quarter will be devoted to the years since 1952 with special emphasis on the role of the United States in world affairs. Lectures, 3 hours; 3 credits each quarter.

Hist. 114-124-134. WESTERN CIVILIZATION.—Primarily for engineering students. Beginning with the Reformation, attention will be given to the evolution of western civilization with emphasis upon the technological and economic forces. Lectures, 2 hours; 2 credits each quarter.

Hist. 213-223-233. DEVELOPMENT OF CIVILIZATION.—Evolution of civilization from ancient times to the present, for students in all departments desiring a general knowledge of the development of our political, social and cultural heritage. Lectures, 3 hours; 3 credits each quarter.

Hist. 319-329. AMERICAN ECONOMIC HISTORY.—The first quarter will analyze European and American economic history in the 18th and 19th centuries. The second quarter will be devoted to 20th century America. Corequisite: Principles of Economics. Lectures, 3 hours; 3 credits each quarter.

### Political Science

P. Sci. 214-224-234. AMERICAN GOVERNMENT.—Historical development of American political institutions. Lectures, 3 hours; 3 credits each quarter.

## INDUSTRIAL ENGINEERING

I. E. 103. DESCRIPTIVE GEOMETRY.—A study of the analysis and representation of the space relationship of the elementary geometric magnitudes: point, line, plane, single-curved surface, and double-curved surface of revolution. Prerequisite: I.E. 121. Lectures, 2 hours; laboratory, 4 hours; 3 credits.

I. E. 111-121. ENGINEERING DRAWING.—Embraces (1) theory of the several kinds of projection used as the basis for the construction of engineering drawings, and (2) an introduction to the idioms and practices used in making working drawings. 111: freehand lettering, freehand sketching, and mechanically drawn orthographic projections. 121: isometric drawing, oblique projection, chart and graph construction, threaded fastener representation, engineering working drawings, and demonstration of the common methods of drawing duplication. Prerequisite: For I. E. 121, I. E. 111. Laboratory, 6 hours; 2 credits each quarter.

### MATHEMATICS

Math. 111-121-131. INTRODUCTORY MATHEMATICAL ANALYSIS.—To give students in engineering and the sciences a modern course in mathematics to properly prepare them for their upper division courses in their major field.

Math. 114-124-134. ALGEBRA AND TRIGONOMETRY.—A general course in algebra and trigonometry for students other than those in engineering and science. Prerequisite: Two units of high school algebra and one of plane geometry. Lectures, 3 hours; 3 credits per quarter.

Math. 214-224-234. ANALYTICAL GEOMETRY AND CALCULUS.—For students in other curricula than engineering and science. Prerequisite: Math. 134 or Math. 106. Lectures, 3 hours; 3 credits per quarter.

Math. 216-226-236. CALCULUS AND DIFFERENTIAL EQUATIONS.—For students in engineering and science curricula. Differential and integral calculus, multiple integration and partial differentiation, applications. A first course in differential equations. Series solutions and applications. Prerequisite: Math 126 or equivalent. Lectures, 4 hours; 4 credits.

## PHYSICS

Phys. 212-222-232. PHYSICS.—General college physics for students of engineering and the mathematical sciences. Corequisite: Math. 116-126. Phys. 212 is prerequisite for Phys. 222 and 232. Lectures, 3 hours; 3 credits each quarter.

Phys. 213-223-233. PHYSICS LABORATORY.—Affords student opportunity to acquaint himself with the phenomena of physics, and to cultivate the ability to take accurate observations and to make a neat, systematic report of results. Corequisite: Phys. 212-222-232. Laboratory, 3 hours; 1 credit each quarter.

## PSYCHOLOGY AND EDUCATION

### Education

Ed. 302. FOUNDATIONS OF EDUCATION.—The aims, organization, and procedures of public school education with the objective of giving students a common integrating background of information and understanding relative to the total program of public school education. This course or its equivalent is a prerequisite for all advanced courses in education. Lectures, 3 hours; 3 credits.

### Psychology

Psych. 201. GENERAL PSYCHOLOGY.—Introduction to psychology. Lectures, 3 hours; 3 credits.

Psych. 202. GENERAL PSYCHOLOGY.—Continuation of Psych. 201 at a more advanced level, with emphasis on emotional adjustment, the individual and the group, psychology and industry, and psychology and social issues. Should be preceded by Psych. 201. Lectures, 3 hours; 3 credits.

