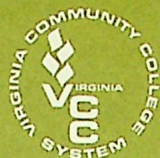


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VIRGINIA WESTERN COMMUNITY  
COLLEGE, ROANOKE, VIRGINIA

# VIRGINIA WESTERN COMMUNITY COLLEGE



CATALOG 1968-1969



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ROANOKE, VIRGINIA

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**VIRGINIA  
WESTERN  
COMMUNITY  
COLLEGE  
BULLETIN**



**CATALOG ISSUE 1968-1969**

**Program Approved By**  
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**VIRGINIA STATE DEPARTMENT OF COMMUNITY COLLEGES**

**VIRGINIA STATE COUNCIL FOR HIGHER EDUCATION**

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It is the student's responsibility to become completely familiar with the College regulations and other important material in this catalog.

# **GENERAL INFORMATION**

## **THE COLLEGE**

Virginia Western Community College is a two-year institution of higher education established under a state-wide system of Community Colleges in the Commonwealth of Virginia, and serving an area within driving distance of the City of Roanoke. This includes Botetourt County, Craig County, Franklin County, and Roanoke County. The areas covered have a population of approximately two hundred and fifty thousand, with a heavy projected growth within the next 25 years.

The College operates under the policies established by the State Board for Community Colleges and with the support and advice of a local Community College Advisory Board. It is financed primarily by State funds supplemented by contributions from the various local political subdivisions, individuals, and businesses.

## **HISTORY**

Since 1927 the Extension Division of the University of Virginia, its programs under the direction and supervision of the University, has served students in the Roanoke Valley. In 1960 the area's educational opportunities were further expanded by establishment of the Roanoke Technical Institute, its programs an extension of Virginia Polytechnic Institute. In February of 1966 by authorization of the State Legislature, these two existing facilities were combined into the comprehensive community college now known as Virginia Western Community College.

## **PURPOSE**

Virginia Western Community College is dedicated to the belief that each individual should be given a continuing opportunity for the development and extension of his skills and knowledge along with an opportunity to increase his awareness of his role and responsibility in society. The College is devoted to serving the educational needs of its community and assumes a responsibility to help meet the requirements for trained manpower in the region through a cooperative effort with local industry, business, professions, and government.

A variety of educational opportunities is provided for post high school age youth and adults. This includes high quality instructional programs at the associate degree level and at the preparatory or foundations level. A strong guidance and counseling program plus a

number of other student services is also provided to help each student make sound decisions regarding his occupational, educational, and personal-social plans.

### **PROGRAMS**

Virginia Western Community College is a comprehensive institution of higher education, offering programs of instruction generally extending not more than two years beyond the high school level. Programs include:

1. *Occupational-Technical Education.* The occupational and technical education programs are designed to meet the increasing demand for technicians, semiprofessional workers, and skilled craftsmen for employment in industry, business, the professions, and government. The curricula are planned primarily to meet the needs for workers in the region being served by the College.
2. *University Parallel-College Transfer Education.* The university parallel-college transfer program includes college freshman and sophomore courses in arts and sciences and preprofessional programs meeting standards acceptable for transfer to baccalaureate degree programs in four-year colleges and universities.
3. *General Education.* The programs in general education encompass the common knowledge, skills, and attitudes needed by each individual to be effective as a person, a member of a family, a worker, a consumer, and a citizen.
4. *Continuing Adult Education.* Adult education programs are offered to enable the adults in the region to continue their learning experiences. This work includes both degree credit and non-degree credit work during the day and evening hours.
5. *Special Training Programs.* Special training may be provided where specific job opportunities are available for new or expanding industries. This special training shall be coordinated with Virginia's economic expansion efforts and with the needs of employers.
6. *Preparatory (Foundation) Programs.* Foundations and developmental programs are offered to help prepare individuals for admission to the occupational-technical program and to the university parallel-college transfer program in the Community College. These programs are designed to help the individual develop the basic skills and understandings necessary to succeed in other programs of the community college.
7. *Specialized Regional and Community Services.* The facilities and personnel of the College are available to provide specialized services to help meet the cultural and educational needs of the region served by the Community College. This service includes



the non-classroom and non-credit programs, cultural events, workshops, meetings, lectures, conferences, seminars, and special community projects which are designed to provide needed cultural and educational opportunities for the citizens of the region.

### **RECOGNITION**

The College is a division of the Virginia Community College System and is approved by the State Board for Community Colleges and by the State Department of Community Colleges in Virginia. The Associate Degree Programs of the College have also been approved by the State Council of Higher Education for Virginia. In December of 1967, the Southern Association of Schools and Colleges accepted Virginia Western Community College as a recognized candidate for accreditation.

# COLLEGE CALENDAR

## FALL—1968

Orientation Day for New Students .....	September 25
Registration .....	September 26-27
Classes Begin .....	September 30
Last Day to Add or Change Classes .....	October 4
Last Day for Withdrawal Without Penalty .....	October 18
Mid-term Grade Reports .....	November 5
Thanksgiving Recess .....	November 28-30
Classes End .....	December 11
Final Exams .....	December 12-14

## WINTER—1969

Orientation Day for New Students .....	January 2
Registration .....	January 2-3-4
Classes Begin .....	January 6
Last Day to Add or Change Classes .....	January 10
Last Day for Withdrawal Without Penalty .....	January 24
Mid-term Grade Reports .....	February 11
Washington's Birthday .....	February 22
Classes End .....	March 17
Final Exams .....	March 18-20

## SPRING—1969

Orientation Day for New Students .....	March 26
Registration .....	March 27-28
Classes Begin .....	March 31
Last Day to Add or Change Classes .....	April 4
Last Day for Withdrawal Without Penalty .....	April 18
Mid-term Grade Reports .....	May 6
Memorial Day .....	May 30
Classes End .....	June 9
Final Exams .....	June 10-12
Graduation .....	June 14

## SUMMER—1969

(Full ten-week session)

Orientation Day for All Students .....	June 16
Registration .....	June 16
Classes Begin .....	June 17
Last Day to Add or Change Classes .....	June 23
Independence Day .....	July 4

**SUMMER—1969**

Last Day to Withdraw Without Penalty .....	July 8
Mid-term Grade Reports .....	July 23
Classes End .....	August 26
Final Exams .....	August 27-29

(Two five-week terms with double class periods)

**First Term**

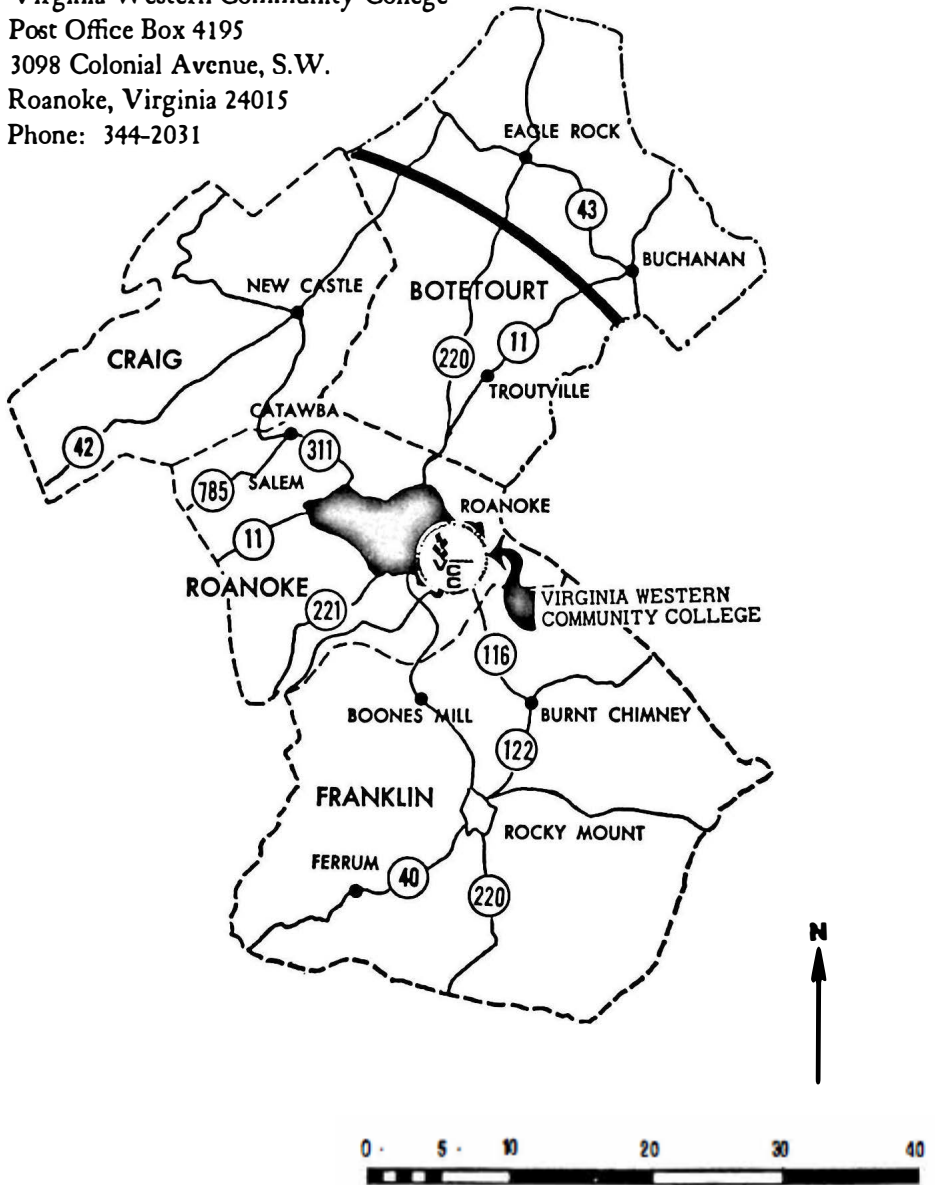
Orientation Day for All Students .....	June 16
Registration .....	June 16
Classes Begin .....	June 17
Last Day to Add or Change Classes .....	June 19
Last Day for Withdrawal Without Penalty .....	June 26
Independence Day .....	July 4
Mid-term Grade Reports .....	July 7
Classes End .....	July 22
Final Exams .....	July 23-24

**Second Term**

Orientation Day for All Students .....	July 25
Registration .....	July 25-26
Classes Begin .....	July 28
Last Day to Add or Change Classes .....	July 30
Saturday Classes (Monday Sections) .....	August 2
Last Day for Withdrawal Without Penalty .....	August 6
Mid-term Grade Reports .....	August 14
Saturday Classes (Tuesday Sections) .....	August 16
Classes End .....	August 27
Final Exams .....	August 28-29

**ROANOKE AREA**

DR. HAROLD H. HOPPER, *President*  
Virginia Western Community College  
Post Office Box 4195  
3098 Colonial Avenue, S.W.  
Roanoke, Virginia 24015  
Phone: 344-2031



**GOVERNING BOARD  
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DANA B. HAMEL, *Director*

**VIRGINIA WESTERN COMMUNITY COLLEGE**

Advisory Board

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W. S. RUSSELL, *Chairman*  
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Roanoke, Virginia 24015

BARTON W. MORRIS, JR.  
(344-3211)

Executive Editor  
The Roanoke World News  
Roanoke, Virginia 24011

S. COLSTON SNEAD, JR. (389-8161)  
President and Trust Officer  
Farmers National Bank of Salem  
Salem, Virginia 24153

DR. FRANK B. WOLFE (483-5212)  
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Rocky Mount, Virginia 24151

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Administrative Vice President  
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Roanoke, Virginia 24015  
(344-5571)

PAUL R. THOMPSON, *Manager*  
(389-7011)  
Employee and Community Re-  
lations  
General Electric Company  
Salem, Virginia 24153

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Vinton, Virginia 24179

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 Norfolk and Western Railway  
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 Roanoke, Virginia 24016

MRS. HUNTER PAINTER (343-2439)  
 Fincastle, Virginia 24090

BASIL WATKINS (864-2301)  
 Superintendent of Schools  
 Craig County  
 New Castle, Virginia 24127

**PRESIDENT**

HAROLD H. HOPPER

**ADMINISTRATION**

HAROLD H. HOPPER	<i>President</i>
Ed.D.—University of Florida, 1965	
E. JOSEPH SCRAFFORD	<i>Dean of Instruction</i>
Ph.D.—Ohio State University, 1964	
ARTHUR J. LAND	<i>Dean of Student Services</i>
Ed.D.—University of Florida, 1968	
HARRY C. RACE	<i>Coordinator of Engineering Technologies</i>
M.S.—Radford College, 1965	
RICHARD F. LANCASTER	<i>Coordinator of Library Services</i>
M.S.L.S.—University of North Carolina, 1964	
JEAN M. SAUNDERS	<i>Coordinator of Admissions and Records</i>
M.Ed.—Virginia Polytechnic Institute, 1967	
JAMES N. McCABE	<i>Business Manager</i>
A.B.—West Virginia University, 1940	

**FACULTY****FULL-TIME**

Edward L. Beale M.S.C.E.—Virginia Polytechnic Institute, 1966	Asst. Professor Civil Engineering Technology
T. Franklin Belvin B.S.—Virginia Polytechnic Institute, 1965	Instructor Economics
Albert A. Blomberg B.S.—Northeastern University, 1968 Certificate—New England Aircraft School, 1950	Asst. Professor Automotive Technology
Betty R. Bowman M.Ed.—Virginia Polytechnic Institute	Instructor Secretarial Science
R. Irving Broughton M.A.—Florida State University, 1967	Instructor Speech Communications
John V. Brust B.S.—University of Cincinnati, 1963	Instructor Art
Guy R. Carr B.S.—Virginia Polytechnic Institute, 1942	Asst. Professor Mechanical Technology
Joseph W. Cohron M.A.—Ohio University, 1941	Asst. Professor Speech and Drama
Betty C. Craig B.A.—Hollins College, 1946	Instructor English
S. Robert Crockett, Jr. M.S.—Radford College, 1967	Instructor English
Richard W. Crites M.S.—Eastern Illinois University, 1968	Instructor Biology
A. Eugene Crotty M.B.A.—University of Virginia, 1957	Professor Business Administration
Earle S. Davis B.S.—U.S. Naval Academy, 1926	Instructor Mathematics
George V. Devins B.A.—San Jose State College, 1939	Asst. Instructor Physical Education
Charles E. Dearborn, Jr. B.S.—Boston University, 1965	Asst. Professor Automotive Technology
H. Haddon Dudley M.A.—College of William and Mary, 1941	Instructor Psychology
Marjorie S. Durling M.A.—West Virginia University, 1950	Instructor English
Sally A. Eads M.A.—University of Virginia, 1967	Instructor History
Martin K. Edgard M.S.—Florida State University, 1968	Instructor Mathematics

John S. Felton B.S.C.E.—Virginia Polytechnic Institute, 1924	Instructor Civil Eng. Technology
James W. Fightmaster M.Ed.—University of Virginia, 1965	Instructor Mathematics
Dawn M. Gill B.S.—Mary Washington College, 1949	Asst. Instructor Biology
Andrew J. Gordon M.S.—Virginia Polytechnic Institute, 1958 C.P.A.—1966	Asst. Professor Accounting
Mignonne Griggs M.Ed.—Virginia Polytechnic Institute, 1961	Asst. Professor Reading
Virgil B. Grow B.S.C.E.—Virginia Military Institute, 1930	Instructor Architectural Technology
Ruth V. Hamilton M.A.—Ohio State University, 1928	Instructor Art
Charles J. Headland M.Ed.—University of Pittsburgh, 1951	Asst. Professor Physics
James P. Hill, Jr. M.Ed.—University of Virginia, 1963	Asst. Professor Chemistry
William E. Hoffman, Jr. A.A.S.—Roanoke Technical Institute, 1964	Asst. Instructor Electrical Technology
James A. Hooven M.A.—New Mexico Highlands University, 1967	Instructor History
Judith L. Hooven M.A.—New Mexico Highlands University, 1966	Instructor English
William M. Houchins M.P.H.—University of North Carolina, 1961	Asst. Professor Health-Physical Education
Richard Kent Hough B.B.A.—Roanoke College, 1967	Instructor Commercial Art
Donald C. Kunze M.A.—Kent State University, 1952	Assoc. Professor Biology
Martin Levine M.Ed.—University of Pittsburgh, 1960	Assoc. Professor Electrical Technology
Edward G. Magruder B.S.—Roanoke College, 1951 Diploma—Commercial Banking—Rutgers University and Stonier Graduate School of Banking, 1960	Instructor Business Management
Edith P. Martin M.F.A.—Pennsylvania State University, 1966	Instructor Art
Gallais E. Matheny M.S.—Virginia Polytechnic Institute, 1939	Assoc. Professor Biology
Clarence C. Mays, Jr. M.Ed.—University of Virginia, 1965	Asst. Professor Spanish



Charles E. McSurdy M.S.—Radford College, 1967	Instructor Mathematics
Kathryn S. McSurdy M.S.—Radford College, 1965	Instructor English
Wayne R. Michie A.A.S.—Roanoke Technical Institute, 1964	Asst. Instructor Electrical Technology
Roy G. Miles M.S.—Northwestern University, 1958	Asst. Professor Geology
Frances T. Mitchell M.S.—Radford College, 1968	Instructor Secretarial Science
Ralph G. Myers M.A.—University of Virginia	Instructor English
James E. Nelson M.S.—Appalachian State University, 1966	Asst. Professor Mechanical Technology
Gwendolyn J. Nickerson M.Ed.—University of Virginia, 1965	Instructor Chemistry
Edward C. Nininger M.A.—Richmond College, 1932	Assoc. Professor History
Emma Sue Phelps M.A.—State University of Iowa, 1946	Asst. Professor Speech and Drama
Hugh B. Phelps M.M.E.—Clarkson College of Technology, 1956	Assoc. Professor Mechanical Technology
J. Carl Poindexter Ph.D.—University of Virginia, 1944	Professor Economics
Raghavendra Rao M.S.—North Carolina State College, 1964	Asst. Professor Biology
Everett S. Read	Instructor Electrical Technology
William R. Ricketts, Jr. B.S.—Virginia Polytechnic Institute, 1956	Instructor Mechanical Technology
Mary K. Sanders Ph.D.—University of North Carolina, 1967	Professor English
William A. Sar M.S.—Clemson University, 1966	Instructor Physics
James C. Sears B.S.—Roanoke College, 1968	Instructor Electrical Technology
Edwin V. Selander M.S.—Virginia Polytechnic Institute, 1967	Asst. Professor Mathematics
Mary V. Selander M.A.—Pennsylvania State University, 1959	Instructor Mathematics
Mary M. Shirey M.A.—Columbia University, 1935	Instructor French

William T. Shirley M.A.—University of North Carolina, 1950	Asst. Professor History
Milton S. Smith Ph.D.—Fordham University, 1955	Professor English
Woody R. Smith B.S.—Roanoke College, 1965	Instructor Electrical Technology
Albert W. Stewart B.S.—Virginia Polytechnic Institute, 1957	Asst. Professor Electrical Technology
John L. Thompson B.A.—Roanoke College, 1928	Asst. Instructor English
Millard C. Townsend B.A.—Mercer University, 1928	Instructor Business Administration
Laverne L. Trahin M.S.—Radford College, 1965	Instructor Psychology
W. Barry Vinson B.S.—East Texas State University, 1965	Instructor Sociology
Eleanor H. Wall B.S.—Winthrop College, 1965	Instructor Secretarial Science
Barbara H. White M.S.—Radford College, 1966	Instructor English
Roy R. White Ph.D.—University of Florida, 1960	Assoc. Professor History and Government
Robert J. Wilkinson, Jr. M.Ed.—University of Virginia, 1968	Instructor Sociology
James H. Wilson A.A.S.—Roanoke Technical Institute, 1965	Asst. Instructor Mechanical Technology
Benjamin F. Zirkle, III M.S.—Roanoke College, 1968	Instructor Mathematics

#### PART-TIME FACULTY

Dennis J. Barnes M.Ed.—North Carolina State College, 1956	Mathematics
Alan C. Bostwick S.M.M.—Union Theological Seminary, N.Y., 1962	Music
Ralph E. Bice, Jr. B.S.E.E.—University of Alabama	Mathematics
Julia W. Chilson M.B.A.—Rollins College, 1964	Business Administration
C. Dale Elliott M.S.E.E.—University of Tennessee, 1968	Mathematics
Charles B. Farrelly B.F.A.—University of Notre Dame, 1960	Interior Decorating

Leigh B. Hanes, Jr. LL.B.—University of Maryland	Police Science
E. Paul Hayes B.S.—Georgia Institute of Technology, 1966	Traffic Management
Edwin C. Hollenback B.S.—Virginia Polytechnic Institute, 1961	Engineering
Richard L. Lawrence LL.B.—Washington and Lee University, 1964	Business Law
Rosalind L. McFarland B.A.—Radcliffe College, 1939	Mathematics
John R. McMichael B.A.—University of Pittsburgh, 1954	Transportation and Traffic
Kathryn L. Minnich B.A.—University of Cincinnati, 1943	Mathematics
Malcolm L. Minnick, Jr. B.A.—Lutheran Theological Southern Seminary, 1958	Philosophy
Dolores K. Moore Diploma—Lehrerinnen Seminar, 1945 Interpreter's Diploma—Rackow Schule, 1947	German
Jack V. Place M.L.T.—College of William and Mary, 1957	Business Administration
Sammy A. Scott M.Ed.—Duke University, 1949	Mathematics
Madelyn R. Singer M.A.—Teachers College, Columbia University	Mathematics
Kenneth F. Sumner M.S.—Virginia Polytechnic Institute, 1968	Mathematics
Robert A. Young Vocational Industrial Education Certificate	Typography

#### COUNSELING SERVICES

Maurice Strausbaugh M.Ed.—Johns Hopkins University, 1966	Asst. Professor Head, Counseling Services
Ellen Ferretti M.A.—West Virginia University, 1967	Instructor Counselor
P. Joseph Giampocaro M.S.—Radford College, 1966	Instructor Counselor
David P. James, Jr. B.S.—Virginia Polytechnic Institute, 1960	Instructor Counselor
John L. Madison M.Ed.—University of North Carolina, 1959	Asst. Professor Counselor
Margaret H. Traynor M.Ed.—University of Virginia, 1968	Instructor Counselor

# ADMINISTRATIVE INFORMATION

## ADMISSIONS REQUIREMENTS

### General Admission to the College

Any person who has a high school diploma or the equivalent, or who is 18 years of age, and in any case is able to benefit from a program at Virginia Western Community College may be admitted to the College as a regular student or as a special student when the items listed below have been received by the Office of Admissions.