Psych. 203. EDUCATIONAL PSYCHOLOGY.—Principles of child behavior and growth as they are related to the school system. Problems of health, interests and incentives, emotional stress and discipline, and emotional adjustment. Should not be substituted for Psych. 204. Lectures, 3 hours; 3 credits.

Psych. 204. EDUCATIONAL PSYCHOLOGY.—Principles of learning and growth as they apply to the teaching process at all levels but with emphasis placed on principles of greatest importance at the secondary school level. Lectures, 3 hours; 3 credits.

Psych. 205. PSYCHOLOGY OF PERSONALITY.—Introduction to the psychology of self understanding and the attainment of personal efficiency. Lectures, 3 hours; 3 credits.

### RURAL SOCIOLOGY

Ru. So. 211-221. GENERAL SOCIOLOGY.—Pertains to various forms of human association, their structure, processes and products in terms of culture systems, human nature and personality. For various students in the college. Lectures, 3 hours; 3 credits each quarter.

### STATISTICS

Stat. 201. INTRODUCTORY STATISTICS.—An introduction to the fundamental ideas of statistics including a brief treatment of descriptive statistics, problems of sampling, estimation, the testing of hypotheses regression, and correlation. Prerequisite: Math. 116. Lectures, 3 hours; 3 credits.

## GENERAL REGULATIONS FOR STUDENT

A student is admitted to the college on the promise that he possesses a sincere desire to gain a higher education and a willingness to accept the standards of conduct and achievement set by the college.

The regulations governing the actions of students include those given or referred to below or elsewhere in this catalog and those applicable to special groups which will be distributed to students upon arrival. Students are responsible for a thorough knowledge of them and conformity with them.

**PERSONAL CONDUCT**—As a state educational institution, the college is under obligation to use all the resources at its command to insure the observance of the laws of the Commonwealth by the members of its student body. In addition to preparing men to fill useful positions in their chosen fields, it has the added objective of training them for citizenship of the highest type. Accordingly, students are expected to conduct themselves in a manner consistent with the recognized standards of good taste and propriety which this demands.

Among the many requisites of good conduct, attention is called to the following specific stipulation:

1. Disorderly conduct, under any circumstances, is unbecoming a student of R.T.I. and will not be tolerated.
2. All students are expected to adhere strictly to the laws of the Commonwealth and the community including those concerned with the purchase and use of alcoholic beverages.
3. The use or possession of alcoholic beverages (including ale, beer and wine) is prohibited on the campus or in the college buildings.

**CLASS ATTENDANCE**—Prompt and regular attendance at all classes is expected. Students must not assume that they are automatically entitled to a specific number of unexcused absences. Occasional absence within reasonable limits may be allowed, however, subject to the following limitations:

1. Absence of any nature does not relieve the student from responsibility for the entire subject matter of the course or for assignments made in classes which he may have missed.
2. Absences from classes will be excused provided a leave of absence has been obtained from the Director.
3. Absences from classes will be excused by the Director on the day the student returns. Student must bring a written excuse.
4. A previously announced test or a laboratory experiment may be made up, or assigned work turned in late without penalty, only if the absence is excused by a leave of absence from the Director or by the instructor. Work missed by reason of excused absences must be made up with reasonable promptness at a time set by the instructor.
5. Each instructor may formulate supplementary rules, not inconsistent herewith, for the guidance of students in attaining the standards of accomplishment desired by the instructor.
6. A student whose absences from class for any reason are such as to endanger his standing shall be cautioned by his instructor and, in case of further unexcused absences, shall be reported to the office. The Director may impose such penalties as he deems appropriate

and notify the student's parents of the action taken, or he may recommend summary suspension or dismissal.

**NOTE:** For a student in his first year of college work, unexcused absences in a course in excess of two shall be considered as endangering his standing.

**MOTOR VEHICLES**—Students may not operate or have in their possession at the college any motor vehicle which is not registered at the office. Vehicles so registered must be operated in accordance with the traffic regulations currently in force.

#### MISCELLANEOUS REGULATIONS

1. Students must respond promptly to a request to report to any college official.
2. Students are expected to check the bulletin board for announcement and mail daily.
3. A student who desires to withdraw from college must submit his resignation in writing on the prescribed form before leaving the campus.
4. Students living off the campus are expected to conform to the same general regulations as those living on the campus.