All regular students are required to submit the following items:

1. A completed "Application for Admission as a Regular Student" (NOTE: Social Security Number is required);
2. A \$5.00 application fee (non-refundable unless the requested program is not offered);
3. Official transcripts from all high schools, colleges, and universities attended.

All special students are required to submit a completed "Application for Admission as a Special Student."

After a person has been admitted to the College as a regular student, he will be required to meet with one of the College counselors (a) to discuss the applicant's educational interests, (b) to determine what additional tests he may need, and (c) to plan his application for admission to a specific curriculum or program at the College. He will also be required to submit a health certificate (form to be furnished by the College).

This College does not discriminate on the grounds of race, color, or national origin and is in compliance with the Civil Rights Act of 1964.

### Admission to Specific Curricula

In addition to the general admission requirements listed above, specific requirements are usually prescribed for each curriculum within the College. Among the items generally considered in determining the eligibility of a student for admission to a curriculum in the College are his educational and occupational interests, high school achievements and grades, test results, recommendations from persons who have known the applicant, previous occupational experiences, and other reasonable standards to insure that the student possesses the potential to meet program requirements.

The specific requirements for each curriculum in the College are listed in the Curriculum Offerings section of the College catalog. Per-

sons who do not meet the requirements for a specific curriculum or course may be eligible to enter the curriculum or course after they have completed preparatory course work.

All regular students entering the College will be required to take the ACT test battery of the American College Testing Program at no additional cost to the student as part of the orientation program at the College prior to registration.

Persons applying to enter one of the associate degree (Associate in Science, Associate in Arts, or Associate in Applied Science) programs shall be a high school graduate or the equivalent or have completed an approved preparatory program.

In addition, all students, who plan to transfer to a four-year college or university after completing their program at the Community College will be required to submit their scores on the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board.

### **Special Admissions Requirements for Foreign Students**

In addition to the general admissions requirements of the College, all foreign students must demonstrate proficiency in both written and oral English.

### **Residence Requirements**

Applicants will be required to submit a residence affidavit to determine state residency eligibility for tuition purposes.

When enrollments must be limited for any curriculum or course, first priority must be given to all qualified students who are residents of the political sub-divisions supporting the College, provided such students apply for admission to the program a reasonable length of time prior to registration. The priority list is as follows: (1) residents of the political sub-divisions supporting the College, (2) other Virginia residents, (3) out-of-state and foreign students.

### **Students Transferring from Other Colleges**

Usually, a student transferring from another college who is eligible for reentrance at the last college shall also be eligible for admission to the Community College.

It is the role of the Community College to help each student succeed in a program from which he can benefit. If a transfer student is ineligible to return to a particular curriculum in a previous college, generally he will not be allowed to enroll in the same curriculum in the College until two quarters elapse or until he completes an approved preparatory program at the College. The Admissions Committee of the College shall decide on each case and usually shall impose

special conditions for the admittance of such students, including placement on probation.

Each student transferring from another college should consult the Dean at the Community College for an assessment of credits in order to determine his standing before registering for classes. Generally no credit will be given for subjects with a grade lower than "C," although such grades earned by transfer students at other colleges may be given special consideration. A transfer student may be advised to repeat courses if it is clearly to his advantage to do so in order to make satisfactory progress in his curriculum.

### **Student Applying for Credit or Waiver of Requirements**

Students who have reason to believe that previous educational studies, training programs, or work experience may entitle them to an adjustment in the course work required in a particular curriculum should contact the Dean at the College to determine procedures before registering for classes.

### **Auditing**

A student may audit a course to learn about the subject without having to take the course examination. No credit is given for auditing a course. If a person wishes to change his status in a course from audit to credit, he must do this within the first week of the class. In all cases, permission of the instructor and the Dean is required to audit a class.

## **CLASSIFICATION OF STUDENTS**

All students are classified according to the following categories:

*Regular Student.* A student is designated as a regular student when his file in the Admissions Office contains all of the information required for general admission to the College as a regular student and when he has been admitted to one of the curriculums of the College. A regular student is one of the following:

- (1) A full- or part-time student working toward completion of an associate degree, diploma, certificate, or foundations program;
- (2) A full- or part-time student taking credit courses for transfer to another college or university.

*Special Student.* A special student is one who is permitted to register under special conditions including the following:

- (1) A part-time student taking a course(s) for no credit;
- (2) A high school senior who with the permission of his high school principal is concurrently enrolled in a college course(s);

- (3) A part-time student not enrolled in an associate degree, diploma, or certificate program who may be taking a course(s) for credit. (Such students may later apply to the College for admission to a program as a regular student);
- (4) A person who has not yet fulfilled all of the requirements as a regular student but who is admitted under special consideration by the Admissions Committee of the College.

*Full-time Student.* A student is considered a full-time student if he is carrying 12 or more credits of course work.

*Part-time Student.* A student is considered a part-time student if he is carrying less than 12 credits of course work.

*Freshman.* A student is classified as a freshman until he has completed 45 credits of work in his designated curriculum.

*Sophomore.* A student is considered a sophomore after he has completed 45 or more credits of course work in his designated curriculum. Transferred credits are included providing they apply toward meeting the requirements of the student's curriculum.

## EXPENSES

### Application Fee

An application fee of \$5.00 must accompany the application for admission to the College for each student. This fee is not applicable to tuition, nor refundable unless the requested program is not offered.

### Tuition

Full-time Student (12 or more credits):

Virginia Resident	\$ 45.00 per quarter
Out-of-State Resident	150.00 per quarter

Part-time Student (less than 12 credits):

Virginia Resident	4.00 per credit (or equivalent)
Out-of-State Resident	12.50 per credit (or equivalent)

A Virginia resident is one who has been domiciled in, and is and has been an actual bona fide legal resident of Virginia, for a period of at least one year prior to the commencement of the term or quarter for which he is enrolling.

Payment of tuition also enables the student to obtain a student identification card making him eligible to use the library, bookstore, parking lot, student lounge, and other facilities of the College. There are no special laboratory or library fees but students are expected to pay charges for any school property (such as laboratory or shop equipment, supplies, library books and materials) that they damage or lose.

### **Books and Materials**

Students are expected to obtain their own books, supplies, and consumable materials needed in their studies. It has been estimated that the cost of these items will average \$35-\$50 per quarter for the average full-time student.

### **Refunds**

Authorized refunds will be as follows for students withdrawing from the College: (a) within first 15 class days of a quarter, refund will be 2/3 of tuition; (b) within first 16-35 class days of a quarter, refund will be 1/3 of tuition; (c) after 35 class days of a quarter have elapsed, no refund will be made. If a course is cancelled, there will be a refund of tuition for that course. No refunds for tuition will be made after the first week of classes for individual course changes or for an individual class which is dropped. For part-time students who withdraw from the College, refunds will be prorated on the above schedule.

Official resignation for a student shall become effective on the date that written notification of intent to resign is received by the Office of Admissions and Records, and is not the date of the last class attended, unless the two dates coincide.

### **CREDITS**

A credit is equivalent to one collegiate quarter hour credit or two-thirds of a collegiate semester hour credit.

### **GRADING SYSTEM**

**A** = Excellent = Four grade points per credit.

**B** = Good = Three grade points per credit.

**C** = Average = Two grade points per credit.

**D** = Poor = One grade point per credit.

**F** = Failure = 0 grade points.

**S** = Satisfactory = No grade point credit (Applies only to specialized courses and seminars.)

**U** = Unsatisfactory = No grade point credit (Applies only to specialized courses and seminars.)

**W** = Withdrawal = No credit (A grade of withdrawal implies that student was making satisfactory progress in the course at the time of his withdrawal or that the withdrawal was officially made before the "deadline" date published in the College calendar.)

**I** = Incomplete = No credit (A grade of incomplete is assigned only in cases of student absence from a limited number of class sessions near the end of a term or grading period and when the absence



was for a verifiable unavoidable reason. An "incomplete" must be made up during the next term following its issuance unless special permission for an extension of time is given by the Admissions Committee.)

X = Audit = No credit (Permission of the Instructor and the Dean of Instruction is required to audit a class.)

(The grade point average (G. P. A.) is determined by dividing the total number of grade points earned in courses in the student's curriculum by the total number of credits attempted in the student's curriculum.)

### DEGREES, DIPLOMAS, AND CERTIFICATES

The Community College offers the following degrees, diplomas, or certificates for students who successfully complete approved programs at the College:

(1) *Associate in Arts degree (A. A.)* is awarded to students majoring in the liberal arts and who may plan to transfer to a four-year college or university after completing their community college program.

(2) *Associate in Science degree (A. S.)* is awarded to students majoring in specialized curriculums such as business administration, teacher education, pre-engineering, and other pre-professional programs and who may plan to transfer to a four-year college or university after completing their community college program.

(3) *Associate in Applied Science degree (A. A. S.)* is awarded to students majoring in one of the occupational-technical curriculums and who may plan to obtain a full-time job immediately upon graduation from the community college.

(4) *Diploma* is awarded to students who complete one of the two-year diploma occupational curriculums.

(5) *Certificate* is awarded to students who complete one of the approved curriculums that are less than two years in length.

### GRADUATION REQUIREMENTS

#### Associate Degree Requirements

To be eligible for graduation with an Associate Degree from the College, a student must have:

- (1) Fulfilled all of the course requirements of his particular curriculum as outlined in the College catalog;
- (2) Been recommended for graduation by the major department in his curriculum;
- (3) Completed at least 97 credits applicable to an associate degree of which 45 credits must be acquired at the College;

- (4) Completed the general education requirements (course work in economics, English, government, orientation, and psychology) for an associate degree;
- (5) Earned a grade point average of at least 2.0 on all work attempted and which is applicable toward graduation in his particular curriculum;
- (6) Filed an application for graduation in the Office of Admissions and Records;
- (7) Resolved all financial obligations to the College and returned all materials including library books.

### **Diploma Requirements**

To be awarded a diploma from the College, a student must have:

- (1) Fulfilled all of the course requirements of his particular curriculum as outlined in the College catalog;
- (2) Been recommended for graduation by the appropriate instructional authority in his curriculum;
- (3) Completed at least 97 credits applicable to a diploma of which 45 credits must be acquired at the College;
- (4) Completed the general education requirements (course work in economics, English, government, orientation, and psychology) for a diploma;
- (5) Filed an application for graduation in the Office of Admissions and Records;
- (6) Resolved all financial obligations to the College and returned all materials including library books;
- (7) Attended graduation exercises.

### **Certificate Requirements**

If a student successfully completes a program of instruction which does not lead to an associate degree or diploma, he may be awarded a certificate. Also, if he pursues a degree or diploma program but is unable to complete the degree or diploma requirements, he may, upon the recommendation of the appropriate instructional division and the Dean of Instruction, be issued a certificate provided the portion of study successfully completed is equivalent to an approved certificate program offered at the College.

## **ACADEMIC REGULATIONS**

### **Attendance**

Registration in a course presupposes that regularly scheduled classes and laboratory sessions will be attended. When absence from a class

becomes necessary it is the responsibility of the student to inform the instructor prior to the absence whenever possible. Frequent unexplained absences may result in dismissal from a course.

The student is responsible for making up all work missed during an absence. If a student fails to appear for a test or final examination he should contact the instructor. The granting of requests for late examinations is left to the discretion of the instructor involved.

The classroom and laboratory are central to the education programs of the College, and require regular attendance to achieve the learning goals of those programs. Any instruction missed and not made up may, regardless of the reason for the absence, affect the grade of the student concerned.

### **Change of Registration**

In all cases students should follow established procedures for making any change in their programs after registration. Failure to do so could place their college record in jeopardy.

(1) **Withdrawal from a class:**

Withdrawal from a class without academic penalty may be made within the first three weeks after the beginning of a quarter. If a student's work has been passing up to that time, he will receive a grade of "W" for withdrawal. After that time the student may receive a grade of "W" if his work has been satisfactory or will receive a failing grade of "F" if his work has been unsatisfactory up to the time of official withdrawal. In all cases the word "Withdrawn" will be written on his permanent academic record.

(2) **Addition of a course:**

In most cases a student may not enter a new class after the first week of a quarter. Any request for entry after that period must be approved by the instructor concerned and the Dean of Instruction.

(3) **Withdrawal from the College:**

A student who wishes to withdraw from the College should contact a counselor to determine the appropriate procedure. Failure to follow established procedures could place the student's college record in doubt and prejudice his return to this or another college.

### **Academic Warning**

Any student who fails to make a grade point average of 2.0 or higher for any one quarter, or who fails any course, will receive an Academic Warning.

**Academic Probation**

Any student who fails to maintain a cumulative grade point average of 1.5 will be placed on academic probation. The statement "Placed on Academic Probation," will be placed on the student's permanent record.

A student on academic probation is required to consult with his counselor and may be required to take less than the normal academic load in his next quarter following this action.

**Academic Suspension**

The student on academic probation who fails to make a grade point average of 1.5 for the next quarter will be subject to academic suspension. Academic suspension normally will be for two quarters unless the student reapplies and is accepted for readmission to another curriculum of the College. The student must apply for readmission under all circumstances of academic suspension. The statement, "Placed on Academic Suspension," will be placed on the student's permanent record.

**Academic Dismissal**

A student who does not maintain at least a 2.0 average for the quarter following reinstatement to the College after having been on academic suspension will be officially dismissed from the curriculum in which he is enrolled. The words, "Placed on Academic Dismissal," will be placed on the student's permanent record. Academic dismissal (from any particular curriculum) normally is permanent unless with good cause the student reapplies and is accepted under special consideration for readmission by the Admissions Committee of the College.

**Examinations**

All students are expected to take their examinations at the regularly scheduled times. No exceptions will be made without the permission of the Dean and of the Instructor of the class.

**Normal Academic Load**

The usual academic load for students is 16-18 credits. The minimum, full-time load is 12 credits; and the normal maximum, full-time load is 18 credits. A student wishing to carry an academic load of more than 18 credits ordinarily must have a 3.0 average or higher and must have the approval of the Dean and the student's faculty adviser or counselor.

# STUDENT SERVICES

## COUNSELING

As a service to students and to the community, the College maintains a staff of professional counselors, in addition to faculty advisors, in each instructional program.

The counseling office functions to assist students in making intelligent decisions regarding their vocational, educational, and personal-social plans. As a part of this assistance, students have available appropriate tests, inventories, occupational and educational information, and information regarding financial assistance or employment.

The counseling service provides individual attention and supplementation to the instructional program of the College. A major emphasis is made in the utilization of effective techniques to assist students in realizing self-understanding, evaluating alternatives and formulating appropriate goals as they make independent decisions about their educational plans.

## TESTING

A well-planned testing program for all students is coordinated by the Counseling Department. The test batteries of the American College Testing Program (ACT) is required for all new students planning to enter one of the associate degree, diploma, or certificate programs. This ACT test battery is administered at the College and other test centers prior to registration. In addition, all students who plan to transfer to a four-year college or university which requires the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board will be requested to submit these test scores to the Community College.

Tests for students interested in one of the occupational-technical programs are available to provide special information for helping students determine their future occupational and educational plans. In addition, other special tests and interest inventories are available at the Counseling Office.

Instructors in each curriculum of the College also have tests established for their courses and programs.

## ORIENTATION

A three-stage orientation program has been established to acquaint new students with the purposes and programs of the College. The orientation program begins weeks before registration when the student is asked to take the American College Test. Orientation continues when the student meets with a counselor at the College to discuss the student's ACT scores and his educational interests and goals. At this

time a specific or tentative College curriculum is selected by the student.

An orientation day is scheduled for new students just prior to the registration period when there is a thorough discussion of student services, activities, and organizations by officials of the College and student leaders.

In addition to the above, an orientation course is scheduled for each quarter to assist new students in achieving the goals of intellectual development aimed toward academic and skill development, and social-emotional development.

### **FINANCIAL AIDS**

It is the desire of the College that no qualified student be denied the privilege of attendance because of financial need. The Student Financial Aids Committee—composed of representatives of the administrative, counseling, and instructional staffs—is appointed by the President of the College for the purpose of providing information concerning aid programs, administering funds granted by donors, determining need, assessing applications and granting awards.

It is recommended that the Parent's Confidential Statement, as described below, be used to support an applicant's request for financial aid. The Parent's Confidential Statement Form of the College Scholarship Service may be secured from your high school guidance department or from the Married Student's Supplement. Financial aid for a student will not be offered unless he shows intent to enroll in the College. However, all financial need analysis forms received from the College Scholarship Service will be acknowledged, stating the possible aid a student may expect to receive if he plans to attend Virginia Western Community College.

### **Scholarships**

The College participates with the State Teacher's Scholarship, College Scholarship Service and National Merit Programs. Also, a limited number of scholarships are available each year to needy students. These scholarships vary from \$150.00 to \$350.00.

Also available for a freshman and a sophomore in Electrical Engineering Technology is the \$150.00 Elis Olsson-Chesapeake Corporation scholarship sponsored by the Chesapeake Corporation of Virginia at West Point, Virginia. First preference will be given to a student who lives in or near West Point.

A scholarship fund sponsored by the Electrical Contractors Association of Virginia is available to a Pre-Engineering student who plans to study Electrical Engineering. The scholarship should adequately cover tuition and books for the two years at Virginia Western and

for two years at a university. At this time the stipulation is for the recipient to attend his last two years at Virginia Polytechnic Institute.

### **Part-Time Employment**

Assistance in securing part-time employment is available to students throughout the year. An effort is made to place students in job fields which relate to their college programs. Students who work more than 20 hours per week are advised to adjust their course loads accordingly.

### **Work-Study Program**

Numerous jobs on campus are available each year under the Work-Study Program for full-time students who are in financial need and qualify for participation in this program. Application forms are available in the office of the Counseling Department.

### **Student Loans**

Students who need student loans should contact the Counseling Department for information.

Students who are residents of Virginia are eligible to apply for loans under the State Education Assistance Authority Plan. Loans are made through commercial banks at favorable interest rates and are repayable in monthly installments beginning nine months after the student graduates or after he leaves college. For details about the program or a list of participating banks, contact the College or write to the State Education Assistance Authority, 1010 State-Planters Building, Richmond, Virginia 23219.

Other financial aid plans may be added throughout the year. Interested students may inquire through the Counseling Department.

### **National Defense Student Loan Program**

The College participates in the National Defense Student Loan Program. At this time, loans up to \$300.00 a year are made. This amount adequately covers tuition and books for one year. Interest at the rate of three per cent per year is charged and payments do not begin until nine months after the recipient graduates from college or otherwise leaves college.

If a student enters the military service, interest and payments are deferred until nine months after he is discharged. Recipients who enter the teaching profession may cancel up to fifty per cent of the loan. To apply for this loan, it is recommended that students complete the Parent's Confidential Statement or the Married Student's Supplement.

**Vocational Rehabilitation**

The College cooperates with the State Department of Vocational Rehabilitation in providing education and training for persons with handicaps.

**Veterans**

Programs and courses of instruction at this College are approved by the Veterans Administration.

**PLACEMENT SERVICE**

The College maintains a placement service in the Counseling Department for students who wish to secure part-time or full-time employment while attending college, during vacations, or after graduation. Occupational information on job requirements and opportunities is provided in the Counseling Department. The College maintains continuous contact with the State Employment Service, business, industry, the professions and government for the latest information about jobs.

During the winter and spring quarters, industries and businesses actively recruit on campus to offer employment to those students in the Occupational-Technical Programs. Students in the College Transfer Programs who do not plan to continue their education may also have interviews, provided they register with the counselor in charge of placement.

Students who seek part-time work are encouraged to do so with a view to their future career plans. The experience gained will assist them in finding permanent and satisfying positions.

**SNACK BAR**

A temporary snack bar has been erected on the west side of the main building. This is being operated commercially. The room serves as a student lounge. Lunches are available at reasonable cost.

**PARKING**

Until further development of the campus, parking will be a problem. Students are urged to follow the regulations with regard to parking in the parking lots as well as on the two sides of Colonial Avenue. Cars parked in a manner endangering the welfare of others will be removed at the owner's expense.

**STUDENT ACTIVITIES**

The student activities program is designed to provide a variety of meaningful educational, cultural, and social experiences and to supplement the academic program.



There are several major areas of student activities, such as Student Government, curriculum-related clubs and organizations, and service clubs.

## **STUDENT HANDBOOK**

A student handbook is available to provide additional information of interest. The handbook describes student activities and organizations and lists the College rules and regulations governing student affairs.

## **STUDENT CONDUCT**

Each individual is considered a responsible adult, and it is assumed that men and women of college age will maintain standards of conduct appropriate to membership in the college community. Emphasis is placed on standards of student conduct rather than on limits or restrictions of students. Guidelines and regulations governing student conduct usually are developed by representatives of the students, faculty, counseling staff, and administration. The College refrains from imposing a rigid code of discipline but reserves the right to take disciplinary action compatible with its own best interest when it is clearly necessary. The regulations shall become official by administrative statement.

Failure to meet standards of conduct acceptable to the College may result in disciplinary probation or dismissal, depending upon the nature of the offense. A disciplinary probation period, unless otherwise specified, is for the duration of one quarter. A student who is dismissed must reapply to the College and will normally be required to appear before a special committee before readmission can be granted.

The Virginia Community College System guarantees to each student the privilege of exercising his rights of citizenship under the Constitution of the United States without fear of prejudice. Special care is taken to assure due process and to spell out clearly-defined routes of appeal when a student feels his rights have been violated.

Basically, students of the Community Colleges are expected to conduct themselves as ladies and gentlemen, both within the Colleges and elsewhere. For student conduct which tends to discredit or injure the College, the State Director is authorized by the State Board for Community Colleges to impose such penalty as he may deem appropriate, including expulsion from the College. This authority has been delegated by the Director to the Administration of each Community College, subject to review by the Director or his delegated representative. When the penalty for misconduct is suspension or dismissal the student may appeal the decision to the Local Advisory Board. Final appeal may be made to the State Board for Community Colleges.

Any student found guilty of participating in or inciting a riot or

an unauthorized or disorderly assembly is subject to suspension or dismissal.

To prevent misunderstanding, the Director (of the Virginia Community College System) has issued the following clarification:

1. When an assembly on campus of students not authorized by the College has been requested to disband by the President or other designated officer, those refusing to comply will be subject to immediate suspension and/or dismissal and legal action.
2. In the event that an assembly appears to be a demonstration related to grievances, those present should be advised that orderly procedures for the hearing of grievances are available and must be adhered to. College officials will not negotiate with such groups under condition of duress, such as unauthorized occupation of College property.
3. Any unauthorized occupation of buildings and/or College property constitutes reason for immediate suspension and/or dismissal from the institution of students who may be involved. Furthermore, legal action will be brought against any student involved in acts on Community College property that are prohibited by law.
4. Any person currently not a student is not allowed to participate in demonstrations on the campus.