---

## STUDENT LIFE

---

### BASIC POLICY

The college accepts responsibility for: (1) providing the atmosphere and training that will permit the greatest degree of development of the individual student in his chosen professional field, (2) encouraging and promoting in every reasonable manner the leadership potential of the student so that he may assume his maximum degree of responsibility in any community in which he finds himself, (3) inculcating, fostering, and nurturing in the student the highest type of democratic ideals, and (4) providing the atmosphere and training that will permit in the student the greatest degree of development of those traits of moral character that are the generally accepted standards for successful living.

Every student who is privileged to matriculate at the Virginia Polytechnic Institute is obligated at all times to assume a sense of responsibility for his action, to respect constituted authority, to conform to the ordinary rules of good conduct, to be truthful, to respect the rights of others, to protect private and public property, and to make the most effective use of his time in securing his education.

Every individual has rights which are to be respected. They include the right of respect for personal feelings, the right of freedom

from indignity of any type, the right of freedom from control by any person except as prescribed in the published policies of the college, and the right to make the best use of his time and talents toward the educational objective that brought him to this institution. No one, staff member or student, shall violate these rights. No custom or regulation in conflict with these rights will be allowed to prevail.

It shall be the duty of every person employed by this institution to conform to this policy; to cooperate with all agencies of the college and with the student body, individually and collectively, in carrying out its provisions. The individual faculty and staff member is personally responsible for enforcement of the Basic Policy.

**INTERPRETATION OF BASIC POLICY.**—The Basic Policy may be implemented and realized in practice *only* if full cognizance is given to the responsibilities inherent in both the students and in the college. In any democratic community rights of individuals and organizations are predicated upon and inseparable from attendant responsibilities. Failure of an individual or organization to carry out these inherent responsibilities invalidates those attendant rights, which, incidentally, are not privileges.

All students are expected to observe the Basic Policy. The student who at all times conforms to ordinary rules of propriety and gentlemanly conduct, is truthful, respects the rights of others, is punctual and regular in attendance upon required exercises, and has due regard for preservation of public and private property, need have no difficulty in conforming to it.

The college recognizes the privileges, rights, and responsibilities of students to engage in extra-curricular life and believes that constructive experience as a member of the student body supplements and complements the academic development in producing a more broadly educated man.

The perpetuation of these responsibilities, as well as the laws of the Commonwealth of Virginia that authorize and support the Community College, require that the college be the final authority in connection with all phases of student life, and that such authority be exercised through properly constituted staff and student officers.

The right of each student to individual freedom and personal privacy and action, except as provided by the conduct code or the college regulations, is recognized and must be observed by students and college authorities alike.

Specifically, any act or activity which interferes with the students' rights as defined in the Basic Policy shall be considered a serious offense and reported through appropriate channels for disciplinary action.

## THE HONOR SYSTEM

The honor system is a long established tradition of V.P.I. In brief, the aim of this system is to cherish and develop the manly virtue, honor. At the request of the students, the university assumes that every student will demonstrate the highest degree of integrity in all his actions at the college. Furthermore, each student considers it his responsibility to report to his student government officers any failure of another student to live up to the principles of the Honor Code. Following an investigation by the officers of the honor court, the offender is tried before a student jury. After the trial and before the result is announced, the record of the trial and the sentence imposed are carefully reviewed by a committee of the faculty.

## FINANCIAL INFORMATION

**TUITION**—The following charges are payable by all students at the beginning of each quarter:

	<i>Fall Quarter</i>	<i>Winter Quarter</i>	<i>Spring Quarter</i>
College Fee (all students) -----	\$110.00	\$110.00	\$110.00

For students whose homes are not in Virginia an additional charge of \$110.00 a quarter is made.

**LATE REGISTRATION**—Any student who fails to complete registration on the first day of any quarter will have to wait the convenience of the person handling the class tickets and conform to the office hours which can be arranged without disturbing the routine of duties. The college cannot justify the inconvenience for the registration of students who return late. Any absence from class on account of late registration will be counted as an unexcused absence.

**Important Notice**—Tuition to the college must be made by money order or by check in the exact amount due payable to the "Treasurer of V.P.I."

## INFORMATION AS TO EXPENSES

All fees and other college charges are due at the beginning of each quarter. No reduction or exemption in rates is made for students. No allowance is made in college fees or tuition for late entrance.