# CURRICULA

## **Associate in Applied Science Degree**

Accounting  
Architectural Engineering Technology  
Business Management  
Civil Engineering Technology  
Commercial Arts  
Communication Technology (Television & Radio)  
Electrical Engineering Technology  
Mechanical Engineering Technology  
Police Science  
Secretarial Science

## **Associate in Arts**

Liberal Arts

## **Associate in Science**

Business Administration  
Pre-Engineering  
Pre-Teacher Education  
Science

## **Diploma Curricula**

Automotive Technology

## **Certificate Curricula**

Mechanical Drafting

## **Other Programs**

Preparatory Foundations Curriculum

## **ACCOUNTING**

*Degree:* Associate in Applied Science

*Length:* Six-Quarter (two-year) Program

*Purpose:* With the rapid development of business and industry in Virginia, there is a great demand for qualified personnel to assist business management in this economic growth. The Associate in Applied Science degree program in Accounting is designed primarily for persons who seek full-time employment in the accounting field imme-

diately upon completion of the community college program. Both persons who are seeking their first employment in an accounting position or those presently in accounting who are seeking a promotion may benefit from this program.

*Occupational Objectives:*

Bank Teller  
Bookkeeper

Comptroller Aide  
Junior Accountant

*Admission Requirements:* In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Applied Science degree program in Accounting requires proficiency in high school English and high school mathematics. Students who are not proficient in English and mathematics will be required to correct their deficiencies in the Preparatory (Foundations) Program before entering the Accounting curriculum.

*Program Requirements:* The first three quarters (first year) of the Associate in Applied Science degree program in Accounting are similar to the program in Business Management. However, in the second year each student will pursue his specialty in accounting and will be required to complete BUAD 214, 215, 216, 217, and 218. Approximately one-half of the curriculum will include courses in accounting with the remaining courses in related subjects, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in accounting. Each student is urged to consult with the Counseling Department and his faculty advisor in planning his program and selecting his electives. Upon completion of the six-quarter program listed below, the student will be awarded the Associate in Applied Science degree with a major in Accounting.

## ACCOUNTING

### Associate in Applied Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIRST QUARTER</b>				
BUAD 111	Accounting I	3	2	4
BUAD 100	Introduction to Business	3	0	3
BUAD 156	Office Machines	1	2	2
ENGL 101	Communication Skills I	3	0	3
MATH 151	Business Mathematics I	3	0	3
GENL 100	Orientation	1	1	1
<b>Total</b>		<b>14</b>	<b>5</b>	<b>16</b>

CURRICULA

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Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>SECOND QUARTER</b>				
BUAD 170	Business Organization & Management	3	0	3
BUAD 112	Accounting II	3	2	4
ENGL 102	Communication Skills II	3	0	3
MATH 152	Business Mathematics II	3	0	3
ECON 160	American Economics	3	0	3
PHED 101	Health, Phys. Ed., or Recreation	<u>0</u>	<u>3</u>	<u>1</u>
Total		15	5	17
<b>THIRD QUARTER</b>				
BUAD 113	Accounting III	3	2	4
BUAD 106	Office Procedures (or Elective)	2	0	2
ENGL 136	Speech Communications	2	2	3
NASC 100	Survey of Science (or Elective)	3	2	4
PSYC 128	Human Relations	3	0	3
PHED 102	Health, Phys. Ed., or Recreation	<u>0</u>	<u>3</u>	<u>1</u>
Total		13	9	17
<b>FOURTH QUARTER</b>				
BUAD 294	Introduction to Business Statistics	3	0	3
BUAD 214	Intermediate Accounting I	4	0	4
DAPR 100	Introduction to Data Processing (or Elective)	3	2	4
ENGL 280	Business English	3	0	3
ECON 216	Industrial Economics (or Elective)	<u>3</u>	<u>0</u>	<u>0-3</u>
Total		16	2	14-17
<b>FIFTH QUARTER</b>				
BUAD 240	Business Finance	3	0	3
BUAD 241	Business Law I	3	0	3
BUAD 215	Intermediate Accounting II	4	0	4
BUAD 220	Cost Accounting	3	0	3
GOVT 180	American Constitutional Government	3	0	3
PHED 103	Health, Phys. Ed., or Recreation	<u>0</u>	<u>3</u>	<u>1</u>
Total		16	3	17
<b>SIXTH QUARTER</b>				
BUAD 242	Business Law II	3	0	3
ECON 246	Money and Banking	3	0	3
BUAD 227	Auditing	3	0	3
BUAD 248	Business Taxes	3	0	3
BUAD 299	Business Administration Seminar & Project	2	0	2
SECR 110	Personal Typing* (or Elective)	<u>0</u>	<u>6</u>	<u>2</u>
Total		14	6	16
Total Minimum Credits for an Accounting Major				97

\*Waiver or equivalent credit may be granted for the student who has satisfactorily completed one year of typing in high school or who demonstrates equivalent competence.

## ARCHITECTURAL ENGINEERING TECHNOLOGY

*Degree:* Associate in Applied Science

*Length:* Six-Quarter (two-year) Program

*Purpose:* This program is concerned with the training of persons to qualify them for positions in the design, planning and supervision of construction of homes, factories, schools, stores and other building projects. The work is both practical and creative and the program is planned for people who will seek full-time employment immediately upon completion of the community college program.

### *Occupational Objectives:*

Draftsman (Architectural)	Building Materials Salesman
Design Detailer	Building Inspector
Building Contractor	Cost Estimator

*Admission Requirements:* In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of the catalog), entry into the Associate in Applied Science degree curriculum in Architectural Engineering Technology requires the satisfactory completion of the following high school units or their equivalent: 4 units of English; 3 units Math (2 algebra, 1 geometry); 1 unit Lab Science.

*Program Requirements:* Students completing the six-quarter planned curriculum listed below will be awarded the Associate in Applied Science degree with a major in Architectural Engineering Technology. The curriculum requires a minimum of 105 credits, including a minimum of 27 credits in mathematics and the natural sciences, a minimum of 18 credits in general education, including English and the social sciences, and a minimum of 53 credits in architectural engineering technology.

## ARCHITECTURAL ENGINEERING TECHNOLOGY

### Associate in Applied Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIRST QUARTER</b>				
ENGL 101	Communication Skills I	3	0	3
MATH 121	*Engineering Technology Mathematics I	5	0	5
DRFT 126	Introduction to Graphic Representation	2	3	3
ENGR 100	Introduction to Engineering Technology	0	3	1
PHED 101	Health, Phys. Ed., or Recreation	0	3	1
PHYS 111	Technical Physics I	3	3	4
GENL 100	Orientation	1	1	1
Total		14	13	18

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Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>SECOND QUARTER</b>				
ENGL 102	Communication Skills II	3	0	3
MATH 122	Engineering Technology Mathematics II	5	0	5
PHYS 112	Technical Physics II	3	3	4
ARCH 114	Architectural Drafting I	1	3	2
ARCH 141	Materials & Methods of Construction I	2	3	3
PHED 102	Health, Phys. Ed., or Recreation	<u>0</u>	<u>3</u>	<u>1</u>
Total		14	12	18
<b>THIRD QUARTER</b>				
ENGL 136	Speech Communications	2	2	3
MATH 123	Engineering Technical Mathematics III	5	0	5
PHYS 113	Technical Physics III	3	3	4
ENGR 151	Mechanics I (Statics)	3	0	3
ARCH 115	Architectural Drafting II	1	3	2
PHED 103	Health, Phys. Ed., or Recreation	<u>0</u>	<u>3</u>	<u>1</u>
Total		14	11	18
<b>FOURTH QUARTER</b>				
ENGR 152	Mechanics II (Strength of Materials)	3	3	4
ARCH 221	Architectural Design I	2	6	4
ARCH 142	Materials & Methods of Construction II	2	3	3
GOVT 180	American Constitutional Government	3	0	3
CIVL 180	Elements of Surveying	<u>3</u>	<u>3</u>	<u>4</u>
Total		13	15	18
<b>FIFTH QUARTER</b>				
ENGR 153	Mechanics III (Dynamics)	2	3	3
ARCH 222	Architectural Design II	2	6	4
PSYC 128	Human Relations	3	0	3
ARTS 126	Free-Hand Sketching	0	6	2
ARCH 204	History of Architecture I	3	0	3
ARCH 236	Building Electric Power Equipment	<u>3</u>	<u>0</u>	<u>3</u>
Total		13	15	18
<b>SIXTH QUARTER</b>				
ARCH 223	Architectural Design III	2	6	4
ARCH 277	Building Codes & Contract Documents	3	0	3
ECON 160	American Economics	3	0	3
ARCH 237	Building Mechanical Equipment	3	0	3
ARCH 205	History of Architecture II	3	0	3
ARCH 299	Seminar and Project in Architectural Technology	<u>2</u>	<u>0</u>	<u>2</u>
Total		16	6	18

\*See Notes on Associate in Applied Science degree programs, pages 74-75.

**BUSINESS MANAGEMENT**

*Degree:* Associate in Applied Science

*Length:* Six-Quarter (two-year) Program

*Purpose:* With the rapid development of business and industry in Virginia, there is a great demand for qualified personnel to assist business management in this economic growth. The Associate in Applied Science degree program in Business Management is designed primarily for persons who seek full-time employment in business management immediately upon completion of the community college program. Both persons who are seeking their first employment in a managerial position or those presently in management who are seeking a promotion may benefit from this program.

*Occupational Objectives:*

- Administrative Assistant
- Junior Executive
- Manager of Business Office
- Manager of Small Business
- Office Assistant
- Supervisor

*Admission Requirements:* In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Applied Science degree program in Business Management requires proficiency in high school English and high school mathematics. Students who are not proficient in English and mathematics will be required to correct their deficiencies in the Preparatory Foundations Program before entering the Business Management curriculum.

*Program Requirements:* The first three quarters (first year) of the Associate in Applied Science degree program in Business Management is similar to the program in Accounting. However, in the second year each student will pursue his specialty in business management. Approximately one-half of the curriculum will include courses in business management with the remaining courses in related subjects, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in business management. Each student is urged to consult with the Counseling Department and his faculty advisor in planning his program and selecting his electives. Upon completion of the six-quarter program listed on the next pages, the student will be awarded the Associate in Applied Science degree with a major in Business Management.



**BUSINESS MANAGEMENT****Associate in Applied Science Degree Program**

<b>Course Number</b>	<b>Course Title</b>	<b>Lecture Hours</b>	<b>Lab Hours</b>	<b>Course Credits</b>
<b>FIRST QUARTER</b>				
BUAD 111	Accounting I	3	2	4
BUAD 100	Introduction to Business	3	0	3
BUAD 156	Office Machines	1	2	2
ENGL 101	Communication Skills I	3	0	3
MATH 151	Business Mathematics I	3	0	3
GENL 100	Orientation	<u>1</u>	<u>1</u>	<u>1</u>
	Total	14	5	16
<b>SECOND QUARTER</b>				
BUAD 170	Business Organization & Management	3	0	3
BUAD 112	Accounting II	3	2	4
ENGL 102	Communication Skills II	3	0	3
MATH 152	Business Mathematics II	3	0	3
GOVT 180	American Constitutional Government	3	0	3
PHED 101	Health, Phys. Ed., or Recreation	<u>0</u>	<u>3</u>	<u>1</u>
	Total	15	5	17
<b>THIRD QUARTER</b>				
BUAD 113	Accounting III	3	2	4
BUAD 106	Office Procedures	2	0	2
ENGL 136	Speech Communications	2	2	3
NASC 100	Survey of Science (or Elective)	3	2	4
PSYC 128	Human Relations	3	0	3
PHED 102	Health, Phys. Ed., or Recreation	<u>0</u>	<u>3</u>	<u>1</u>
	Total	13	9	17
<b>FOURTH QUARTER</b>				
BUAD 294	Introduction to Business Statistics	3	0	3
BUAD 277	Purchasing & Materials Management (or BUAD Elec.)	3	0	3
DAPR 100	Introduction to Data Processing	3	2	4
ENGL 280	Business English	3	0	3
ECON 160	American Economics	<u>3</u>	<u>0</u>	<u>3</u>
	Total	15	2	16

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIFTH QUARTER</b>				
BUAD 240	Business Finance	3	0	3
BUAD 241	Business Law I	3	0	3
BUAD 278	Production Planning (or BUAD Elective)	3	0	3
ECON 216	Industrial Economics (or Elective)	3	0	3
PSYC 226	Psych. Aspects of Management (or Elective)	3	0	3
PHED 103	Health, Phys. Ed., or Recreation	<u>0</u>	<u>3</u>	<u>1</u>
Total		15	3	16
<b>SIXTH QUARTER</b>				
BUAD 242	Business Law II	3	0	3
ECON 246	Money and Banking	3	0	3
BUAD 286	Personnel Management	3	0	3
BUAD 299	Business Administration Seminar & Project	2	0	2
SECR 110	Personal Typing* (or Elective)	0	6	2
	Elective	<u>2-3</u>	<u>0</u>	<u>2-3</u>
Total		13-14	6	15-16
Total Minimum for a Business Management Major				97

\*Waiver may be granted for the student who has satisfactorily completed one year of typing in high school or who demonstrates equivalent competence. Also see Notes on Associate in Applied Science degree programs on pages 74, 75.

## CIVIL ENGINEERING TECHNOLOGY

*Degree:* Associate in Applied Science

*Length:* Six-Quarter (two-year) Program

*Purpose:* The basic purpose of Civil Engineering Technology is to develop qualified engineering technicians proficient in the field of civil technology. To accomplish this purpose, the program is designed to give the student a high degree of proficiency in technical subjects applicable to the field, and to solidly support the technical knowledge with a sound foundation of mathematics, basic science, and English. This enables the technician to communicate mathematically, scientifically, and linguistically with craftsmen as well as the engineer or scientist, and to direct the work of the craftsmen and to supplement and assist in the work of the engineer and scientist. Typical among the wide array of semiprofessional functions performed by the technologist are: drafting, design, development, research, supervision, technical sales, testing and engineering aid.

*Admission Requirements:* In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of the catalog), entry into the Associate in Applied

Science degree curriculum in Civil Engineering Technology requires the satisfactory completion of the following high school units or their equivalent: 4 units English; 3 units Math (2 algebra, 1 geometry or trigonometry); 1 unit Lab Science.

*Program Requirements:* Students completing the two-year planned program listed below will be awarded the Associate in Applied Science degree with a major in Civil Engineering Technology. The program requires a minimum of 108 credits, including a minimum of 27 credits in mathematics and the physical sciences, a minimum of 18 credits in general education, including English and the social sciences, and a minimum of 53 credits in technology (primarily civil).

## CIVIL ENGINEERING TECHNOLOGY

### Associate in Applied Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIRST QUARTER</b>				
ENGL 101	Communication Skills I	3	0	3
MATH 121*	Engineering Technology Mathematics I	5	0	5
DRFT 126	Introduction to Graphic Representation	2	3	3
ENGR 100	Introduction to Engineering Technology	0	3	1
PHYS 111	Technical Physics I	3	3	4
PHED 101	Health, Phys. Ed., or Recreation	0	3	1
GENL 100	Orientation	1	1	1
Total		14	13	18
<b>SECOND QUARTER</b>				
ENGL 102	Communication Skills II	3	0	3
MATH 122	Engineering Technology Mathematics II	5	0	5
PHYS 112	Mechanical Physics II	3	3	4
CIVL 124	Civil Engineering Drafting I	1	3	2
CIVL 140	Construction Planning	2	3	3
PHED 102	Health, Phys. Ed., or Recreation	0	3	1
Total		14	12	18
<b>THIRD QUARTER</b>				
ENGL 136	Speech Communications	2	2	3
MATH 123	Engineering Technology Mathematics III	5	0	5
PHYS 103	Technical Physics III	3	3	4
CIVL 125	Civil Engineering Drafting II	1	3	2
ENGR 151	Mechanics I (Statics)	3	0	3
PHED 103	Health, Phys. Ed., or Recreation	0	3	1
Total		14	11	18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FOURTH QUARTER</b>				
CIVL 256	Soil Mechanics	2	3	3
CIVL 180	Surveying	3	3	4
ENGR 152	Mechanics II (Strength)	3	3	4
	*Technical Elective	3	3	4
GOVT 180	American Constitutional Government	<u>3</u>	<u>0</u>	<u>3</u>
	Total	14	12	18
<b>FIFTH QUARTER</b>				
CIVL 204	Civil Engineering Tecnology I	3	3	4
ENGR 153	Mechanics III (Avanced Strength & Motion)	2	3	3
	*Technical Electives	6	6	8
PSYC 128	Human Relations	<u>3</u>	<u>0</u>	<u>3</u>
	Total	14	12	18
<b>SIXTH QUARTER</b>				
CIVL 205	Civil Engineering Technology II	3	3	4
CIVL 270	Traffic & Transportation Engineering	3	3	4
	*Technical Electives	4	3	5
ECON 160	American Economics	3	0	3
CIVL 299	Seminar and Project in Civil Technology	<u>2</u>	<u>0</u>	<u>2</u>
	Total	15	9	18

\*See Notes on A.A.S. Programs on pages 74, 75.

## COMMERCIAL ARTS

*Degree:* Associate in Applied Science

*Length:* Six-Quarter (two-year) Program

*Purpose:* This curriculum is designed to train persons for employment in the area of commercially applied art, such as in advertising, printing, packaging and illustration.

*Occupational Objectives:*

Commercial Artist  
Designer

Photographer  
Illustrator

*Admission Requirements:* Admission to this program, in addition to the requirements for general admission to the College, requires that the student have a satisfactory aptitude for drawing. Applicants may be required to submit for approval by the Art Department sample drawings before final admission will be granted.

*Program Requirements:* Students completing this curriculum will be awarded an Associate in Applied Science Degree in Commercial

Arts. The curriculum requires a minimum of 102 credits, including at least 18 credits in general education, including English and the social sciences, and a minimum of 80 credits in related Art courses.

## COMMERCIAL ARTS

### Associate in Applied Science Degree Program

#### FIRST QUARTER

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
ENGL 111	Composition I	3	0	3
ARTS 111	History and Appreciation of Art I	3	0	3
ARTS 121	Theory and Practice of Drawing I	1	5	3
ARTS 104	Introduction to the Arts I	3	0	3
ENGR 121	Engineering Graphics I	1	3	2
GENL 100	Orientation	1	1	1
PHED 101	Health, Phys. Ed., or Recreation	0	3	1
Total		12	12	16

#### SECOND QUARTER

ENGL 112	Composition II	3	0	3
ARTS 112	History and Appreciation of Art II	3	0	3
ARTS 122	Theory and Practice of Drawing II	1	5	3
ARTS 166	Fundamentals of Lettering	1	6	3
ARTS 105	Introduction to the Arts II	3	0	3
ENGR 122	Engineering Graphics II	1	3	2
Total		12	14	17

#### THIRD QUARTER

ENGL 113	Composition III	3	0	3
ARTS 113	History and Appreciation of Art III	3	0	3
ARTS 123	Theory and Practice of Drawing III	1	5	3
ARTS 180	Introduction to Photography	1	3	2
GOVT 180	American Constitutional Government	3	0	3
PHED 102	Health, Phys. Ed., or Recreation	0	3	1
Total		11	11	15

#### FOURTH QUARTER

ARTS 231	Theory and Practice of Painting I	1	5	3
ARTS 271	Graphic Techniques I	1	6	3
ARTS 171	Typography I	2	3	3
ARTS 221	Advanced Drawing I	0	6	2
ARTS 261	Advertising Design I	2	3	3
PSYC 128	Human Relations	3	0	3
ARTS 281	Photography Workshop	0	3	1
Total		9	26	18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIFTH QUARTER</b>				
ARTS 232	Theory and Practice of Painting II	1	5	3
ARTS 272	Graphic Techniques II	1	6	3
ARTS 172	Typography II	2	3	3
ARTS 222	Advanced Drawing II	0	6	2
ARTS 262	Advertising Design II	2	3	3
ECON 160	American Economics	3	0	3
ARTS 282	Photography Workshop II	<u>0</u>	<u>3</u>	<u>1</u>
Total		9	26	18
<b>SIXTH QUARTER</b>				
ARTS 233	Theory and Practice of Painting III	1	5	3
ARTS 273	Graphic Techniques III	1	6	3
ARTS 173	Typography III	2	3	3
ARTS 223	Advanced Drawing III	0	6	2
ARTS 263	Advertising Design III	2	3	3
ARTS 283	Photography Workshop III	0	3	1
PHED 103	Health, Phys. Ed., or Recreation	0	3	1
ARTS 299	Seminar and Project in Art	<u>2</u>	<u>0</u>	<u>2</u>
Total		8	29	18

## COMMUNICATION TECHNOLOGY

(Television and Radio)

*Degree:* Associate in Applied Science

*Length:* Six-Quarter (two-year) Program

*Purpose:* With the growth of both commercial and educational television in Virginia, the need for personnel trained in the production and direction of television programs and in the various phases of TV studio operation is expanding. The purpose of this program is to meet this growing need.

*Occupational Objectives:*

- Camera Man
- Script Directors
- Production Assistant
- Studio Technician
- Advertising Agency Assistant

*Admission Requirements:* In addition to the admissions requirements established for the College (as listed in the section on admissions requirements in Part II of the catalog), entry into the Communication Technology Program requires a proficiency in high school English and some artistic talent to be determined by tests and counseling administered at the college.

*Program Requirements:* The curriculum requires a minimum of 19 credits in general education, 60 credits in special television courses, and a total of at least 106 credits.

Students successfully completing the six-quarter sequence in Communication Technology receive an Associate in Applied Science Degree in Communication Technology.

## COMMUNICATION TECHNOLOGY

### Television and Radio

#### Associate in Applied Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIRST QUARTER</b>				
ARTS 101	General Art I	2	3	3
GENL 100	Orientation	1	1	1
GOVT 180	American Constitutional Government	3	0	3
ENGL 100**	Communication Skills I	3	0	3
PHED 101	Health, Phys. Ed., or Recreation	0	3	1
RDTV 111	Introduction to Television I	3	3	4
RDTV 181	Television Workshop I	<u>0</u>	<u>6</u>	<u>2</u>
Total		12	16	17
<b>SECOND QUARTER</b>				
ARTS 102	General Art II	2	3	3
ENGL 102**	Communication Skills II	3	0	3
PHED 102	Health, Phys. Ed., or Recreation	0	3	1
PSYC 128	Human Relations	3	0	3
RDTV 112	Introduction to Television II	3	3	4
RDTV 182	Television Workshop II	<u>0</u>	<u>6</u>	<u>2</u>
Total		11	15	16
<b>THIRD QUARTER</b>				
ARTS 103	General Art III	2	3	3
ENGL 136**	Speech Communications	2	2	3
ECON 160	American Economics	3	0	3
PHED 103	Health, Phys. Ed., or Recreation	0	3	1
RDTV 113	Introduction to Television III	3	3	4
RDTV 183	Television Workshop III	<u>0</u>	<u>6</u>	<u>2</u>
Total		10	17	16

\*\*English 111, 112, 113 sequence is recommended in place of English 101, 102 and 136 if the high school records indicate the student has the necessary background. Also see Notes on A.A.S. degree programs on pages 74, 75.

**FOURTH QUARTER**

<b>Course Number</b>	<b>Course Title</b>	<b>Lecture Hours</b>	<b>Lab Hours</b>	<b>Course Credits</b>
BUAD 100	Introduction to Business	3	0	3
ARTS 261	Advertising Design I	2	3	3
RDTV 281	Television Workshop I	0	6	2
RDTV 221	Television Production I	3	6	5
RDTV 231	Technical Problems of Television I	<u>3</u>	<u>3</u>	<u>4</u>
Total		11	18	17

**FIFTH QUARTER**

BUAD 170	Business Organization and Management	3	0	3
ARTS 262	Advertising Design II	2	3	3
RDTV 282	Television Workshop II	0	6	2
RDTV 222	Television Production II	3	6	5
RDTV 232	Technical Problems of Television II	<u>3</u>	<u>3</u>	<u>4</u>
Total		11	18	17

**SIXTH QUARTER**

ARTS 263	Advertising Design III	2	3	3
RDTV 283	Television Workshop III	0	6	2
RDTV 223	Television Production III	3	6	5
RDTV 233	Technical Problems of Television III	3	3	4
RDTV 226	Television & Radio Newswriting	<u>3</u>	<u>0</u>	<u>3</u>
Total		11	18	17

**ELECTRICAL ENGINEERING  
TECHNOLOGY**

*Degree:* Associate in Applied Science

*Length:* Six-Quarter (two-year) Program

*Purpose:* The rapidly expanding electronics industries have created a great demand for qualified engineering technicians. In recent years the fields of electrical science and electronics have overlapped until today the two are extremely similar. Because of this similarity the educational requirements for students entering these fields are similar.

In order to provide the flexibility required by the large variety of jobs available in the electronics industries the curriculum offers a solid foundation in math, science, and electronics. In addition, the student can specialize in one of the three options—communication electronics, computer electronics, or industrial electronics. The electrical engineering technology curriculum is designed to give the student the broad



electrical background he must have, yet provide an opportunity to gain proficiency in a specific area of interest.

*Admission Requirements:* In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of the catalog), entry into the Associate in Applied Science degree curriculum in Electrical Engineering Technology requires the satisfactory completion of the following high school units or their equivalent: 4 units of English; 3 units Math (2 algebra, 1 geometry); 1 unit Lab Science.

*Program Requirements:* Students completing the six-quarter planned curriculum listed below will be awarded the Associate in Applied Science degree with a major in Electrical Engineering Technology. The curriculum requires a minimum of 106 credits, including a minimum of 27 credits in mathematics and the natural sciences, a minimum of 18 credits in general education, including English and the social sciences, and a minimum of 52 credits in electrical engineering technology.

## ELECTRICAL ENGINEERING TECHNOLOGY

### Associate in Applied Science Degree Program

Technical Options: Communication Electronics, Computer Electronics, Industrial Electronics

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIRST QUARTER</b>				
ENGL 101	Communication Skills I	3	0	3
MATH 121	*Engineering Technology Mathematics I	5	0	5
ENGR 121	Engineering Graphics	1	3	2
ENGR 100	Introduction to Engineering Technology	0	3	1
PHYS 121	College Physics I	3	3	4
PHED 101	Health, Phys. Ed., or Recreation	0	3	1
GENL 100	Orientation	<u>1</u>	<u>1</u>	<u>1</u>
	Total	13	13	17
<b>SECOND QUARTER</b>				
ENGL 102	Communication Skills II	3	0	3
MATH 122	Engineering Technology Mathematics II	5	0	5
PHYS 122	College Physics II	3	3	4
ELEC 111	Electrical Circuits I	4	3	5
ELEC 118	Electrical Shop I	<u>0</u>	<u>3</u>	<u>1</u>
	Total	15	9	18

\*See Notes on Associate in Applied Science degree programs, pages 74, 75.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>THIRD QUARTER</b>				
ENGL 136	Speech Communications	2	2	3
MATH 123	Engineering Technology Mathematics III	5	0	5
PHYS 123	College Physics III	3	3	4
DRFT 256	Electronics Drafting	1	3	2
ELEC 112	Electrical Circuits II	<u>3</u>	<u>3</u>	<u>4</u>
Total		14	11	18
<b>FOURTH QUARTER</b>				
GOVT 180	American Constitutional Government	3	0	3
ELEC 119	Electrical Shop II	0	3	1
ELEC 201	Electrical Engineering Technology	5	3	6
	*Technical Option	3	3	4
ELEC 227	Electrical Measurements	<u>3</u>	<u>3</u>	<u>4</u>
Total		14	12	18
<b>FIFTH QUARTER</b>				
PSYC 128	Human Relations	3	0	3
ELEC 202	Electrical Engineering Technology II	5	6	7
	*Technical Option	3	3	4
PHED 102	Health, Phys. Ed., or Recreation	0	3	1
	*Technical Elective	<u>3</u>	<u>0</u>	<u>3</u>
Total		14	12	18
<b>SIXTH QUARTER</b>				
ECON 160	American Economics	3	0	3
ELEC 203	Electrical Engineering Technology III	5	6	7
	*Technical Option	3	3	4
PHED 103	Health, Phys. Ed., or Recreation	0	3	1
ELEC 299	Seminar and Project in Electrical Technology	2	<u>0</u>	<u>2</u>
Total		13	12	17

\*See Notes on Associate in Applied Science degree programs, pages 74, 75.

## MECHANICAL ENGINEERING TECHNOLOGY

*Degree:* Associate in Applied Science

*Length:* Six-Quarter (two-year) Program

*Purpose:* The basic purpose of Mechanical Engineering Technology is to develop qualified engineering technicians proficient in the field of mechanical technology. To accomplish this purpose, the program is designed to give the student a high degree of proficiency in technical

subjects applicable to the field, and to solidly support the technical knowledge with a sound foundation of mathematics, basic science, and English. This enables the technician to communicate mathematically, scientifically, and linguistically with the craftsman as well as the engineer or scientist, and to direct the work of the craftsman and to supplement and assist in the work of the engineer and scientist. Typical among the wide array of semiprofessional functions performed by the technologist are: drafting design, development research, supervision, technical sales, testing, and engineering aid.

*Admission Requirements:* In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Applied Science degree curriculum in Mechanical Engineering Technology requires the satisfactory completion of the following high school units or their equivalent as a minimum:

- 4 units of English
- 3 units of Math (2 algebra, 1 geometry or trigonometry)
- 1 unit of laboratory science

*Program Requirements:* Students completing the two-year planned program listed below will be awarded the Associate in Applied Science degree with a major in Mechanical Engineering Technology. The program requires a minimum of 108 credits, including a minimum of 27 credits in mathematics and the physical sciences, a minimum of 18 credits in general education, including English and the social sciences, and a minimum of 53 credits in technology (primarily mechanical).

## MECHANICAL ENGINEERING TECHNOLOGY

### Associate in Applied Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIRST QUARTER</b>				
ENGL 101	Communication Skills I	3	0	3
ENGR 100	Introduction to Engineering Technology	0	3	1
ENGR 121	Engineering Graphics I	1	3	2
GENL 100	Orientation	1	1	1
MATH 121	Engineering Technology Mathematics I	5	0	5
PHED and/or HEALTH	Physical Education and/or Health	0-2	6-0	2
PHYS 121	College Physics I	3	3	4
Total		13-15	16-10	18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>SECOND QUARTER</b>				
ENGL 102	Communication Skills II	3	0	3
ENGR 122	Engineering Graphics II	1	3	2
INDT 141	Methods of Manufacturing I	2	3	3
MATH 122	Engineering Technical Mathematics II	5	0	5
PHED and/or HEALTH	Physical Education and/or Health	0-1	3-0	1
PHYS 122	College Physics II	3	3	<u>4</u>
Total		14-15	12-9	18
<b>THIRD QUARTER</b>				
ENGL 136	Speech Communications	3	0	3
ENGR 123	Descriptive Geometry	2	3	3
ENGR 151	Mechanics I (Statics)	2	3	3
MATH 123	Engineering Technical Mathematics III	5	0	5
PHYS 123	College Physics III	<u>3</u>	<u>3</u>	<u>4</u>
Total		15	9	18
<b>FOURTH QUARTER</b>				
ELEC 214	Electricity I	3	3	4
ENGR 152	Mechanics II (Materials)	3	3	4
GOVT 180	American Constitutional Government	3	0	3
INDT 142	Methods of Manufacturing II	2	3	3
MECH 264	Thermodynamics I	<u>3</u>	<u>3</u>	<u>4</u>
Total		14	12	18
<b>FIFTH QUARTER</b>				
ELEC 215	Electricity II	3	3	4
ENGR 153	Mechanics III (motion)	2	3	3
MECH 214	Mechanical Engineering Design	3	3	4
MECH 265	Thermodynamics II	3	3	4
PSYC 128	Human Relations	<u>3</u>	<u>0</u>	<u>3</u>
Total		14	12	18
<b>SIXTH QUARTER</b>				
ECON 160	American Economics	3	0	3
MECH 215	Mechanical Engineering Design II	3	3	4
MECH 246	Metallurgy	3	3	4
MECH 267	Mechanics of Fluids	3	3	4
MECH 299	Mechanical Seminar	0-2	<u>0-6</u>	<u>2</u>
Total		12-14	9-15	17

## **POLICE SCIENCE**

*Degree:* Associate in Applied Science

*Length:* Six-Quarter (two-year) Program

*Purpose:* The curriculum in Police Science has been developed and is maintained in cooperation with state and local police officials. The curriculum is not designed to train for any specialty, but rather to provide a broad foundation which will prepare the student to enter any of the many fields of law enforcement. Although the curriculum is primarily designed for persons who seek full-time employment in law enforcement, several adjustments are possible to enable a student to prepare for transfer to a baccalaureate degree program in Police Science.

*Occupational Objectives:*

Commercial and Industrial Security Officer  
Local, State, and Federal Enforcement Officers  
Policeman  
Private or Government Investigator

*Admission Requirements:* In addition to the general requirements for admission to the College (as listed in the section on admissions requirements in Part II of this catalog), entry into the Associate in Applied Science degree program in Police Science requires the following:

1. A written statement from the city or county law enforcement agency having jurisdiction in the applicant's area of residence as to the applicant's record of conduct.
2. A personal interview with a representative of the Police Science Department.
3. The taking of the General Aptitude Test Battery administered by the College.
4. *Special Requirements:* Students who wish to enroll in the Police Science program with the objective of obtaining employment with law enforcement agencies are advised that the following qualifications are generally prerequisite to such employment:
  - a. Excellent physical condition, free from any physical or mental condition which might adversely affect acceptance or performance as a law enforcement officer.
  - b. Possess normal hearing and normal color vision. Eye functions must be normal. Visual acuity must not be less than 20/40 in either eye without correction.
  - c. Weight should be in proportion to height. Very few law enforcement agencies will accept male applicants who are less than 5' 8" in height.
  - d. Must be of excellent moral character. Must not have been

convicted of any crime involving moral turpitude or any felony. Must not have received an excessive number of traffic citations. Background investigation will be conducted by the employing agency to confirm the foregoing.

## POLICE SCIENCE

### Associate in Applied Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIRST QUARTER</b>				
PLCE 100	Introduction to Law Enforcement	3	0	3
BIOL 101	General Biology I (or Science elective)	3	3	4
ENGL 101	Communication Skills I*	3	0	3
PSYC 110	Applied Psychology*	3	0	3
SOCI 101	Introductory Sociology I (or Sociology elective)	3	0	3
GENL 100	Orientation	<u>1</u>	<u>1</u>	<u>1</u>
Total		16	4	17
<b>SECOND QUARTER</b>				
PLCE 111	Police Administration and Organization I	3	0	3
BIOL 102	General Biology II (or Science elective)	3	3	4
ENGL 102	Communication Skills II*	3	0	3
PSYC 116	Psychology of Personal Adjustment (or PSYC elective)	3	0	3
SOCI 102	Introductory Sociology II (or elective)	<u>3</u>	<u>0</u>	<u>3</u>
Total		15	3	16
<b>THIRD QUARTER</b>				
PLCE 112	Police Administration and Organization II	3	0	3
PLCE 160	Police Communications and Records	3	0	3
BIOL 103	General Biology III (or Science elective)	3	3	4
ENGL 136	Speech Communications*	2	2	3
SOCI 103	Introductory Sociology III			
or				
PLCE 120	Special Enforcement Problems	3	0	3
PHED 101	Health, Phys. Ed., or Recreation	<u>0</u>	<u>3</u>	<u>1</u>
Total		14	8	17
<b>FOURTH QUARTER</b>				
PLCE 126	Prevention & Control of Juvenile Delinquency	3	0	3
PLCE 130	Criminal Law	3	0	3
PLCE 244	Principles of Criminal Investigation	3	0	3
MATH	Mathematics (or elective)*	3-5	0	3-5
GOVT 281	United States Government I	3	0	3
PHED 102	Health, Phys. Ed., or Recreation	0	<u>3</u>	<u>1</u>
Total		15-17	3	16-18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIFTH QUARTER</b>				
PLCE 136	Legal Evidence	3	0	3
PLCE 187	Traffic Administration & Control (optional)*	0-3	0	0-3
PLCE 245	Advanced Criminal Investigation	3	0	3
ARTS 180	Introduction to Photography (or elective)	1	3	2
SOCI 276	Criminology	3	0	3
GOVT 282	United States Government II	3	0	3
PHED 103	Health, Phys. Ed., or Recreation	0	3	1
Total		13-16	6	15-18

<b>SIXTH QUARTER</b>				
PLCE 237	Administration of Justice (or PLCE elective)	3	0	3
PLCE 270	Industrial & Commercial Security (or elective)*	3	0	3
PLCE 299	Seminar and Project in Law Enforcement	2	0	2
ECON 160	American Economics	3	0	3
GOVT 283	United States Government III	3	0	3
SECR 110	Personal Typing (optional)	<u>0-1</u>	<u>0-3</u>	<u>0-2</u>
Total		16-17	0-3	16-18
Total Minimum Credits for a Police Science Major				97

\*Students planning to transfer to a four-year college or university should consult with their counselor to select alternate courses for their program.

## SECRETARIAL SCIENCE

*Degree:* Associate in Applied Science

*Length:* Six-Quarter (two-year) Program

*Purpose:* The Secretarial Science program is designed as a two-year series of courses leading to the Associate in Applied Science Degree. The complete sequence is composed of a balanced schedule of courses for skill development and for general education. All entering students will follow the same program unless they have been granted advanced placement in typewriting and/or shorthand.

*Occupational Objectives:* The general secretarial course is offered to those who wish to prepare for positions as stenographers or secretaries in any major field of business.

*Admission Requirements:* Satisfactory scores on appropriate sections of the American College Testing (ACT) will be required for admission to the department. This test will be administered by the Guidance Department at the College at no cost to the student. Students must be accepted in the department in order to register for shorthand classes for credit.

Students who have had some training in shorthand and typewriting may be granted advanced placement upon acceptance in the department. The student's achievement record in the prior courses will be the major basis upon which advanced standing may be granted.

Students who receive a grade below "C" in any shorthand or typewriting class will be required to repeat the course and to earn a grade of "C" or higher before registering for the next course in the sequence.

*Program Requirements:* Upon completion of the six-quarter program listed below, the student will be awarded the Associate in Applied Science Degree with a major in Secretarial Science.

## SECRETARIAL SCIENCE

### Associate in Applied Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIRST QUARTER</b>				
SECR 111	Typewriting I	1	4	3
SECR 121	Shorthand I	3	2	4
BUAD 100	Introduction to Business	3	0	3
ENGL 101	Communication Skills I	3	0	3
MATH 151	Business Mathematics I	3	0	3
PHED 101	Health, Phys. Ed., or Recreation	0	3	1
GENL 100	Orientation	1	1	1
Total		14	10	18
<b>SECOND QUARTER</b>				
SECR 112	Typewriting II	1	4	3
SECR 122	Shorthand II	3	2	4
BUAD 170	Business Organization & Management	3	0	3
ENGL 102	Communication Skills II	3	0	3
MATH 152	Business Mathematics II	3	0	3
PHED 102	Health, Phys. Ed., or Recreation	0	3	1
Total		13	9	17
<b>THIRD QUARTER</b>				
SECR 113	Typewriting III	1	4	3
SECR 123	Shorthand III	3	2	4
SECR 136	Filing and Records Management	1	2	2
	*Elective	3	0	3
BUAD 156	Office Machines	1	2	2
ENGL 136	Speech Communications	2	2	3
PHED 103	Health, Phys. Ed., or Recreation	0	3	1
Total		11	15	18
<b>FOURTH QUARTER</b>				
SECR 216	Executive Typing	1	2	2
SECR 241	Secretarial Procedure I	2	2	3
SECR 221	Shorthand Transcription I	1	4	3
GOVT 180	American Constitutional Government	3	0	3
PSYC 110	Principles of Applied Psychology	3	0	3
	Elective	-	-	4
Total				18

\*Electives from BUAD or SECR programs.



Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIFTH QUARTER</b>				
SECR 266	Machine Transcription	2	2	3
SECR 222	Shorthand Transcription II	1	4	3
SECR 242	Secretarial Procedures II	2	2	3
BUAD 241	Business Law I	3	0	3
ECON 160	American Economics	3	0	3
	Elective	=	=	3
Total				18
<b>SIXTH QUARTER</b>				
SECR 217	Typewriting Skill Building	1	2	2
SECR 223	Shorthand Transcription (General)	1	4	3
SECR 243	Secretarial Procedures III	2	2	3
BUAD 242	Business Law II	3	0	3
	Electives	=	=	7
Total				18

**LIBERAL ARTS**

*Degree:* Associate in Arts

*Length:* Six-Quarter (two-year) Program

*Purpose:* The Associate in Arts degree program in Liberal Arts is designed for persons who plan to transfer to a four-year college or university to complete a baccalaureate degree program, usually the Bachelor of Arts degree, in the liberal arts or social sciences. Students in this program may wish to major in the following fields:

- |                                |                   |
|--------------------------------|-------------------|
| Economics                      | Library Science   |
| Education                      | Literature        |
| English                        | Philosophy        |
| Foreign Language               | Pre-Law           |
| Government (Political Science) | Psychology        |
| History                        | Sociology         |
| Humanities                     | Teacher Education |
| Journalism                     |                   |

*Admission Requirements:* In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Arts degree program in Liberal Arts requires the satisfactory completion of the following high school units or equivalent as a minimum:

- |                    |                              |
|--------------------|------------------------------|
| 4 units of English | 1 unit of laboratory science |
| 2 units of algebra | 1 unit of history            |
| 1 unit of geometry |                              |

The remaining units are elective subjects, but at least two units of a

foreign language are recommended. Students who do not meet these requirements may be permitted to correct their deficiencies in the Preparatory Foundations Program before entering the Liberal Arts curriculum.

*Program Requirements:* This curriculum consists of courses in the humanities including a foreign language, natural sciences, and social sciences usually required in the first two years of a baccalaureate liberal arts curriculum. A minimum of 97 credits is required for the Liberal Arts major in the Associate in Arts degree program. *Each student is urged to acquaint himself with the requirements of the major department in the college or university to which transfer is contemplated and also to consult with the Counseling Department of the Community College in planning his program and selecting his electives.* In order to help prepare for upper division (junior class) standing at a four-year college or university, the student usually must complete a program at the community college that is comparable in length and courses to the first two years of the program at the four-year college or university. Upon completion of the six-quarter program listed below, the student will be awarded the Associate in Arts degree with a major in the Liberal Arts.

## LIBERAL ARTS

### Associate in Arts Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIRST QUARTER</b>				
ENGL 111	English Composition I	3	0	3
	Natural Science (Lab)	3	3	4
MATH 131	College Algebra and Trigonometry I	3	0	3
HIST	Amer. History or History of West. Civ	3	0	3
	Foreign Language I*	3	2	3
GENL 100	Orientation	1	1	1
	Total	15	7	17
<b>SECOND QUARTER</b>				
ENGL 112	English Composition II	3	0	3
	Natural Science (Lab)	3	3	4
MATH 132	College Algebra and Trigonometry II	3	0	3
HIST	Amer. History or History of West. Civ.	3	0	3
	Foreign Language II*	3	2	3
PHED 101	Health, Phys. Ed., or Recreation	0	3	1
	Total	15	8	17

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>THIRD QUARTER</b>				
ENGL 113	English Composition III	3	0	3
	Natural Science (Lab)	3	3	4
MATH 113	College Algebra and Trigonometry III	3	0	3
HIST	Amer. History or History of West. Civ.	3	0	3
	Foreign Language III*	3	2	3
PHED 102	Health, Phys. Ed., or Recreation	0	3	1
	Total	15	8	17
<b>FOURTH QUARTER</b>				
ENGL	English and/or American Literature	3	0	3
	Foreign Language IV*	3	2	3
GOVT	Government**	3-5	0	3-5
PHED 103	Health, Phys. Ed., or Recreation	0	3	1
	Humanities Elective	-	-	3-5
	Other Elective	-	-	0-3
	Total			15-18
<b>FIFTH QUARTER</b>				
ENGL	English and/or American Literature	3	0	3
	Foreign Language V*	3	2	3
PSYC	Psychology or Human Relations**	3-5	0	3-5
	Humanities or Social Science Elective	-	-	3-5
	Other Elective	-	-	0-3
	Total			14-18
<b>SIXTH QUARTER</b>				
ENGL	English and/or American Literature	3	0	3
	Foreign Language VI*	3	2	3
ECON	Economics**	3-5	0	3-5
	Humanities or Social Science or Speech Elec.	-	-	3-5
	Other Elective	-	-	0-3
	Total			14-17
	Total Minimum Credits for a Liberal Arts Major			97

\*Students who have satisfactorily completed two years of foreign language in high school may petition for advanced placement into the second year of the foreign language at the College.

\*\*In addition to the general education requirements of the Community College, students may be advised to take a full year of a sophomore level social science course if required by the four-year college or university to which they plan to transfer.