In view of the increasing costs of operations and the rapidly changing conditions, the college reserves the right to increase the college fees, tuition or other charges at any time during the college year, if it be found necessary to protect the college against loss.

**REFUNDS**—Refunds will be made to students under the following rules:

1. If a student withdraws from college fifteen days before the end of the quarter, the college fees and tuition will be refunded on a pro rata basis less the amount of the registration fee which is \$10.00.

## OTHER EXPENSES

The amounts stated in the foregoing sections cover the charges which the college collects from students. It is impossible for a college to do more than state the actual amounts which the college officially requires students to pay. There are, of course, other expenses of college attendance which vary with the tastes of the individual student and his ability to pay.

Students must furnish their own books and supplies other than those provided them in the laboratories and shops. As a rule the cost is less after the first quarter, since the more expensive items are serviceable through several quarters. New students taking engineering drawing for the first time are advised not to purchase any part of their drawing outfit until they have attended the first meeting of the class when advice as to this will be given.

## FINANCIAL AID TO STUDENTS

*Scholarships.* A limited number of scholarships are available each year to qualified students. These scholarships are awarded on the basis of academic achievement, character, need, potential for successful college work, promise of future usefulness, and any other qualifications required for specific scholarships.

An application for a scholarship cannot be considered until the student has submitted his final application forms for admission, has taken the entrance tests administered by the College Entrance Examination Board, and has been accepted for admission. Only one application form is necessary even though the student wishes to apply for more than one scholarship. Scholarships for students other than freshmen are awarded at the end of each academic year.

A list of scholarships and information concerning each scholarship may be obtained from the Director of each Community College.

*Awards.* A number of awards are made each year to students meeting the specific qualifications and requirements for these awards. Applications are not accepted for "awards."

*Loans.* Loan funds from various sources are available to students to assist them in the payment of college expenses. To be eligible for a loan, a student must show definite need and have a satisfactory academic record; he must also meet any requirements set up for a specific loan fund. Three percent interest is charged on all loans except those having special provisions.

The bulletin, *Financial Aid to Students*, includes a list of all loans available to students at the present time. Applications for loans should be made to the Treasurer of V.P.I. through the Director of each Community College.

## TWO-YEAR TERMINAL BUSINESS CERTIFICATE PROGRAM IN SECRETARIAL SCIENCE

**GENERAL INFORMATION**—Clifton Forge-Covington Division of V. P. I. offers a two-year terminal program in Secretarial Science. A certificate will be awarded upon the successful completion of the two-year program described herein.

**PROCEDURE FOR ADMISSION**—Applicants for admission should apply by letter or in person at the Admissions Office, Clifton Forge-Covington Division of V. P. I., Clifton Forge, Va. Application forms will then be sent to the applicant. These forms must be completed in their entirety and returned to the Director of the Community College, and if found satisfactory the applicant will be sent the proper admission notice.

**ENTRANCE REQUIREMENTS**—The requirements for entrance to the Certificate Program in Business include graduation from an accredited high school with at least sixteen units. There are no specific mathematics requirements; however, the Scholastic Aptitude Test given by the College Entrance Examination Board is required. Since these requirements are insufficient for entrance to any of the four-year programs offered at V. P. I. leading to the Bachelor of Science degree, no units obtained from the college in the Certificate Program will be acceptable as transfer credit toward the four-year curricula.

**REQUIREMENTS FOR GRADUATION**—A certificate of completion will be awarded to all candidates who have completed the total program as described herein with a 2.00 quality point average (C average).