## BUSINESS ADMINISTRATION

*Degree:* Associate in Science

*Length:* Six-Quarter (two-year) Program

*Purpose:* With the rapid development in business and industry in Virginia, there is a great demand for qualified personnel in business administration to help provide leadership for this economic growth.

The Associate in Science degree program in Business Administration is designed for persons who plan to transfer to a four-year college or university to complete a baccalaureate degree program in business administration.

*Admission Requirements:* In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Science degree program in Business Administration requires the satisfactory completion of the following high school units or equivalent as a minimum:

- 4 units of English
- 2 units of algebra
- 1 unit of geometry
- 1 unit of laboratory science
- 1 unit of social studies

Students who do not meet these requirements may be permitted to correct their deficiencies in the Preparatory Foundations Program before entering the Business Administration curriculum.

*Program Requirements:* The modern business world demands that its staff be knowledgeable in fields over and beyond the every-day business technology. Thus, this curriculum requires courses in the humanities, natural science, and social sciences in addition to the principles of economics and principles of accounting usually required in the first two years of a baccalaureate business administration curriculum. *Each student is urged to acquaint himself with the requirements of the major department in the college or university to which transfer is contemplated and also to consult with the Counseling Department of the Community College in planning his program and selecting his electives.* In order to help prepare for upper division (junior class) standing at a four-year college or university, the student usually must complete a program at the community college that is comparable in length and courses to the first two years of the program at the four-year college or university. Upon completion of the six-quarter program listed on the next pages, the student will be awarded the Associate in Science degree with a major in Business Administration.

**BUSINESS ADMINISTRATION****Associate in Science Degree Program**

<b>Course Number</b>	<b>Course Title</b>	<b>Lecture Hours</b>	<b>Lab Hours</b>	<b>Course Credits</b>
<b>FIRST QUARTER</b>				
ENGL 111	English Composition I	3	0	3
	Natural Science (Lab)	3	3	4
MATH 131	College Algebra and Trigonometry I	3	0	3
HIST	Amer. History or History of West. Civ.	3	0	3
GENL 100	Orientation	1	1	1
	Elective	—	—	<u>2-4</u>
Total				16-18
<b>SECOND QUARTER</b>				
ENGL 112	English Composition II	3	0	3
	Natural Science (Lab)	3	3	4
MATH 132	College Algebra and Trigonometry II	3	0	3
HIST	Amer. History or History of West. Civ.	3	0	3
PHED 101	Health, Phys. Ed., or Recreation	0	3	1
	Elective	—	—	<u>2-4</u>
Total				16-18
<b>THIRD QUARTER</b>				
ENGL 113	English Composition II	3	0	3
	Natural Science (Lab)	3	3	4
MATH 133	College Algebra and Trigonometry III	3	0	3
HIST	Amer. History or History of West. Civ.	3	0	3
PHED 102	Health, Phys. Ed., or Recreation	0	3	1
	Elective	—	—	<u>2-3</u>
Total				16-18
<b>FOURTH QUARTER</b>				
ENGL	English and/or American Literature	3	0	3
ECON 211	Principles of Economics I	3	0	3
BUAD 211	Principles of Accounting I	3	2	4
PSYC	Psychology or Human Relations*	3-5	0	3-5
PHED 103	Health, Phys. Ed., or Recreation	0	3	1
	Elective	—	—	<u>0-3</u>
Total				16-18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIFTH QUARTER</b>				
ENGL	English and/or American Literature	3	0	3
ECON 212	Principles of Economics II	3	0	3
BUAD 212	Principles of Accounting II	3	2	4
GOVT	Government*	3-5	0	3-5
	Elective	—	—	<u>0-3</u>
Total				15-18

<b>SIXTH QUARTER</b>				
ENGL	Literature or Speech	—	—	3-5
BUAD 213	Principles of Accounting III	3	2	4
ECON 213	Principles of Economics III	3	0	3
	Humanities Elective	—	—	3-5
	Other Elective	—	—	<u>0-4</u>
Total				15-18

Total Minimum Credits for a Business Administration Major 97

\*In addition to the general education requirements of the Community College, students may be advised to take a full year of a sophomore level social science course if required by the four-year college or university to which they plan to transfer.

## PRE-ENGINEERING

*Degree:* Associate in Science

*Length:* Six-Quarter (two-year) Program

*Purpose:* The demand for technically trained people is increasing rapidly in Virginia as well as throughout the world. The engineer is a most important member of the technical team, which includes the scientist, engineer, technician, and skilled craftsman. Opportunities are unlimited for men and women in the field of engineering. Science is so diversified now that one may enter almost any specialization and find employment. The preparation for the engineering profession is based on a vigorous program, especially in mathematics and science.

The Associate in Science degree program in Pre-Engineering is designed for persons who plan to transfer to a four-year college or university to complete a baccalaureate degree program in one of the following engineering fields:

Aerospace Engineering	Engineering Mechanics
Agricultural Engineering	Industrial Engineering
Architectural Engineering	Mechanical Engineering
Ceramic Engineering	Metallurgical Engineering
Chemical Engineering	Mining Engineering
Civil Engineering	Nuclear Engineering
Electrical Engineering	

*Admission Requirements:* In addition to the admission requirements

established for the College (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Science degree curriculum in Pre-Engineering requires the satisfactory completion of the following high school units or equivalent as a minimum:

- 4 units of English
- 4 units of mathematics (2 units of algebra, 1 unit of plane geometry, 1 unit of advanced math or trigonometry and solid geometry)
- 1 unit of a laboratory science
- 1 unit of social studies

Students who do not have an adequate foundation in English grammar and composition to enroll in ENGL 112 (the beginning English course for pre-engineering majors), as indicated by high school grades and test scores, may first have to complete ENGL 111. Students who do not meet the requirements listed above may be permitted to correct their deficiencies in the Preparatory Foundations Program before entering the Pre-Engineering curriculum.

*Program Requirements:* This program includes the English and humanities, mathematics, science, social science, and introductory engineering courses usually required in the first two years of a baccalaureate engineering curriculum. *Each student is urged to acquaint himself with the requirements of the major department in the college or university to which he expects to transfer and also to consult with the Counseling Department of the community college in planning his program and selecting his electives.* In order to help prepare for upper division (junior class) standing at a four-year college or university, the student usually must complete a program at the community college that is comparable in length and courses to the first two years of the program at the four-year college or university. Upon completion of the six-quarter curriculum listed below, the student will be awarded the Associate in Science degree with a major in Pre-Engineering.

## PRE-ENGINEERING

### Associate in Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIRST QUARTER</b>				
CHEM 111	General Inorganic Chemistry I	3	3	4
MATH 141	Mathematics Analysis I	5	0	5
ENGR 121	Engineering Graphics I	1	3	2
ENGR 100	Introduction to Engineering	0	3	1
ENGL 112	English Composition II*	3	0	3
PHED 101	Health, Phys. Ed., or Recreation	0	3	1
GENL 100	Orientation	1	1	1
Total		13	13	17

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>SECOND QUARTER</b>				
CHEM 112	General Inorganic Chemistry II	3	3	4
MATH 142	Mathematical Analysis II	5	0	5
ENGR 122	Engineering Graphics II	1	3	2
HIST	History of West. Civ. or History Elective	3	0	3
ENGL 113	English Composition III	3	0	3
PHED 102	Health, Phys. Ed., or Recreation	<u>0</u>	<u>3</u>	<u>1</u>
Total		15	9	18
<b>THIRD QUARTER</b>				
CHEM 113	General Inorganic Chemistry III	3	3	4
MATH 143	Mathematical Analysis III	5	0	5
ENGR 123	Descriptive Geometry	2	3	3
ECON	Economics**	3-5	0	3-5
HIST	History of West. Civ. (Optional)	0-3	<u>0</u>	<u>0-3</u>
Total		15-16	6	17-18
<b>FOURTH QUARTER</b>				
PHYS 221	College Physics I	3	3	4
MATH 241	Advanced Mathematical Analysis I	4	0	4
ENGR 251	Statics	4	0	4
ECON	Economics (or Elective)	3	0	3
ENGL	English Literature	<u>3</u>	<u>0</u>	<u>3</u>
Total		17	3	18
<b>FIFTH QUARTER</b>				
PHYS 222	College Physics II	3	3	4
MATH 242	Advanced Mathematical Analysis II	4	0	4
ENGR 252	Dynamics	5	0	5
GOVT	Government**	3	0	3
ENGL 262	English Literature (Optional)	<u>0-3</u>	<u>0</u>	<u>0-3</u>
Total		15-18	3	16-18
<b>SIXTH QUARTER</b>				
PHYS 223	College Physics III	3	3	4
MATH 243	Advanced Mathematical Analysis III	4	0	4
ENGR 253	Mechanics of Solids	4	0	4
PSYC	Psychology or Human Relations**	3	0	3
PHED 103	Health, Phys. Ed., or Recreation	0	3	1
ENGL 251	American Literature (Optional)	<u>0-3</u>	<u>0</u>	<u>0-3</u>
Total		14-17	6	16-18
Total Minimum Credits of Pre-Engineering Major				106

\*Entering freshmen without adequate foundation in English grammar and composition to enroll in ENGL 112 as indicated by high school grades and test scores may first have to take ENGL 111.

\*\*In addition to the general education requirements of the Community College, students may be advised to take a full year of a sophomore level social science course if required by the four-year college or university to which they plan to transfer.



## PRE-TEACHER EDUCATION

*Degree:* Associate in Science

*Length:* Six-Quarter (two-year) Program

*Purpose:* With the rapid development and emphasis on education in Virginia there is a great demand for qualified teachers and other educational specialists to help provide leadership for the schools.

The Associate in Science degree program in Pre-Teacher Education is designed for persons who plan to transfer to a four-year college or university to complete a baccalaureate degree program in Teacher Education.

*Admission Requirements:* In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Science degree program in Pre-Teacher Education requires the satisfactory completion of the following high school units; or equivalent, as a minimum:

- 4 units of English
- 2 units of algebra
- 1 unit of geometry
- 1 unit of laboratory science
- 1 unit of social studies

Students who do not meet these requirements may be permitted to correct their deficiencies in the Preparatory Foundations Program before entering the Pre-Teacher Education curriculum.

*Program Requirements:* The modern education world demands that its teachers and staff be knowledgeable both in the subjects they plan to teach and in general education. Thus, this curriculum requires courses in the humanities, natural sciences, and mathematics, social sciences, and health and physical education in addition to general psychology usually required in the first two years of a baccalaureate teacher education curriculum. The Pre-Teacher Education curriculum is designed to lead the student toward meeting the state teacher certification requirements for a Collegiate Professional Certificate. Eligible students may also qualify for the State Teachers' Scholarships. *Each student is urged to acquaint himself with the requirements of the major department in the college or university to which transfer is contemplated and also, to consult with the Counseling Department of the Community College in planning his program and selecting his electives.* In order to help prepare for upper division (junior class) standing at a four-year college or university, the student usually must complete a program at the community college that is comparable in length and courses to the first two years of the program at the four-year college or university. Upon completion of the six-quarter program listed on the next page, the student will be awarded the Associate in Science degree with a major in Pre-Teacher Education.

**PRE-TEACHER EDUCATION****Associate in Science Degree Program**

<b>Course Number</b>	<b>Course Title</b>	<b>Lecture Hours</b>	<b>Lab Hours</b>	<b>Course Credits</b>
<b>FIRST QUARTER</b>				
ENGL 111	English Composition I	3	0	3
	Natural Science (Lab)	3	3	4
MATH 131	College Algebra and Trigonometry I	3	0	3
HIST 111	American History I	3	0	3
GENL 100	Orientation	1	1	1
	Elective	-	-	<u>3</u>
	<b>Total</b>			17
<b>SECOND QUARTER</b>				
ENGL 112	English Composition II	3	0	3
	Natural Science (Lab)	3	3	4
MATH 132	College Algebra and Trigonometry II	3	0	3
HIST 112	American History II	3	0	3
PHED 101	Health, Phys. Ed., or Recreation	-	-	1
	Elective	-	-	<u>3</u>
	<b>Total</b>			17
<b>THIRD QUARTER</b>				
ENGL 113	English Composition III	3	0	3
	Natural Science (Lab)	3	3	4
MATH 133	College Algebra and Trigonometry III	3	0	3
HIST 113	American History III	3	0	3
PHED 102	Health, Phys. Ed., or Recreation	-	-	1
	Elective	-	-	<u>3</u>
	<b>Total</b>			17
<b>FOURTH QUARTER</b>				
ENGL 261	English Literature	3	0	3
PSYC 201	General Psychology I	3	0	3
GOVT	Government*	3-5	0	3-5
	Humanities Elective (Art or Music)	-	-	3-5
PHED 103	Health, Phys. Ed., or Recreation	-	-	1
	Other Elective	-	-	<u>0-3</u>
	<b>Total</b>			15-18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIFTH QUARTER</b>				
ENGL 262	English Literature	3	0	3
PSYC 202	General Psychology II	3	0	3
ECON	Economics*	3-5	0	3-5
PHED	Health Education (or Elective)	-	-	3-5
	Elective	-	-	<u>0-3</u>
Total				14-18
<b>SIXTH QUARTER</b>				
ENGL 251	American Literature (or Elective)	3	0	3
ENGL 230	Principles of Public Speaking (or Elective)	4	2	5
PSYC 203	General Psychology III (or Elective)	3	0	3
SOC	Sociology (or Elective)	3	0	3
	Other Elective	-	-	<u>0-3</u>
Total				15-17
Total Minimum Credits for a Pre-Teacher Education Major				97

\*In addition to the general education requirements of the Community College, students may be advised to take a full year of a sophomore level social science course if required by the four-year college or university to which they plan to transfer.

## SCIENCE

*Degree:* Associate in Science

*Length:* Six-Quarter (two-year) Program

*Purpose:* With the tremendous emphasis on scientific discoveries and technological developments in today's society, there is a great demand for scientists and scientifically oriented persons in business, government, industry, and the professions.

The Associate in Science degree program with a major in Science is designed for persons who are interested in a pre-professional or scientific program and who plan to transfer to a four-year college or university to complete a baccalaureate degree program with a major in one of the following fields:

Agriculture	Forestry	Nursing
Biology	Home Economics	Pharmacy
Chemistry	Mathematics	Physics
Dentistry	Medicine	

*Admission Requirements:* In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), entry into the Associate in Science degree program with a major in science requires the satisfactory completion of the following high school units or equivalent as a minimum:

4 units of English  
2 units of algebra  
1 unit of geometry

1 unit of laboratory science  
1 unit of social studies

Students who do not meet these requirements may be permitted to correct their deficiencies in the Preparatory Foundations Program before entering this science curriculum.

*Program Requirements:* Although the major emphasis in this curriculum is on mathematics, the biological sciences, and the physical sciences, the curriculum also includes courses in the humanities and social sciences. Numerous electives are provided so that the student can select the appropriate courses for his pre-professional or scientific program as required in the first two years of the four-year college or university. *Each student is urged to acquaint himself with the requirements of the major department in the college or university to which transfer is contemplated and also to consult with the Counseling Department of the Community College in planning his program and selecting his electives.* In order to help prepare for upper division (junior class) standing at a four-year college or university, the student usually must complete a program at the community college that is comparable in length and courses to the first two years of the program at the four-year college or university. Upon completion of the six-quarter program listed below, the student will be awarded the Associate in Science degree with a major in Science.

## SCIENCE

### Associate in Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIRST QUARTER</b>				
ENGL 111	English Composition I	3	0	3
	Natural Science (Lab)	3	3	4
MATH 131 or 141	Mathematics	3-5	0	3-5
GENL 100	Orientation	1	1	1
PHED 101	Health, Phys. Ed., or Recreation	-	-	1
	Electives	=	=	<u>3-6</u>
Total				15-18
<b>SECOND QUARTER</b>				
ENGL 112	English Composition II	3	0	3
	Natural Science (Lab)	3	3	4
MATH 132 or 142	Mathematics	3-5	0	3-5
HIST	History Elective	3	0	3
PHED 102	Health, Phys. Ed., or Recreation	-	-	1
	Other Elective	=	=	<u>3-4</u>
Total				17-18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>THIRD QUARTER</b>				
ENGL 113	English Composition III	3	0	3
	Natural Science (Lab)	3	3	4
MATH 133 or 143	Mathematics	3-5	0	3-5
PSYC 201 or 128	Psychology or Human Relations*	3-5	0	3-5
	Electives	=	=	<u>3-5</u>
	Total			16-18
<b>FOURTH QUARTER</b>				
ENGL 261	English Literature	3	0	3
	Advanced Natural Science (Lab)	3	3	4
MATH	Advanced Mathematics (or Elective)	-	-	3-4
GOVT 281 or 180	Government*	3-5	0	3-5
PHED 103	Health, Phys. Ed., or Recreation	-	-	1
	Other Elective	=	=	<u>0-3</u>
	Total			14-18
<b>FIFTH QUARTER</b>				
ENGL 262	Literature (or Elective)	3	0	3
	Advanced Natural Science (Lab)	3	3	4
MATH	Advanced Mathematics (or Elective)	-	-	3-4
	Humanities Elective	-	-	3-5
	Other Elective	=	=	<u>0-4</u>
	Total			14-18
<b>SIXTH QUARTER</b>				
ENGL 251	Literature or Speech	3-4	0-2	3-5
	Advanced Natural Science (Lab)	3	3	4
MATH	Advanced Mathematics (or Elective)	-	-	3-4
ECON 211 or 160	Economics*	3-5	0	3-5
	Other Electives	=	=	<u>0-4</u>
	Total			14-18
	Total Minimum Credits for a Science Major			97

\*In addition to the general education requirements of the community colleges, students may be advised to take a full year of a sophomore level social science course if required by the four-year college or university to which they plan to transfer.

## AUTOMOTIVE TECHNOLOGY

*Degree: Diploma*

*Length: Six-Quarter (two-year) Program*

*Purpose: Complexity in automotive vehicles increases each year because of scientific discovery and new engineering. There is a great*

demand for qualified automotive technicians and diagnosticians to help service the growing number of automobiles in our society.

The Automotive Technology curriculum is designed to advance the individual's mechanical knowledge of the principles of operation and theory of modern automobiles, to develop his mechanical skills to a point where he has attained a high degree of proficiency and to develop his interest in an automotive industry career. The curriculum is designed primarily for persons who seek full-time employment in the automotive field immediately upon completion of the community college program. For one to advance successfully in this program of study, a thorough understanding of automobile basic operating principles, repair techniques, and repair skills is required. The curriculum is designed to provide a two-phase approach to automotive career development. The first develops his knowledge of the operating principles of automobile components, repair techniques, and operation of an automotive repair business. The second phase develops his ability to intelligently and efficiently analyze automobile defects, repair and adjustment needs, along with the estimation of customer cost for the repairs and adjustments.

*Occupational Objectives:*

- Automotive Diagnostician
- Automotive Technician
- Auto Parts Sales and Service
- Customer Service Representative
- Quality Control Technician
- Repair Service Estimator
- Repair Service Salesman
- Repair Service Writer
- Repair Technician
- Service Manager
- Tune-Up Specialist

*Admission Requirements:* In addition to the admission requirements established for the College (as listed in the section on admission requirements in Part II of this catalog), a good understanding of mathematics and science is needed. The Counseling Office may administer tests to determine if the applicant has sufficient background in these areas to be successful in the program. Students who do not meet these minimum requirements may correct their deficiencies in the Preparatory Foundations Program.

*Program Requirements:* Approximately one-half of the curriculum will include courses in automotive technology with the remaining courses in related subjects, general education, and electives. Instruction will include both the theoretical concepts and practical applications needed for future success in Automotive Technology. Each student is advised to consult with his faculty advisor and the Counseling

Department of the College in planning his program. Students completing the six-quarter planned program listed here will be awarded a Diploma in Automotive Technology.

## AUTOMOTIVE TECHNOLOGY

### Two-Year Diploma Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIRST QUARTER</b>				
AUTO 111	Automotive Engines I	2	6	4
AUTO 121	Automotive Fuel Systems I	2	3	3
DRFT 071	Basic Blueprint Reading I	1	3	2
ENGL 101	Communication Skills I	3	0	3
GENL 100	Orientation	1	1	1
MATH 021	Elementary Technical Mathematics	4	0	4
PHED 101	Health, Phys. Ed., or Recreation	<u>0</u>	<u>3</u>	<u>1</u>
	Total	13	16	18
<b>SECOND QUARTER</b>				
AUTO 112	Automotive Engines II	2	6	4
AUTO 122	Automotive Fuel Systems II	2	3	3
ENGL 102	Communication Skills II	3	0	3
MATH 022	Elementary Technical Mathematics II	4	0	4
PHYS 011	Introductory Physics I	<u>3</u>	<u>3</u>	<u>4</u>
	Total	14	12	18
<b>THIRD QUARTER</b>				
AUTO 113	Automotive Engines III	2	6	4
AUTO 136	Automotive Lubrication & Cooling Systems	2	3	3
ENGL 136	Speech Communications	2	2	3
MATH 023	Elementary Technical Mathematics III	4	0	4
PHYS 012	Introductory Physics II	<u>3</u>	<u>3</u>	<u>4</u>
	Total	13	14	18
<b>FOURTH QUARTER</b>				
AUTO 241	Automotive Electrical Systems I	2	3	3
AUTO 251	Power Train I	2	6	4
PSYC 128	Human Relations	3	0	3
PHYS 013	Introductory Physics III	3	3	4
MECH 020	Machine Shop Practice	0	6	2
AUTO 261	Body Repair	<u>0</u>	<u>6</u>	<u>2</u>
	Total	10	24	18

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIFTH QUARTER</b>				
AUTO 242	Automotive Electrical Systems II	2	3	3
AUTO 252	Power Train II	2	6	4
ECON 160	American Economics	3	0	3
WELD 026	Introduction to Welding	0	3	1
AUTO 238	Automotive Air Conditioning	2	3	3
AUTO 286	Service Procedure & Tune-Up	2	3	3
PHED 102	Health, Phys. Ed., or Recreation	0	3	1
Total		11	21	18
<b>SIXTH QUARTER</b>				
AUTO 243	Automotive Electrical Systems III	2	3	3
AUTO 266	Automotive Suspension & Braking Systems	2	3	3
AUTO 271	Shop Management & Customer Relations	3	0	3
AUTO 299	Seminar & Project in Automotive Technology	2	0	2
GOVT 180	American Constitutional Government	3	0	3
AUTO 287	Service Procedures	2	3	3
PHED 103	Health, Phys. Ed., or Recreation	0	3	1
Total		14	12	18

## MECHANICAL DRAFTING

*Degree:* Certificate in Mechanical Drafting

*Length:* Three-Quarter (one-year) Program

*Purpose:* With the rapid growth of industry in Virginia, and the steady demand for qualified draftsmen in the local area, there is a need for training personnel to meet these requirements. The curriculum in Mechanical Drafting is designed to train persons for full-time employment immediately upon completion of the community college curriculum offering.