### PROGRAM OF STUDY

#### Two-Year Terminal Certificate Business Program in Secretarial Science

Fall (I), Winter (II), and Spring (III) Quarters

FIRST YEAR COURSES	I	II	III
Acct. 11-12-13—Introduction to Business.....	2(2)	2(2)	2(2)
Engl. 11-12-13—Commercial English.....	3(3)	3(3)	3(3)
B. Ed. 11-12-13—Elementary Typewriting.....	6(4)	6(4)	6(4)
B. Ed. 14-15-16—Elementary Shorthand.....	6(4)	6(4)	6(4)
Math. 11-12-13—Business Arithmetic.....	3(3)	3(3)	3(3)
<b>TOTAL FOR FIRST YEAR.....</b>	<b>(16)</b>	<b>(16)</b>	<b>(16)</b>
SECOND YEAR COURSES	I	II	III
Acct. 21-22-23—Secretarial Accounting.....	6(4)	6(4)	6(4)
Econ. 21-22—Introduction to Economics.....	3(3)	3(3)	.....
B. Ed. 27—Secretarial Practice.....	.....	.....	5(3)
B. Ed. 21-22-23—Advanced Typewriting.....	6(4)	6(4)	6(4)
B. Ed. 24-25-26—Advanced Shorthand.....	6(4)	6(4)	6(4)
<b>TOTAL FOR SECOND YEAR.....</b>	<b>(15)</b>	<b>(15)</b>	<b>(15)</b>

## DESCRIPTION OF COURSES

Acct. 11-12-13. **INTRODUCTION TO BUSINESS.**—A general course including a study of current business practices, the vocabulary of business and opportunities for careers in the business world of today. Lectures, 2 hours; 2 units each quarter (applicable toward two-year Certificate in Secretarial Science only).

Acct. 21-22-23. **SECRETARIAL ACCOUNTING.**—Basic fundamentals of accounting for secretaries and office managers. Practice in use of calculating equipment. Prerequisites: Acct. 11-12-13, Math 11-12-13. Lectures, 3 hours; laboratory 3 hours; 4 units each quarter (applicable toward two-year Certificate in Secretarial Science only).

B. Ed. 11-12-13. **ELEMENTARY TYPEWRITING.**—The development of type-writing skill with emphasis on touch control, speed, and accuracy. Problem typing of business letters and forms, tabulation, centering, and brief study of machine parts of electric and manual machines. Lectures, 3 hours; laboratory, 3 hours; 4 units each quarter (applicable toward two-year Certificate in Secretarial Science only).

B. Ed. 14-15-16. **ELEMENTARY SHORTHAND.**—Gregg Shorthand, Diamond Jubilee, practice in writing and reading shorthand notes. Brief forms, phrasing, dictation, and transcription at moderate rates. Must be taken simultaneously with B. Ed. 11-12-13. Lectures 3 hours; laboratory 3, hours; 4 units each quarter (applicable toward two-year Certificate in Secretarial Science only).

B. Ed. 24-25-26. **ADVANCED SHORTHAND.**—A continuation of Elementary Shorthand with emphasis upon abbreviating principles, increased speed in dictation and transcription of mailable letters. Prerequisite: B. Ed. 14-15-16. Lectures, 3 hours; laboratory, 3 hours; 4 units each quarter (applicable toward two-year Certificate in Secretarial Science only).

B. Ed. 27. **SECRETARIAL PRACTICE.**—Application of material presented previously to the problems of office efficiency and human relations. Additional instruction in the use of office machines as well as the most effective ways of completing office tasks.

Econ. 21-22. **INTRODUCTORY ECONOMICS.**—A basic course covering the principles of money and banking, business cycles, the production, distribution and consumption of goods and services and the economic characteristics of American business and industry as a whole. Lectures, 3 hours; 3 units each quarter (applicable toward two-year Certificate in Secretarial Science only).

Eng. 11-12-13. **COMMERCIAL ENGLISH.**—The first quarter concentrates upon basic grammar; the second quarter offers composition and rhetoric; the final quarter presents business correspondence, the English of salesmanship and preparation of reports. Lectures, 3 hours; 3 units each quarter (applicable toward two-year Certificate in Secretarial Science only).

Math. 11-12-13. **BUSINESS ARITHMETIC.**—Practical problems in interest, discounts, percentage, and taxes. Study of business statements, payroll records, annuities, graphs, stocks and bonds, overhead, inventory, turnover, and depreciation. Lectures, 3 hours; 3 units each quarter (applicable toward two-year Certificate in Secretarial Science only).

## SPECIAL COURSES FOR NURSES

Bacteriology N1-MICROBIOLOGY.—Study of microscopic organisms, with special emphasis on those which cause disease. Lectures, 2 hrs.; laboratory 3 hrs.; 3 units.

Chemistry N1-N2—CHEMISTRY FOR NURSES.—A study of the general principles of inorganic, organic, and physiological chemistry, emphasizing their relationships to other courses and to nursing experiences. Lectures, 3 hrs.; laboratory 3 hrs.; 4 units.

Mathematics N1-MATHEMATICS FOR NURSES.—A review of arithmetic and algebra with special emphasis on calculations involving dosages of drugs and concentrations of solutions. Lectures 5 hrs.; 5 units.

## PRE-COLLEGE FOUNDATIONS

### A REVIEW OF BASIC SUBJECTS TO STRENGTHEN BASIC SKILLS

**GENERAL INFORMATION.**—The pre-college foundations program is a one-year course of study designed to strengthen knowledge and skills in basic subject matter fields including English grammar, English composition, basic mathematics—from arithmetic to trigonometry—and chemistry; to develop study habits and reading skills.

This course is designed for high school graduates who meet the subject-matter requirements for admission to Virginia Polytechnic Institute but have not yet demonstrated a level of achievement sufficiently high to justify admission to the regular academic program. Admission will be limited to those students recommended by their high school principals as being potential college students.

The purposes of this program are: (1) to provide the opportunity for late-maturing students to demonstrate their ability to do college work and (2) to provide the means by which these students can repair the weaknesses in their background before attempting advanced work at the college level.

The Clifton Forge-Covington Community College, a division of Virginia Polytechnic Institute, will offer this program for the first time during the 1965-66 academic year. Students will normally be required to pursue this as a full-time program. Since the individual courses will be co-related with each other a part-time student would miss essential parts of the program.

**PROCEDURE FOR ADMISSION.**—Applicants for admission should apply by letter or in person to the Admissions Office, Clifton Forge-Covington Division of Virginia Polytechnic Institute, Clifton Forge, Virginia. Application forms will then be sent to the applicant. These forms must be completed in their entirety and returned to the Director of the Community College, and if found satisfactory, the applicant will be sent the proper admission notice.

**ENTRANCE REQUIREMENTS.**—The entrance requirements to enter the Pre-College Foundations Program include graduation from an accredited high school with at least 16 units. The applicant must meet all admission requirements to the academic program (see page 7) except that the equivalent of one unit in mathematics may be made up in the course of this program. Scholastic Aptitude Tests and the Achievement Tests in mathematics and English of the College Entrance Examination Board are required of applicants in this program.

**REQUIREMENTS FOR GRADUATION.**—A certificate of completion will be awarded to all candidates who have completed the total program as described here with a 2.0 quality point average, a (C) average.



PROGRAM OF STUDY

PRE-COLLEGE FOUNDATIONS	I	II	III
Chem. P1-P2—Review of High School Chemistry.....	(3)	(3)	(5)
Engl. P1-P2-P3—English Grammar and Composition.....	(5)	(5)	(3)
Math. P1-P2-P3—Review of High School Mathematics.....	(3)	(3)	(3)
Phys. P1—Review of High School Physics.....	(2)	(2)	(3)
Psych. P1-P2-P3—Orientation and Counselling.....	(3)	(3)	(2)
Read. P1-P2-P3—Reading Improvement.....	(3)	(3)	(3)
Units each quarter.....	(16)	(16)	(16)

DESCRIPTION OF COURSES

Chemistry P1. REVIEW OF HIGH SCHOOL CHEMISTRY.—A general review of high school chemistry with emphasis on basic fundamentals and stoichiometry. Lectures 3 hrs.; 3 units.

English P1-P2-P3. ENGLISH GRAMMAR AND COMPOSITION.—A comprehensive review of English grammar and good English usage. Students will be required to prepare frequent written themes depending upon library research. Lectures 5 hrs.; 5 units.

Mathematics P1-P2-P3. REVIEW OF HIGH SCHOOL MATHEMATICS.—The first quarter will involve a review of high school algebra. The second quarter will cover geometry and the third quarter trigonometry. Lectures 3 hrs.; 3 units.

Physics P1. REVIEW OF HIGH SCHOOL PHYSICS.—A review of the principles of electricity, optics and elementary mechanics. Lectures 3 hrs.; 3 units.

Psychology P1-P2-P3. ORIENTATION AND COUNSELING. — The object of this course is to give each student the opportunity to develop the best possible study habits and to have an opportunity to speak with qualified counselors. Hours to be arranged; 2 units.

Reading P1-P2-P3. READING IMPROVEMENT.—The purpose of this course is to improve the reading speed and comprehensive capacity of the students. Where special reading problems are discovered an opportunity for special work will be offered. Lectures 3 hrs.; 3 units.