*Admission Requirements:* Admission to the program, in addition to the requirements for general admission to the College, require that the student show satisfactory aptitude for drawing as measured by appropriate tests administered by the College Counseling Department.

*Program Requirements:* The Mechanical Drafting Program is designed to prepare students to work as mechanical draftsmen and to provide the student with an introduction to the basic problems associated with design and manufacturing of mechanical devices. The curriculum includes basic courses in the humanities (English, government, and psychology) to assist the student in social and business communications and to prepare the student to meet the obligations of the citizen in our democratic society.

Students successfully completing the three-quarter sequence in Mechanical Drafting receive a Certificate of Completion. Job op-



portunities for mechanical draftsmen exist in many areas, primarily in the manufacturing industries.

### MECHANICAL DRAFTING One-Year Certificate Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
<b>FIRST QUARTER</b>				
DRFT 131	Mechanical Drafting I	2	12	5
ENGL 101	Communication Skills I	3	0	3
MATH 021	Elementary Technical Mathematics I	3	0	3
INDT 141	Methods of Manufacture I	2	3	3
GENL 100	Orientation	1	1	1
ECON 160	American Economics	<u>3</u>	<u>0</u>	<u>3</u>
Total		14	16	18
<b>SECOND QUARTER</b>				
DRFT 132	Mechanical Drafting II	2	12	5
ENGL 102	Communication Skills II	3	0	3
MATH 022	Elementary Technical Mathematics II	3	0	3
INDT 142	Methods of Manufacture II	2	3	3
PSYC 128	Human Relations	<u>3</u>	<u>0</u>	<u>3</u>
Total		13	16	17
<b>THIRD QUARTER</b>				
DRFT 133	Mechanical Drafting III	2	12	5
ENGL 103	Speech Communications	3	0	3
GOVT 180	American Constitutional Government	3	0	3
MATH 023	Elementary Technical Mathematics III	3	0	3
	*Technical Elective	<u>3</u>	<u>3</u>	<u>4</u>
Total		14	15	18

\*Electives must be approved by the Department Chairman.

### PREPARATORY (FOUNDATIONS) PROGRAM

Foundations and developmental programs are offered to help prepare individuals for admission to the occupational-technical program and to the university parallel-college transfer program in the community college. These programs are designed to help the individual develop the basic skills and understandings necessary to succeed in other programs of the community colleges.

The foundations program provides an opportunity to obtain needed knowledges and skills for an individual who is not fully prepared for entry into an associate degree program because he has previously not had an opportunity to complete an appropriate educational course or program or because he has low achievement in his previous educa-

tional programs. A student is placed in the foundations program after a close analysis of his high school transcript, ACT scores, and other data available on his achievement level.

Through the use of specialized teaching methods and modern equipment with an extensive concentration upon laboratory experiences, the student may, through concentrated effort in the areas of his weakness, progress at his own rate. The student will be tested frequently for the purpose of showing him the progress he is making.

The student may use either of two approaches to improve his knowledges and skills in the foundations program. In one approach, he may enroll in the regular foundations courses scheduled each quarter at the community college. In the other approach the student may utilize the materials and equipment in the Learning Laboratory for individual study of appropriate units or course materials in the areas of his deficiencies. Personnel in the Learning Laboratory or other faculty members of the College would be available to provide individualized assistance for the student. Progressing at his own rate, the student may complete the unit of study at any time that he demonstrates sufficient mastery of the subject to meet the minimum requirements for the unit or course.

A student in the foundations program may be taking all of his work at the foundation level or he may be taking some associate degree level courses for which he is qualified in addition to one or more foundations courses. Many of the foundations courses will provide credit applicable to the requirements of a diploma or certificate program. In addition if the student takes any associate degree courses, the credit earned in these courses may be transferred to an associate degree curriculum when the student is admitted to the associate degree curriculum and if the courses are applicable to the curriculum.

The student is urged to consult with the Counseling Department of the Community College in planning his program and selecting his courses.

### **PREPARATORY (FOUNDATIONS) PROGRAM**

A typical schedule in the Developmental Program may be planned with the Counseling Department, depending on individual needs, from the following courses:

1. Orientation:  
    GENL 100 (1 cr.)
2. Science:  
    CHEM 006—Basic Chemistry (4 cr.)  
    BIOL 006—Basic Biology (4 cr.)  
    PHYS 001, 002, 003—Basic Physics (12 cr.)

**4. Language:**

- ENGL 040—Reading Improvement (3 cr.)
- ENGL 041-042—Reading Improvement (6 cr.)
- ENGL 139—Oral Communication (3 cr.)

**4. Mathematics:**

- MATH 011-012-013—Elements of Mathematics (9 cr.)
- MATH 031-032—Basic Algebra (10 cr.)
- MATH 036—Basic Plane Geometry (5 cr.)
- MATH 037 or 038—Basic Geometry & Trigonometry (5 cr.)
- MATH 039—Review of Algebra and Trigonometry (5 cr.)

Students may register for other courses for which prerequisites have been met.

Because of the laboratory experience required in the Developmental Program a student should not register for more than 12-14 credits each quarter.

The above courses are not counted on any degree program.

## DESCRIPTION OF COURSES

### Course Numbers

Courses numbered 000-099 are freshman level courses for the preparatory foundations program and for the occupational programs. The credits earned in these courses are applicable toward diploma and certificate programs but are not applicable toward an associate degree.

Courses numbered 100-199 are freshman level courses applicable toward an associate degree.

Courses numbered 200-299 are sophomore level courses applicable toward an associate degree.

### Course Credits

The credits for each course is indicated after the title in the course description. One credit is equivalent to one collegiate quarter hour credit or two-thirds of a collegiate semester hour credit.

### Course Hours

The number of lecture hours in class each week (including lecture, seminar, and discussion hours) and/or the number of laboratory hours in class each week (including laboratory, shop, supervised practice, and cooperative work experiences) are indicated for each course in the course description. The number of lecture and laboratory hours in class each week are also called "contact" hours because it is time spent under the direct supervision of a faculty member. In addition to the lecture and laboratory hours in class each week as listed in the course description each student also must spend some time on out-of-class assignments under his own direction. Usually each credit per course requires an average of three hours of in-class and out-of class work each week.

### Prerequisites

If any prerequisites are required before enrolling in a course, these prerequisites will be identified in the course description. Courses in special sequences (usually identified by the numerals I-II-III) require that prior courses or their equivalent be completed before enrolling in the advanced courses in the sequence. When corequisites are required for a course, usually the corequisites must be taken at the same time. The prerequisites or their equivalent must be completed satisfactorily before enrolling in a course unless special permission is obtained from the Dean and the instructor of the course.

### Notes

Mathematics—The four-quarter sequence of mathematics must be completed before entering the second year (4th quarter) of the program. MATH 121 and MATH 221 will be offered each summer in order to allow students to meet this requirement by either taking MATH 121 before the first fall quarter or by taking MATH 121, 122, 123 during the regular sessions and MATH 221 during the summer between the first and second years.

**Technical Options—Electrical**

- A. Communications Electronics—ELEC 241, 242, 243
- B. Industrial Electronics—ELEC 211, 212, 213

**Technical Options—Mechanical**

- A. Mechanical
  - ELEC 214, 215—Electricity
  - MECH 264—Thermodynamics
  - MECH 267—Mechanics (Fluid)
- B. Design
  - ELEC 214—Electricity
  - DRFT 268—Electrical and Pipe Drafting
  - DRFT 266—Structural Design
  - MECH 267—Mechanics (Fluid)

After an option is selected the sequence must be completed to meet graduation requirements.

The Electives may be selected from a list approved by the Department Chairman.

**ARTS AND CRAFTS**

**ARTS 101-102-103 GENERAL ART I-II-III (3 cr.) (3 cr.) (3 cr.)**—A general course for the student without previous training in art, designed to give a broad background for understanding works of art in relation to the times and the media in which they were produced. Studio exercises will be in drawing, painting, sculpture, graphic arts, with an introduction to the major media used in these fields. Lecture 2 hours, Laboratory 3 hours, Total 5 hours per week.

**ARTS 104-105-106 INTRODUCTION TO THE ARTS I-II-III (3 cr.) (3 cr.) (3 cr.)**—A general study and survey of the arts which parallels the student's studio classes. Special emphasis is placed on the arts of painting, sculpture, and architecture. Form and content are studied from the historical, sociological, and philosophical points of view. Lectures 3 hours per week.

**ARTS 111-112-113 HISTORY AND APPRECIATION OF ART I-II-III (3 cr.) (3 cr.) (3 cr.)**—The history and interpretation of architecture, sculpture and painting. The course begins with prehistoric art and follows the main stream of Western civilization to the present. Lectures 3 hours per week.

**ARTS 121-122-123 THEORY AND PRACTICE OF DRAWING I-II-III (3 cr.) (3 cr.) (3 cr.)**—Representation and non-representational drawing in charcoal, wash, pencil, and varied combinations of media. Lecture 1 hour, Laboratory 5 hours, Total 6 hours per week.

**ARTS 126 FREE-HAND SKETCHING (2 cr.)**—Basic principles and practice in freehand sketching. Laboratory 6 hours per week.

**ARTS 166 FUNDAMENTALS OF LETTERING (3 cr.)**—Calligraphy as an introduction to script and the constructed letter as used in graphic layout and design. Lectures 1 hour, Laboratory 6 hours, Total 7 hours per week.

**ARTS 171-172-173 TYPOGRAPHY I-II-III (3 cr.) (3 cr.) (3 cr.)**—The visual design of type in relation to photography, printmaking, and other printing processes. Includes identification and specification of type, copy casting, and proofing in the print shop. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

**ARTS 180 INTRODUCTION TO PHOTOGRAPHY (2 cr.)**—An introduction to the basic principles of photography with laboratory work related to the student's major field of interest. Lectures 1 hour, Laboratory 3 hours, Total 4 hours per week.

**ARTS 187 COLOR PHOTOGRAPHY (2 cr.)**—Introduction to color photography, which includes general color theory, developing color slide film and color printing.

**ARTS 221-222-223 ADVANCED DRAWING I-II-III (2 cr.) (2 cr.) (2 cr.)**—The purpose of this course is to analyze the structure and forms of the environment (nature and human) so that they become memorized like language. This frees the student's interpretation for creative graphic illustration. Laboratory 6 hours per week.

**ARTS 231-232-233 THEORY AND PRACTICE OF PAINTING I-II-III (3 cr.) (3 cr.) (3 cr.)**—Prerequisite ARTS 103 or 123. Abstract and representational painting in watercolor, oil, and tempera with emphasis on design, color composition and value. Lecture 1 hour, Laboratory 5 hours, Total 6 hours per week.

**ARTS 261-262-263 ADVERTISING DESIGN I-II-III (3 cr.) (3 cr.) (3 cr.)**—A study of the principles of optical communications as applied to advertising design in newspapers, magazines, direct mail advertising, house organs, etc. Analysis is made of the influences on layout by contemporary art. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

**ARTS 271-272-273 GRAPHIC TECHNIQUES I-II-III (3 cr.) (3 cr.) (3 cr.)**—The course is designed to familiarize the student with the use of drawing instruments and materials and to introduce him to engraving processes and the mechanics of reproduction for printing. Lecture 1 hour, Laboratory 6 hours, Total 7 hours per week.

**ARTS 281-282-283 PHOTOGRAPHY WORKSHOP I-II-III (1 cr.) (1 cr.) (1 cr.)**—Practical work in the photography lab, covering all phases of photography work that are pertinent to graphic arts. Laboratory 3 hours per week.

**ARTS 299 SEMINAR AND PROJECT IN ART (2 cr.)**—A selection and completion of an individual project related to the student's occupational objective and designed to combine theoretical concepts with practical applications by cooperative arrangements with industry or commercial artists. Also includes discussions of professional topics in general and a study of approaches to selection and pursuit of employment and career opportunities in commercial art.

## **ARCHITECTURAL TECHNOLOGY**

**ARCH 100 INTRODUCTION TO ARCHITECTURE (3 cr.)**—An intensive course outlining the history and impact of architecture. Emphasis will be placed on the dynamics and social aspects of architecture and society. Lectures 3 hours per week.

**ARCH 114 ARCHITECTURAL DRAFTING I (2 cr.)**—An introductory study of the principles and methods of architectural graphics. This subject equips the student with the basic knowledge of the purpose and methods of translating the materials of building construction into graphic presentation. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

**ARCH 115 ARCHITECTURAL DRAFTING II (2 cr.)**—Prerequisite ARCH 114. Specific emphasis in developing the student's capabilities in planning, organization, and graphical presentation of building plans, elevations, sections, and details, and the introductory study of reading architectural plans. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

**ARCH 204-205 HISTORY OF ARCHITECTURE I-II (3 cr.) (3 cr.)**—Prerequisite ARCH 113 or ARCH 115. A study of the history of architecture from ancient times to the present but with emphasis on the designs and forms of the twentieth century developments. Lectures 3 hours per week.

**ARCH 221 ARCHITECTURAL DESIGN I (4 cr.)**—Prerequisite ARCH 115. Specific emphasis on masonry and masonry veneer construction as they relate to wood and steel framing. Lectures 2 hours, Laboratory 6 hours, Total 8 hours per week.

**ARCH 222 ARCHITECTURAL DESIGN II (4 cr.)**—Prerequisite ARCH 221. Specific emphasis in the development of the steel framed structure using both

bearing and curtain-type enclosing walls. Lectures 2 hours, Laboratory 6 hours, Total 8 hours per week.

ARCH 223 ARCHITECTURAL DESIGN III (4 cr.)—Prerequisite ARCH 222. Specific emphasis on the development of the concrete framed structure using both bearings and curtain-type enclosing walls. Lectures 2 hours, Laboratory 6 hours, Total 8 hours per week.

ARCH 226 ART AND ARCHITECTURE (3 cr.)—A course designed to emphasize architecture as an art form, emphasis will be placed on art values of components and details; structures are coordinated as art and architecture. Lectures 3 hours per week.

ARCH 231-232 BUILDING EQUIPMENT I-II (4 cr.) (4 cr.)—Prerequisite ARCH 142. This subject presents to the student the basic principles of design and use of equipment in buildings. Plumbing, electrical and mechanical systems, air conditioning, and other utility equipment are considered along with their applications in modern buildings. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ARCH 236 BUILDING ELECTRIC POWER EQUIPMENT (3 cr.)—A general study of the types of heavy electric power equipment, loads, distribution forces, outdoor and indoor connections, overhead and underground transmission lines. Lectures 3 hours per week.

ARCH 237 BUILDING MECHANICAL EQUIPMENT (3 cr.)—General study of heating, air conditioning, plumbing and electrical equipment, materials and symbols. Building code requirements pertaining to residential and commercial structures; reading and interpretation of working drawings by mechanical engineers; coordination of mechanical and electrical features with structural and architectural designs. Lectures 3 hours per week.

ARCH 261 STRUCTURES I (4 cr.)—Prerequisite ENGR 153. A review of the design analysis procedures used in the selection of the structural elements of wood and steel framed buildings including methods of connections. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ARCH 262 STRUCTURES II (4 cr.)—Prerequisite ARCH 261. A review of the design analysis procedures used in the determination of the structural elements of the reinforced concrete framed building. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ARCH 270 BUILDING CODES AND REGULATIONS (4 cr.)—Corequisite ARCH 223. This subject is designed to provide a student with a comprehensive view of the codes and regulations encountered in the general area of the community college. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ARCH 276 CONSTRUCTION ESTIMATING (3 cr.)—Interpretation of working drawings for a project; preparation of material and labor quantity surveys from plans and specifications; approximate and detailed estimates of costs. The student will study materials take-off, sub-contractors' estimates of costs, and bid and contract procedures. Detailed inspection of the construction by comparing the finished work to the specifications. Lectures 3 hours per week.

ARCH 299 SEMINAR AND PROJECT IN ARCHITECTURAL TECHNOLOGY (2 cr.)—A selection and completion of an individual project related to the student's occupational objective and designed to combine theoretical concepts



with practical applications by cooperative arrangements with architectural firms. Also includes discussions of professional topics in general and a study of approaches to selection and pursuit of employment and career opportunities in architectural technology.

### **AUTOMOTIVE TECHNOLOGY**

**AUTO 006 BODY REPAIR (2 cr.)**—The basic design and construction of automobile bodies are studied. The fundamental principles of automobile body tools and materials are also covered. Laboratory 6 hours per week.

**AUTO 111-112-113 AUTOMOTIVE ENGINES I-II-III (4 cr.) (4 cr.) (4 cr.)**—The analysis of power, cylinder condition, valves, and bearings in the automotive engine to establish the present condition, repairs or adjustments to be made, and the estimated cost of these repairs or adjustments. Lectures 2 hours, Laboratory 6 hours, Total 8 hours per week.

**AUTO 121-122 AUTOMOTIVE FUEL SYSTEMS I-II (3 cr.) (3 cr.)**—The analysis of carburetors, fuel pumps and fuel lines. Estimation of repairs and adjustments to be made and the cost of these repairs and adjustments. Basic adjustments. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

**AUTO 136 AUTOMOTIVE LUBRICATION AND COOLING SYSTEMS I (3 cr.)**—Testing and analysis of lubrication systems to include lubricants, pumps, lines, filters and vents. Analysis of cooling systems, coolants, pumps, fans, lines and connections. Estimation of repairs and adjustments needed and cost of these. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

**AUTO 238 AUTOMOTIVE AIR CONDITIONING (3 cr.)**—Study of the principles of refrigeration, air conditioning controls, and the adjustments and general servicing of automotive air conditioning systems. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

**AUTO 241-242-243 AUTOMOTIVE ELECTRICAL SYSTEMS I-II III (3 cr.) (3 cr.) (3 cr.)**—Testing and analysis of battery, coil, distributor, starter, alternator or generator, voltage regulator and spark plugs. Estimation of repairs and adjustments to be made and the cost of these. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

**AUTO 251-252 POWER TRAIN I-II (4 cr.) (4 cr.)**—Analysis of transmission, propeller shaft, joints, differential, and rear axles for identification of repairs and adjustments. Lectures 2 hours, Laboratory 6 hours, Total 8 hours per week.

**AUTO 266 AUTOMOTIVE SUSPENSION & BRAKING SYSTEMS (3 cr.)**—Analysis of front end suspension and adjustment. Rear springs, braking system, and tire inflation check. Estimation of repairs and adjustments needed and the cost of these. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

**AUTO 271-272 SHOP MANAGEMENT AND CUSTOMER RELATIONS I-II (3 cr.) (3 cr.)**—A study of basic shop layout, personnel management, cost analysis, record keeping, and quality control. The shop manager, service salesman, and service writer's role in customer relations. Lectures 3 hours per week.

**AUTO 286 SERVICE PROCEDURE AND TUNE-UP (3 cr.)**—A study of procedures in the proper servicing of automobiles with emphasis on motor tune-ups. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

**AUTO 287 SERVICE PROCEDURES (3 cr.)**—A study of the proper steps involved in performing particular service operations on the automobiles. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

**AUTO 299 SEMINAR AND PROJECT IN AUTOMOTIVE TECHNOLOGY (2 cr.)**—A selection and completion of an individual project related to the student's occupational objective and designed to combine theoretical concepts with practical applications by cooperative arrangements with industry and automotive businesses. Also includes discussions of professional topics in general and a study of approaches to selection and pursuit of employment and career opportunities in automotive technology.

## BIOLOGY

**BIOL 101-102-103 GENERAL BIOLOGY I-II-III (4 cr.) (4 cr.) (4 cr.)**—Fundamental characteristics of living matter from the molecular level to the ecological community, with emphasis on general biological principles. Diversity of plant and animal life; evolutionary processes; adaptation of organisms to their environments. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**BIOL. 251-252 HUMAN ANATOMY AND PHYSIOLOGY I-II (4 cr.) (4 cr.)**—Prerequisite BIOL 103 and one year of College Chemistry. For students in the cooperative nursing curricula. A consideration of basic biological principles as revealed by anatomical and physiological studies. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**BIOL 268 MICROBIOLOGY (6 cr.)**—Prerequisite BIOL 103 and one year of College Chemistry. Introduction to microbiology, morphology and activities of micro-organisms; control of micro-organisms; infection, immunity and other antigen antibody reactions; study of infections and infectious diseases. Lectures 3 hours, Laboratory 6 hours, Total 9 hours per week.

## BUSINESS ADMINISTRATION

**BUAD 071-072-073-074 TRANSPORTATION AND TRAFFIC MANAGEMENT I-II-III-IV (3 cr.) (3 cr.) (3 cr.) (3 cr.)**—Basic to this course are the requirements for traffic managers in the fields of railroading, trucking, air travel, etc. Each quarter is based on the Chicago College of Traffic Materials which are required for licensing examination. Lectures 3 hours per week.

**BUAD 100 INTRODUCTION TO BUSINESS (3 cr.)**—Prerequisite ENGL 101 must have been taken previously or must be taken concurrently. An orientation course designed to give the student a general acquaintance with all types of business, organization, structure, legal aspects, and management operations. The various phases of business are studied from an operational point of view. Lectures 3 hours per week.

**BUAD 106 OFFICE PROCEDURES (2 cr.)**—This course is designed to enable the student to understand general office routines such as work flow, time scheduling, filing, and communications. Lectures 2 hours per week.

**BUAD 111-112-113 ACCOUNTING I-II-III (4 cr.) (4 cr.) (4 cr.)**—A course designed to provide an understanding of the fundamentals of accounting. Content includes the accounting cycle, journals, ledgers, working papers, and the

preparation of financial statements under the various forms of business ownership. Lectures 3 hours, Laboratory 2 hours, Total 5 hours per week.

**BUAD 156 OFFICE MACHINES (2 cr.)**—A course to develop proficiency in the use of office machines such as calculators and adding machines. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

**BUAD 170 BUSINESS ORGANIZATION AND MANAGEMENT (3 cr.)**—Prerequisite BUAD 100. This course deals with the basis of management and the management functions: planning, organizing, staffing, directing, and controlling. Management is examined as both a science and an art, with emphasis on both the formal body of knowledge and the personal abilities required of the successful manager. Lectures 3 hours per week.

**BUAD 219 MANAGERIAL ACCOUNTING (3 cr.)**—Prerequisite BUAD 113. Preparation, analysis, and interpretation of accounting and financial data for managerial purposes. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

**BUAD 220 COST ACCOUNTING (3 cr.)**—Prerequisite BUAD 111-112-113. Studies in accounting systems, methods and statements involved in process and job cost accounting, with attention to the use of standards and cost controls. Lectures 3 hours per week.

**BUAD 227 AUDITING (3 cr.)**—Prerequisite BUAD 111-112-113. Purposes of audit, relationships of auditor and client, kinds of audits, working papers, internal controls and examination of accounting systems, audit reports. Lectures 3 hours per week.

**BUAD 240 BUSINESS FINANCE (3 cr.)**—An introduction to the problems involved in the acquisition and use of funds necessary to the conduct of business. The course covers sources and instruments of capital and finance, financial organization, and financing of operations and adjustments. Lectures 3 hours per week.

**BUAD 241-242-243 BUSINESS LAW I-II-III (3 cr.) (3 cr.) (3 cr.)**—The application of rules of law to the operation of a business. It covers the legal aspects of the principal instruments of business activity, rights and liabilities of business principals and agents, formation and dissolution of ownership forms, and the legal aspects of negotiable instruments and securities. Lectures 3 hours per week.

**BUAD 248 BUSINESS TAXES (3 cr.)**—A study of applicable federal, state, and local taxes and their implications in terms of business ownership, policy, and operations. Lectures 3 hours per week.

**BUAD 277 PURCHASING AND MATERIALS MANAGEMENT (3 cr.)**—A study of the principles of purchasing and management of industrial inventories, including determination of requirements, pricing, source selection, and inventory policy and control. Lectures 3 hours per week.

**BUAD 286 PERSONNEL MANAGEMENT (2 cr.)**—A course in the problems and issues involved in the administration of personnel actions. Includes organization and tasks of personnel development, significant personnel considerations, and an appraisal of the position of labor in business today. Lectures 2 hours per week.

**BUAD 290 COORDINATED OCCUPATIONAL EXPERIENCE (1 cr.)**—This course may be repeated for credit. Laboratory 3 hours per week.

**BUAD 294 INTRODUCTION TO BUSINESS STATISTICS I (3 cr.)**—This course covers the collection, tabulation, and graphic presentation of data concerning business activity, economic trends and cycles, and similar fields, and the application of these techniques in solving practical business problems. Lectures 3 hours per week.

**BUAD 295 BUSINESS STATISTICS II (3 cr.)**—Prerequisite BUAD 294. A study of statistical and probability techniques and their use. Specific topics include the principal statistical concepts and techniques and their practical applications, including analysis, and the use of graphic presentation and solutions. Lectures 3 hours per week.

## CHEMISTRY

**CHEM 101-102-103 GENERAL CHEMISTRY I-II-III (4 cr.) (4 cr.) (4 cr.)**—Course designed to introduce the student to fundamental laws and theories of chemistry; the most important elements and their compounds; the basic facts; the properties and uses of the more important metallic and non-metallic elements and their general importance. The laboratory work in the third quarter includes qualitative analysis. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**CHEM 241-242-243 ORGANIC CHEMISTRY I-II-III (4 cr.) (4 cr.) (4 cr.)**—Prerequisite CHEM 103 or equivalent. A year course in the fundamentals of organic chemistry. The structure, physical properties, synthesis, and typical reactions of the various series of aliphatic, alicyclic, and aromatic compounds are studied with attention to reaction mechanisms. In the laboratory representative carbon compounds are synthesized with emphasis on basic laboratory techniques. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

## CIVIL (ENGINEERING) TECHNOLOGY

**CIVL 124-125 CIVIL ENGINEERING DRAFTING I-II (2 cr.) (2 cr.)**—Prerequisite ENGR 100 or ENGR 106. A two-course sequence in drawing designed to acquaint the student with the basic terminology and drafting procedures related to structural (steel, reinforced concrete, and timber) retailing, and highway drafting. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

**CIVL 140 CONSTRUCTION PLANNING (3 cr.)**—A basic course introducing the fundamental materials and equipment used in civil engineering construction. An introduction to the basic principles of construction planning is included. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

**CIVL 180 ELEMENTS OF SURVEYING (4 cr.)**—Introduction to the basic elements of surveying. Lecture and laboratory on the use and care of the modern survey equipment and the application of surveying in engineering construction. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**CIVL 204-205 CIVIL ENGINEERING TECHNOLOGY I-II (4 cr.) (4 cr.)**—Application of the principles of mechanics to the analysis and design of civil engineering structures, particularly in the areas of building and highway construction. Timber, steel, and concrete structures are considered. Laboratory periods are distributed between design problem and materials testing. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**CIVL 219 BUILDING DESIGN (4 cr.)**—Commercial-industrial building design, with emphasis on estimating, preparation, and reading of specifications and working drawings. Materials and methods of architectural construction. Lectures 4 hours per week.

**CIVL 256 SOIL MECHANICS (3 cr.)**—A study of soil in its relationship to engineering construction. The topics covered include soil density, sampling soil water, origin and nature of soil, flow nets, and seepage forces, classification of frost action, stabilization, stress, consolidation, settlement, shearing strength, stability, embankments, dams, retaining walls, piles and underground conduits. The laboratory work covers ASTM AND AASHTO specifications used in classifying and predicting the behavior of soils. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

**CIVL 259 BITUMINOUS TECHNOLOGY (4 cr.)**—Prerequisite or corequisite CIVL 256. Introduction to the basic properties of bituminous materials (primarily asphalt cement as used in highway construction). The testing of asphalt materials and the quality control of asphalt concrete mixtures are considered. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**CIVL 264 WATER RESOURCES TECHNOLOGY I (4 cr.)**—Introduction to the basic elements of hydrology and hydraulic systems as related to engineering projects. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**CIVL 265 WATER RESOURCES TECHNOLOGY II (3 cr.)**—Prerequisite CIVL 264. Continuation of CIVL 264 with emphasis on the application of hydraulic principles to the problems of water supply and sewage disposal. Introduction to the problems of water quality control. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

**CIVL 270 TRAFFIC AND TRANSPORTATION TECHNOLOGY (4 cr.)**—Introduction to the techniques of carrying out traffic and transportation surveys. The application of survey data to the planning, design, and operation of modern transportation systems is covered. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**CIVL 280 ADVANCED SURVEYING (4 cr.)**—Prerequisite CIVL 180. Closure and area computations, United States system of land surveys, stadia, contours, building layouts, lines and grades. Field topographic surveys and city surveys. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**CIVL 284 ROUTE SURVEYING AND HIGHWAY DESIGN I (4 cr.)**—Prerequisite CIVL 180. Principles of route surveying; simple, compound and transition curves; grades and vertical curves; earthwork and haul qualities. Credit cannot be given for this course and CIVL 185. Lectures 2 hours, Laboratory 6 hours, Total 8 hours per week.

**CIVL 285 ROUTE SURVEYING AND HIGHWAY DESIGN II (4 cr.)**—Prerequisite CIVL 284. A continuation of CIVL 284. Design and layout of road systems. Total 8 hours per week.

**CIVL 299 SEMINAR AND PROJECT IN CIVIL TECHNOLOGY (2 cr.)**—A selection and completion of an individual project related to the student's occupational objective and designed to combine theoretical concepts with practical applications by cooperative arrangements with industry. Also includes discussions of professional topics in general and a study of approaches to selection and pursuit of employment and career opportunities in civil technology.

## **DRAFTING AND DESIGN**

**DRFT 066-067 BASIC ELECTRICAL AND ELECTRONICS DRAWING (3 cr.) (3 cr.)**—A course for electronics' students only. Training will include care and use of drawing instruments, alphabet of lines, lettering, types of electrical and

electronic symbols, sketching, and basic electrical and electronics blueprint reading. Laboratory 9 hours per week.

**DRFT 071 BASIC BLUEPRINT READING I (2 cr.)**—Reading and interpreting various kinds of blueprints and working drawings. Making simple sketches, two and three dimensional. Lectures 1 hour, Laboratory 3 hours, Total 4 hours per week.

**DRFT 126 INTRODUCTION TO GRAPHIC PRESENTATION (3 cr.)**—Basic course in drawing, introduction to the use of instruments, lettering, sketching, and elementary drawing conventions. The importance of neat, legible drawings and the value of visual presentations in technology are discussed. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

**DRFT 131 MECHANICAL DRAFTING I (5 cr.)**—An introduction to Mechanical Engineering Drawing with heavy emphasis on industrial drafting practices. Course content includes: geometric construction, principles of orthographic projection, sections, theory and application of dimensioning and tolerancing. Lettering practice and technical sketching are also covered. Lectures 2 hours, Laboratory 12 hours, Total 14 hours per week.

**DRFT 132 MECHANICAL DRAFTING II (5 cr.)**—Prerequisite DRFT 131. Class activities include fasteners, preparation of assembly drawings and working drawings, shop practices and inspection procedures as they relate to the working drawing. Continued emphasis is placed on lettering skill and freehand sketching. Lecture 2 hours, Laboratory 12 hours, Total 14 hours per week.

**DRFT 133 MECHANICAL DRAFTING III (5 cr.)**—Prerequisite DRFT 132. This course is designed to focus the knowledge and skills acquired on practical industrial drawing problems. True position dimensioning, electrical drawings, piping and reproduction methods are discussed. Flat pattern layout, gearing, and design layout drawings are presented with emphasis on communication through graphic language. Lectures 2 hours, Laboratory 12 hours, Total 14 hours per week.

**DRFT 256 ELECTRONICS DRAFTING (2 cr.)**—Fundamental principles, practices, and methods of presenting electromechanical information through the graphic language. Principles of projection, fastening, materials and finishes, chassis design and fabrication, electronic symbology, diagrammatic drawings, printed circuit drawings, and checking of electronic drawings. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

**DRFT 266 STRUCTURAL DESIGN (4 cr.)**—A study of the design of the major structural elements used in framing commercial buildings with steel and timber. Design procedures for beams and girders and columns are presented, and methods of fastening are shown. Laboratory work consists of computations that follow and expand the principles explained in the classroom. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**DRFT 268 ELECTRICAL AND PIPE DRAFTING (2 cr.)**—Prerequisite ENGR 121, ENGR 122, and ELECTRICAL 214. Use of templates, symbols, and terminology; fundamentals in circuit drafting. Principles of proper selection, layout and installation of piping systems. Laboratory 6 hours per week.

## **DATA PROCESSING TECHNOLOGY**

**DAPR 100 INTRODUCTION TO DATA PROCESSING (4 cr.)**—Prerequisite one year of high school algebra. An introduction to basic methods, techniques, and

systems of manual, mechanical, and electronic data processing. Covers the history and development of punch card data processing, and electronic or automatic data processing. Monitors and controls digital computers to process predefined business or other data according to operating instructions. Lectures 3 hours, Laboratory 2 hours, Total 5 hours per week.

**DAPR 106 PRINCIPLES OF DATA PROCESSING (3 cr.)**—Prerequisite one year high school algebra. An introduction to basic methods, techniques, and systems of manual, mechanical, and electronic data processing. Covers the history and development of punch card data processing, and electronic or automatic data processing. Monitors and controls digital computers to process predefined business or other data according to operating instructions. Lectures 3 hours per week.

## **ECONOMICS**

**ECON 160 AMERICAN ECONOMICS (3 cr.)**—A survey of the history, principles, and policies of the American economic system. Some comparison with alternative economic systems. Lectures 3 hours per week.

**ECON 211-212-213 PRINCIPLES OF ECONOMICS I-II-III (3 cr.) (3 cr.) (3 cr.)**—The principles of economics and the bearing of these principles on present American conditions; structural and functional aspects of the economy. Analysis, problems, and issues relating to organization of business, labor, and government institutions, and economic stability and growth. Measurements of economic activity. Private enterprise, economic growth and stabilization policies, monetary and fiscal policy. International economic relationships, alternative economic systems. Lectures 3 hours per week.

**ECON 226 INDUSTRIAL ECONOMICS (3 cr.)**—The growth and development of industry and technology; industrial relations; some current problems, to include those posed by automation and computers. Lectures 3 hours per week.

**ECON 241-242-243 MONEY AND BANKING I-II-III (3 cr.) (3 cr.) (3 cr.)**—Prerequisite ECON 213. Monetary standards. The role of money in the performance of an economic system. Operation and evolution of the commercial and central banking systems. Further developments in the theory of money and income. Application of theory to analysis of policy questions, including government finance and debt management. Covers both macro and microeconomics. Lectures 3 hours per week.

**ECON 246 MONEY AND BANKING (3 cr.)**—Fundamental principles of money, credit, and banking and their exemplification in modern currency and banking history, particularly that of the United States. Special attention is given to present day conditions and problems. Lectures 3 hours per week.

## **ELECTRICAL ENGINEERING TECHNOLOGY**

**ELEC 111 ELECTRICAL CIRCUITS I (5 cr.)**—Corequisite MATH 122. The study of resistance, magnetism, inductance, capacitance, and the transient state. An introduction to circuit theorems as applied to direct current circuits. Lectures 4 hours, Laboratory 3 hours, Total 7 hours per week.

**ELEC 112 ELECTRICAL CIRCUITS II (4 cr.)**—Prerequisite ELEC 111. An advanced course in electrical circuits employing complex algebra, equivalent circuit theorems and modern techniques for the solution of complex circuit problems. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**ELEC 118-119 ELECTRICAL SHOP (1 cr.) (1 cr.)**—A course designed to familiarize the student with the use of hand tools commonly found in the electrical and electronics industry. A variety of projects requiring fabrication of electrical-mechanical equipment are performed. Laboratory 3 hours per week.

**ELEC 201 ELECTRICAL ENGINEERING TECHNOLOGY I (6 cr.)**—Prerequisite ELEC 112. An integrated course covering the basic concepts of electron and solid-state physics. Consideration is given to the application of vacuum, gas, and semiconductor diodes and triodes to basic electronic circuits. Lectures 5 hours, Laboratory 3 hours, total 8 hours per week.

**ELEC 202 ELECTRICAL ENGINEERING TECHNOLOGY II (7 cr.)**—Prerequisite ELEC 201. A continuation of ELEC 201, including more advanced semiconductor and tube theory. Amplifier operating characteristics and design considerations are studied. Laboratory experiments demonstrate the application of vacuum tubes and transistors to various circuits. Lectures 5 hours, Laboratory 6 hours, Total 11 hours per week.

**ELEC 203 ELECTRICAL ENGINEERING TECHNOLOGY III (7 cr.)**—Prerequisite ELEC 202. The application of principles covered in ELEC 201 and ELEC 202 to complex electronic systems. Laboratory experiments demonstrate the operating characteristics of single-stage and multi-stage circuits. Lectures 5 hours, Laboratory 6 hours, Total 11 hours per week.

**ELEC 211 ELECTRICAL MACHINES (4 cr.)**—Prerequisite ELEC 112. Construction, theory of operation, and application of direct current machinery and transformers both in single phase and polyphase. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**ELEC 212 ELECTRICAL MACHINES AND INDUSTRIAL CONTROLS (4 cr.)**—Prerequisite ELEC 211. Construction, theory of operation, characteristics, and application of alternators, synchronous motors, induction motors, and fractional horsepower motors. Introduction to the principles of industrial control. This introduction consists of circuit diagram functions and symbols, then advances into "traditional" motor control. The study of motor control consists of the principles of operation and application of the devices used for control and protection. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**ELEC 213 INDUSTRIAL CONTROLS (4 cr.)**—Prerequisite ELEC 212. The object of this course is to present a survey of principles and "building blocks" of industrial controls. This is done by analyzing involved control circuits, presenting the principles of operation and application of special electromagnetic and electronic devices; as well as feedback circuits, and introducing static controls, devices, logic symbols, and boolean algebra. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**ELEC 214 ELECTRICITY I (4 cr.)**—Prerequisites MATH 123 and PHYS 103. An introductory course for non-electrical students covering direct and alternating current theory with some introduction to electrical machines. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**ELEC 215 ELECTRICITY II (4 cr.)**—Prerequisite ELEC 214. A continuation of ELEC 214 for non-electrical students, covering basic electronic components and circuits. Control applications are emphasized in both the lecture and the lab. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**ELEC 241 COMMUNICATIONS I (4 cr.)**—Prerequisite ELEC 112. An introduction to modulation and power in modulated waves. Topics included are sinu-



soidal oscillations and oscillators, RF amplifiers and detectors, and AM receivers. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**ELEC 242 COMMUNICATIONS II (4 cr.)**—Prerequisite ELEC 241. A study of transmitters and receivers. Topics included are FM receivers, RF power amplification, AM, SSB, and FM transmitters, and an introduction to transmission lines and antennas. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**ELEC 243 COMMUNICATIONS SYSTEMS (4 cr.)**—Prerequisite ELEC 242. A study of microwave systems. Topics included are microwave tubes, wave-guides, antennas, and measurements at microwave frequencies. Also, an introduction to radar and television systems is presented. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**ELEC 248 MICROWAVE TECHNIQUES (3 cr.)**—Prerequisite ELEC 202. This brief course in microwave techniques serves to introduce the student to some of the special requirements when using very high frequency equipment such as klystrons, cavity resonators, slotted lines and waveguide type transmission devices. Lectures 3 hours per week.

**ELEC 258 ELECTRONIC DATA PROCESSING (3 cr.)**—Prerequisite ELEC 162. A course designed to familiarize the student with computer organization and basic programming techniques. Lectures 3 hours per week.

**ELEC 277 ELECTRICAL MEASUREMENTS (4 cr.)**—Prerequisite ELEC 112. A course in basic electrical measuring devices. Beginning with the development of standards and then introducing the common meters as AC and DC voltmeters, ammeters and wattmeters. The calibration of meters and the determination of instrumentation for simple measurements is also presented. Laboratory work emphasizes principles or operation of such devices as VTVM'S, oscilloscopes, precision, potentiometers, Q meters, AC bridges, counters, and other special equipment. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**ELEC 299 SEMINAR AND PROJECT IN ELECTRICAL ENGINEERING TECHNOLOGY (2 cr.)**—Prerequisite completion of 88 credit hours in the Electrical Engineering Technology Program. A selection and completion of an individual project related to the student's occupational objective and designed to combine theoretical concepts with practical applications by cooperative arrangements with industry. Also includes discussions of professional topics in general and a study of approaches to selection and pursuit of employment and career opportunities in electrical and electronics technology.

## ENGLISH

**ENGL 011 VERBAL EXPRESSION I (3 cr.)**—A course designed as one of a series to improve the students written and spoken communication. Review of effective writing practices. Emphasis on practical application: the writing of instructions, explanations, business letters, job applications, summary paragraphs. Lecture 3 hours per week.

**ENGL 012 VERBAL EXPRESSION II (3 cr.)**—Prerequisite ENGL 011 or equivalent. Continued practice in the methods of informative writing, outlining, reading for understanding, and vocabulary building. Practice in listening and speaking: giving and following instructions, explanations, interviewing for a job, short informative talks. Lecture 3 hours per week.

**ENGL 013 VERBAL EXPRESSION III (3 cr.)**—Prerequisite ENGL 012. A more advanced course. Emphasis on unity, development and organization in writ-

ing. Intensified practice in varied speaking and writing problems and brief reports. Lecture 3 hours per week.

ENGL 040-041-042 READING IMPROVEMENT (3 cr.) (3 cr.) (3 cr.)—Designed to improve skills in reading speed and comprehension through the use of modern techniques, equipment and materials. Individualized work adapted to special reading problems wherever necessary. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

ENGL 101 COMMUNICATION SKILLS I (3 cr.)—Prerequisite satisfactory score on English Expression portion of American College Test or equivalent. An introductory course in using the English language appropriately and precisely. Designed to improve the student's ability to write effectively. Emphasis on vocabulary, spelling, and reading comprehension. Lectures 3 hours per week.

ENGL 102 COMMUNICATION SKILLS II (3 cr.)—Prerequisite ENGL 101. Designed to help students increase their competence in thinking critically, expressing their thoughts clearly, writing effectively, and appreciating the creative ability of others, by considering selected examples of communication in all mediums. Literature serves as both model and subject for students in achieving these goals. Includes basic research methods, outlining, and technical report writing. Lectures 3 hours per week.

ENGL 111-112-113 ENGLISH COMPOSITION I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite successful completion of 4 units of high school English and a satisfactory score on the English Expression portion of the American College Test or equivalent. Expository writing, ranging from single paragraphs to essays of some length and complexity. Study of the logical, rhetorical, and linguistic structures of expository prose; the methods and conventions of preparing research papers; and the practical criticism of major literary types. Lectures, 3 hours per week.

ENGL 120 INTRODUCTION TO JOURNALISM (3 cr.)—Mass communication media which have reporting functions are surveyed as preparation for study in specific areas. Contributions of newspapers, magazines, radio, and television to journalistic techniques are shown and special news gathering organizations are examined. Beginning instruction and practice in news writing is included. Lectures 3 hours per week.

ENGL 127 TECHNICAL REPORT WRITING (2 cr.)—A course designed to provide skill training in the preparation of reports, memoranda, articles and correspondence related to technical occupations through the use of specialized materials related to the students' occupational goals. Lectures 2 hours per week.

ENGL 227 TECHNICAL REPORT WRITING (3 cr.)—A course in the basic concepts of good report writing in technical fields. Designed to give the student practice in collecting and presenting material in an orderly and correct manner. Lectures 3 hours per week.

ENGL 250 SURVEY OF AMERICAN LITERATURE (3 cr.)—Prerequisite ENGL 113 or equivalent. This is a survey course comprising the study of such authors and their works from Colonial Times to the present as best interpret American life and ideas. It requires an adequate amount of parallel reading, especially the novel and drama. Lectures 3 hours per week.

ENGL 261-262-263 ENGLISH LITERATURE I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite ENGL 113 or equivalent. Historical survey of English literature, to include the novel, tragedy, drama, comedy, and poetry. Emphasis upon development of critical judgment and taste in reading superior literature with appreciation and in writing about it. Lectures 3 hours per week.

**ENGL 280 BUSINESS ENGLISH (3 cr.)**—Prerequisites ENGL 101, 102 and 136. An intensive study of the qualities and techniques required in the preparation of business correspondence, reports, articles, and memoranda. A practical course in the reading and writing of business-related materials with emphasis on comprehension, analysis, and organization of ideas in a logical pattern. Lectures 3 hours per week.

**ENGL 287 INCIDENT INVESTIGATION REPORTING (3 cr.)**—This course is designed for writing accurate and concise paragraphs and summaries of incidents, misdemeanors, and felonies. Emphasis on investigation, observation and reporting in detail. Special attention will be given to law enforcement forms for analysis and practice. Lectures 3 hours per week.

### **ENGINEERING TECHNOLOGY**

**ENGR 009 REVIEW TO ENGINEERING EXAMS (3 cr.)**—Registration laws, procedures, review of engineering fundamentals, preparatory to public examination for the engineering training part of the Professional Engineers examination. Lectures 3 hours per week.

**ENGR 100 INTRODUCTION TO ENGINEERING (1 cr.)**—Professional fields of engineering; the work of the engineer, requirements of training and character, professional ethics, the division of industrial practice and competition. Pure and simple problems from the various schools of engineering are used with slide rule applications. Laboratory 3 hours per week.

**ENGR 121 ENGINEERING GRAPHICS I (2 cr.)**—A basic course in drawing and theories of projection. Multiview drawings, pictorial drawings and sketching, geometrical construction, sectioning, lettering, dimensioning, auxiliary views, revolutions, assembly drawings. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

**ENGR 122 ENGINEERING GRAPHICS II (2 cr.)**—Prerequisite ENGR 121. Graphical methods used in engineering design, layout and calculation. Properties and types of graphs for engineering and scientific purposes. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

**ENGR 123 DESCRIPTIVE GEOMETRY (3 cr.)**—Prerequisite ENGR 122. A study of the analysis and graphic presentation of the space relationship of fundamental geometric figures: point, line, plane, curved surfaces, development and vectors. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

**ENGR 151 MECHANICS I (STATICS) (3 cr.)**—Prerequisite MATH 122. Subject matter includes principles and applications of free body diagrams for force systems, shear and moment diagrams, deflection of beams by numerical integration, and determination of section properties. Lectures 3 hours per week.

**ENGR 152 MECHANICS II (STRENGTH OF MATERIALS) (4 cr.)**—Prerequisite ENGR 151, MATH 123. A discussion of strength of material concepts with laboratory demonstrations and experiments.

**ENGR 153 MECHANICS III (3 cr.)**—Prerequisite ENGR 151 and MATH 123 or equivalent. Additional topics in the study of rigid body mechanics, including kinetics, kinematics, and advanced strength of materials. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

**ENGR 251 ENGINEERING MECHANICS I (STATIC) (4 cr.)**—Prerequisite ENGR 123, MATH 143. Corequisite MATH 241 and PHYS 221. Vector treat-

ment 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. Lectures 4 hours per week.

**ENGR 252 ENGINEERING MECHANICS II (DYNAMICS) (5 cr.)**—Prerequisite ENGR 251. Corequisite MATH 242 and PHYS 222. Vector treatment 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. Lectures 4 hours per week.

**ENGR 253 ENGINEERING MECHANICS III (MECHANICS OF SOLIDS) (4 cr.)**—Prerequisite ENGR 251. Corequisite MATH 243 and PHYS 223. Introductory mechanics of continuous media, concepts of stress and deformation due to longitudinal loads, torsion and bending; plane stress. Lectures 4 hours per week.

## FRENCH

**FREN 101-102-103 ELEMENTARY FRENCH I-II-III (4 cr.) (4 cr.) (4 cr.)**—Introductory training in the speaking, understanding, reading, and writing of French. Lectures 3 hours, Laboratory and drill 2 hours, Total 5 hours per week.

**FREN 201-202-203 INTERMEDIATE FRENCH I-II-III (3 cr.) (3 cr.) (3 cr.)**—Prerequisite FREN 103 or successful completion of two years of high school French. Advanced training in the speaking, understanding, reading, and writing of French. French is used in the classroom. Lectures 3 hours, Laboratory and drill 2 hours, Total 5 hours per week.

**FREN 231-232-233 INTRODUCTION TO FRENCH CIVILIZATION AND LITERATURE I-II-III (3 cr.) (3 cr.) (3 cr.)**—Prerequisite FREN 203 or equivalent. An introduction to the background of French life and culture and to the outstanding contributions of France to world civilization from medieval times to the present. Reading is in the original French and French is used in the classroom. Lectures 3 hours per week.

## GENERAL

**GENL 100 ORIENTATION (1 cr.)**—This course, required of all beginning college students, is designed essentially as an instrument of group guidance and deals with such problems as adjustment to college, purposes and functions of the college, planning for the future, and making the most of the college years and what the college has to offer. Particular emphasis is placed on experiences designed to improve study habits and skills such as reading, listening, and library activities. Lectures 1 hour, Laboratory or seminar 1 hour, Total of 2 hours per week.

## GEOGRAPHY

**GEOG 240 INTRODUCTION TO PHYSICAL GEOGRAPHY (3 cr.)**—A study of the major elements of the natural environment, such as land forms, weather and climate, natural vegetation, and soils. Lectures 3 hours per week.

**GEOG 250 INTRODUCTION TO CULTURAL GEOGRAPHY (3 cr.)**—A survey of landscape modification through human agencies and the relationships of culture and geography. Lectures 3 hours per week.

**GEOG 260 INTRODUCTION TO ECONOMIC GEOGRAPHY (3 cr.)**—A geographic survey of primary production, manufacturing, mining, and trade, covering agriculture, forestry, and fishing. Lectures 3 hours per week.

### **GEOLOGY**

**GEOL 101-102-103 GENERAL GEOLOGY I-II-III (4 cr.) (4 cr.) (4 cr.)**—Physical geology; the various modifying agencies at work upon the earth, and their effects; the composition and structure of the earth as a whole. Historical geology; the history of the earth and its plants and animals from the beginning to the present, with emphasis on the principles involved in interpreting geologic evidence. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

### **GERMAN**

**GERM 101-102-103 ELEMENTARY GERMAN I-II-III (4 cr.) (4 cr.) (4 cr.)**—Introductory training in the understanding, speaking, reading, and writing of German with emphasis on manipulation of the structure of the language. Lectures 3 hours, Laboratory and drill 2 hours, Total 5 hours per week.

**GERM 201-202-203 INTERMEDIATE GERMAN I-II-III (3 cr.) (3 cr.) (3 cr.)**—Prerequisite GERM 103 or successful completion of two years of high school German. Advanced training in the speaking, understanding, reading, and writing of German. German is used in the classroom. Lectures 3 hours, Laboratory and drill 2 hours, Total 5 hours per week.

**GERM 231-232-233 INTRODUCTION TO GERMAN LITERATURE I-II-III (3 cr.) (3 cr.) (3 cr.)**—Prerequisite GERM 203 or equivalent. Readings in selected works of German literature. German is used in the classroom. Lectures 3 hours per week.

### **GOVERNMENT**

**GOVT 180 AMERICAN CONSTITUTIONAL GOVERNMENT (3 cr.)**—An introductory course in American government, including fundamental concepts and principles of our constitutional system at the national, state, and local levels. Lectures 3 hours per week.

**GOVT 281-282-283 UNITED STATES GOVERNMENT I-II-III (3 cr.) (3 cr.) (3 cr.)**—Elements of political science, powers, organization, and functions of the legislative, executive, and judicial branches of the national, state, and local governments in the United States; Democracy, federalism, the Constitution, and civil liberties. Lectures 3 hours per week.

**GOVT 296 SEMINAR IN PUBLIC AFFAIRS (2 cr.)**—Prerequisite GOVT 180 or equivalent. Seminar in current public affairs concerning domestic and foreign policy of the United States. Purpose is to develop the ability to analyze and critically evaluate present problems as they relate to the functioning of the United States. Lectures and Seminars 2 hours per week.

### **HEALTH**

**HLTH 100 CONCEPTS OF HEALTH AND ILLNESS (2 cr.)**—Emphasizes the maintenance of health and prevention of illness at the personal and community level. It is designed to acquaint students with the causes of illness, the body's response to illness and some methods of diagnosis, treatment and prevention of

illness. Some principles of care common to all patients will be introduced. Lecture 2 hours per week.

HLTH 110 PERSONAL AND COMMUNITY HEALTH (2 cr.)—An introductory course in personal hygiene with emphasis upon social principles. Lectures 2 hours per week.

## HISTORY

HIST 101-102-103 HISTORY OF WESTERN CIVILIZATION I-II-III (3 cr.) (3 cr.) (3 cr.)—The development of western civilization from ancient times to the present. The last two quarters deal with a survey of the period since the close of the Reformation. Lectures 3 hours per week.

HIST 111-112-113 AMERICAN HISTORY I-II-III (3 cr.) (3 cr.) (3 cr.)—A survey of United States history from its beginning in early colonial times to the present. Lectures 3 hours per week.

HIST 221-222 AMERICAN ECONOMIC HISTORY I-II (3 cr.) (3 cr.)—First quarter deals with the economic history of the 19th and early 20th centuries in the United States. The second quarter deals with the remainder of the 20th century with special emphasis on the 1920's and 1930's. Lectures 3 hours per week.

HIST 251-252-253 HISTORY OF MODERN EUROPE I-II-III (3 cr.) (3 cr.) (3 cr.)—The political, social, and economic developments in Europe from 1500 to the present. Lectures 3 hours per week.

## HUMANITIES

HUMN 204-205 SURVEY OF WESTERN CULTURE I-II (5 cr.) (4 cr.)—A survey of the Western world which correlates the art, music and literature of the following periods: Greek and Roman, Middle Ages, Renaissance, Elizabethan, Neo-Classical, and Modern. Lectures 5 hours per week for HUMN 204 and 4 hours per week for HUMN 205.

## INDUSTRIAL TECHNOLOGY

INDT 141 METHODS OF MANUFACTURE I (3 cr.)—An introduction to an understanding of the processes and equipment used in the manufacture of metal parts, plastic materials; information includes design cost and material and tool forms involved in selecting a method of manufacture. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

INDT 142 METHODS OF MANUFACTURE II (3 cr.)—Prerequisite INDT 141. Emphasis on the understanding of production techniques, production tools; includes discussions of lathes, millers, shapers, jig borer; machine controls and inspection techniques. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

## MATHEMATICS

MATH 011-012-013 ELEMENTS OF MATHEMATICS I-II-III (3 cr.) (3 cr.) (3 cr.)—Designed for the occupational student. This course involves practical applications of elementary mathematics, including algebra, geometry, and trigonometry, to the common everyday problems in the manufacturing and trade world. The instructional materials meet the full requirements for elementary mathe-

matics in the machinist, drafting, toolmaking, and auto mechanics trades. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

**MATH 031-032 BASIC ALGEBRA I-II (5 cr.) (5 cr.)**—Fundamentals of algebraic calculations for students who want a basic review of the principles of algebra. The first course (MATH 031) reviews introductory algebra and the second course (MATH 032) reviews the second year of high school algebra. The course is designed to provide the necessary proficiency in algebra required for entry into an associate degree program. Lectures 5 hours per week.

**MATH 036 BASIC PLANE GEOMETRY (5 cr.)**—Fundamentals of plane geometry for students who want an introduction to plane geometry. The course will provide the necessary proficiency in plane geometry required for entry in an associate degree program. Lectures 5 hours per week.

**MATH 039 REVIEW OF ALGEBRA AND TRIGONOMETRY (5 cr.)**—Prerequisite MATH 031-032 and 036 or equivalent. Trigonometric functions, graphic representations, logarithms, laws of sine and cosines, trigonometric equations, inverse functions, and complex numbers. Lectures 5 hours per week.

**MATH 121-122-123 ENGINEERING TECHNICAL MATHEMATICS I-II-III (5 cr.) (5 cr.) (5 cr.)**—Prerequisite three units of high school mathematics and a satisfactory mathematics score on the ACT test or MATH 036 and MATH 039 or equivalent. Algebra, trigonometry, and introduction to calculus. The course sequence includes solutions of linear and quadratic equations, trigonometric functions, trigonometric curve sketching, logarithms, ratio, proportion and variation, vectors, complex numbers and binomial theorem. Lectures 5 hours per week.

**MATH 131-132-133 COLLEGE ALGEBRA AND TRIGONOMETRY I-II-III (3 cr.) (3 cr.) (3 cr.)**—Prerequisite three units of high school mathematics and a satisfactory mathematics score on the ACT test or MATH 031, 032, and 036. Sets and numbers; the logic of algebra; the order of axioms; functions, algebraic and transcendental; determinants; the binomial theorem; mathematical induction; trigonometry; application. Lectures 3 hours per week.

**MATH 141-142-143 INTRODUCTORY MATHEMATICAL ANALYSIS I-II-III (5 cr.) (5 cr.) (5 cr.)**—Prerequisite satisfactory mathematics score on the ACT test and four units of high school mathematics including two units of algebra, one unit of geometry, and one-half unit of trigonometry, or MATH 036 and MATH 039 or equivalent. A modern unified course in algebra, trigonometry, analytic geometry, and calculus designed primarily for engineering and science students. Lectures 5 hours per week.

**MATH 151-152 BUSINESS MATHEMATICS I-II (3 cr.) (3 cr.)**—Prerequisite a strong background in the basic arithmetic operation. Instruction, review and drill in percentage, cash and trade discounts, markup, payroll, sales, property and other taxes, simple and compound interest, bank discounts, interest, investments and annuities. Lectures 3 hours per week.

**MATH 180 INTRODUCTORY STATISTICS (5 cr.)**—Introduction to the fundamental ideas of statistics, including a brief treatment of descriptive statistics, problems of sampling, estimation, testing or hypotheses, regression, and correlation. Lectures 5 hours per week.

**MATH 241-242-243 ADVANCED MATHEMATICAL ANALYSIS I-II-III (4 cr.) (4 cr.) (4 cr.)**—(For students in Engineering and Science Curricula.) Prerequisite MATH 143. A modern course including vectors, matrices, partial differentiation, multiple integrals, infinite series, and differential equations. Lectures 4 hours per week.

MATH 271-272-273 CALCULUS I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite MATH 133 or equivalent. Functions; analytic geometry of the plane; rate of change; limits; continuity; differentiation of algebraic functions; differentials; definite and indefinite integrals. Lectures 4 hours per week.

### MECHANICAL ENGINEERING TECHNOLOGY

MECH 214-215 MECHANICAL DESIGN I-II (4 cr.) (4 cr.)—Prerequisite MATH 123, ENGR 152. Application of the principles of mechanics to the analysis and design of tools and machine elements, including the factors that influence the selection of materials used in mechanical design. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 246 METALLURGY (4 cr.)—Prerequisite INDT 142. Fundamentals of metallurgy, grain size, effect of carbon content, and hardness testing devices. Different alloys will be tested to determine the effect of heat treatment. Lecture 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 264 THERMODYNAMICS (4 cr.)—Prerequisite PHYS 103, MATH 123. Basic thermodynamics; characteristics of gases; applied study of steam cycles and combustion processes. Laboratory includes application of principles covered in lecture. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 265 THERMODYNAMICS II (4 cr.)—Prerequisite MECH 264. Advanced thermodynamics with emphasis both in lecture and laboratory to applications relating to internal combustion engines and gas turbines. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 267 FLUID MECHANICS (4 cr.)—Prerequisites PHYS 123 and MATH 123. Properties of fluids and fluid flow, Bernoulli's Theorem, measuring devices, viscosity and dimensional analysis. Laboratory emphasis on pumps, piping and fluid motors. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

MECH 299 SEMINAR AND PROJECT IN MECHANICAL TECHNOLOGY (2 cr.)—A selection and completion of an individual project related to the student's occupational objectives and designed to combine theoretical concepts with practical applications by cooperative arrangements with industry. Also includes discussions of professional copies of general and a study of approaches to selection and pursuit of employment and career opportunities in machines and mechanical technology.

### MUSIC

MUSC 121-122-123 INTRODUCTION TO MUSIC LITERATURE I-II-III (3 cr.) (3 cr.) (3 cr.)—The study of representative musical composition from the Middle Ages to the present. The purpose of this study is to train students in intelligent listening and to provide them with an understanding of our musical heritage and will serve as a basis for lifelong interest in music. No previous knowledge of music is required. Lectures 3 hours per week.

MUSC 211-212-213 INTRODUCTION TO MUSICAL THEORY I-II-III (3 cr.) (3 cr.) (3 cr.)—(No previous training in music is required.) The materials of music, rhythm, melody, timbre and harmony. The elements of musical composition with an emphasis on analysis and individual exercises. The harmonic vocabulary; a study of chords and their application in musical design. Lectures 3 hours per week.



## PHYSICAL EDUCATION

PHED 101-102-103 PHYSICAL EDUCATION I-II-III (1 cr.) (1 cr.) (1 cr.)—An introductory study of recreational and physical education activities that will have value for the individual in adult life in developing physical skills for more effective use of leisure time. The development of skills and methods in archery, bowling, general conditioning, golf, gymnastics, horseback riding, ice skating, jogging, swimming, tennis and volleyball are stressed. Lecture 1 hour, Clinic 1 hour, Total 2 hours per week.

## PHILOSOPHY AND RELIGION

PHIL 101 INTRODUCTION TO PHILOSOPHY I (3 cr.)—Reading and informal discussion of Plato's Republic and the writings of several recent thinkers who deal with the problems of economics, society, and government in their relation to human welfare in general. Lectures 3 hours per week.

PHIL 102 INTRODUCTION TO PHILOSOPHY II (3 cr.)—An introductory study of some basic philosophical problems concerning the perception and belief of man in society. Lectures 3 hours per week.

PHIL 110 LOGIC (3 cr.)—The study of logic as the scientific investigation of valid reasoning. Lectures 3 hours per week.

PHIL 221 LITERATURE OF THE BIBLE I (3 cr.)—A study of the literature of the Old Testament. Lectures 3 hours per week.

PHIL 222 LITERATURE OF THE BIBLE II (3 cr.)—A study of the literature of the New Testament. Lectures 3 hours per week.

PHIL 266 COMPARATIVE RELIGION (3 cr.)—A survey of the literature of comparative religions of the world. Lectures 3 hours per week.

## PHYSICS

PHYS 011-012-013 BASIC APPLIED PHYSICS I-II-III (4 cr.) (4 cr.) (4 cr.)—A study of general physics including mechanics, heat, sound, electricity and light with practical applications for students in occupational programs. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

PHYS 121-122-123 GENERAL COLLEGE PHYSICS I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite two years of algebra, one year of plane geometry. Corequisite MATH 131 or equivalent. General freshman physics. Fundamentals and principles of physics, including mechanics, heat, sound, electricity, and light. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

PHYS 221-222-223 COLLEGE PHYSICS I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite MATH 143 and corequisite MATH 241 or equivalent. General college physics for students of engineering and the mathematical sciences. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

## POLICE SCIENCE

PLCE 100 INTRODUCTION TO LAW ENFORCEMENT (3 cr.)—The philosophy and history of law enforcement; overview of crime and police problems; organization and jurisdiction of local, state and Federal law enforcement agencies, survey of professional career opportunities and qualifications required. Open to all students as exploratory course. Lectures 3 hours per week.

**PLCE 110 PATROL ADMINISTRATION (3 cr.)**—The theories, history, and development of police patrol. Examines the methods and techniques of the various types of patrol and their importance to the overall police function. Focuses on the responsibilities of patrol officers and supervisors in identifying police hazards, preventing crime, providing police services, and establishing sound public relations. Practical exercises are included. Lectures 3 hours per week.

**PLCE 111 POLICE ORGANIZATION AND ADMINISTRATION I (3 cr.)**—Prerequisite PLCE 100. Principles of organization and administration in law enforcement; functions and activities; planning and research; public relations; personnel and training; inspection and control; police formulation. Lectures 3 hours per week.

**PLCE 112 POLICE ORGANIZATION AND ADMINISTRATION II (3 cr.)**—Prerequisite PLCE 111. Principles of organization and administration as applied to operational services. Patrol; criminal investigation; intelligence and vice units; juvenile units; traffic administration. Lectures 3 hours per week.

**PLCE 120 SPECIAL ENFORCEMENT PROBLEMS (3 cr.)**—Crowd control during civil demonstrations, picketing, rioting, and other emergency situations; the police role in civil defense; police problems caused by narcotics addiction; the handling of mentally or emotionally abnormal persons. Lectures 3 hours per week.

**PLCE 126 PREVENTION AND CONTROL OF JUVENILE DELINQUENCY (3 cr.)**—Survey of youth crime, stressing the police role in community programs of prevention and control. Lectures 3 hours per week.

**PLCE 130 CRIMINAL LAW (3 cr.)**—Major crimes; their classification, elements of proof, intent, conspiracy, responsibility, parties, and defenses. Emphasis on the common law and Virginia adaptations. Lectures 3 hours per week.

**PLCE 136 LEGAL EVIDENCE (3 cr.)**—Kinds, degrees, and admissibility of evidence; methods and techniques of its acquisition, and use in criminal proceedings. Moot court activities are included. Lectures 3 hours per week.

**PLCE 150 INTRODUCTORY POLICE PHOTOGRAPHY (2 cr.)**—Fundamental photographic skills; uses of photography in law enforcement and in courtroom presentations. Practical exercises are included. Lectures 2 hours per week.

**PLCE 160 POLICE COMMUNICATION AND RECORDS (3 cr.)**—Principles of organization and administration as applied to auxiliary services. Records and communications, custody, central services, and police logistics. Special attention to police applications of electronic data processing and the collection of performance data. Lectures 3 hours per week.

**PLCE 187 TRAFFIC ADMINISTRATION AND CONTROL (3 cr.)**—Modern methods of traffic facilitation and control; Virginia traffic offenses; techniques of selective enforcement and of accident investigation; police responsibilities in special situations. Practical exercises are included. Lectures 3 hours per week.

**PLCE 237 ADMINISTRATION OF JUSTICE (3 cr.)**—Review of court systems, with emphasis on Northern Virginia procedures from incident to final disposition of the accused, and on applicable principles of criminal and civil law. Includes field trips to, and guest lectures by representatives of, local agencies and tribunals. Limited to students who have successfully completed five quarters of the A. S. program in Police Science, or who have secured written permission of the instructor. Lectures 3 hours per week.

**PLCE 244 PRINCIPLES OF CRIMINAL INVESTIGATION (3 cr.)**—Conduct

at the crime scene; collection and handling of evidence; interviewing and interrogations; obtaining statements, admissions, and confessions; testifying in court. Practical exercises are included. Lectures 3 hours per week.

**PLCE 245 ADVANCED CRIMINAL INVESTIGATION (3 cr.)**—Prerequisite PLCE 244. Continued study of the investigative process; introduction to scientific aids and examinations; application of investigative techniques to specific offenses. Practical exercises are included. Lectures 3 hours per week.

**PLCE 270 INDUSTRIAL AND COMMERCIAL SECURITY (3 cr.)**—Organization, methods, techniques and equipment for physical protection of industrial and commercial facilities and prevention of theft of merchandise and valuables by persons within and without those facilities. Practical exercises are included. Lectures 3 hours per week.

**PLCE 299 SEMINAR AND PROJECT IN LAW ENFORCEMENT (2 cr.)**—An examination of selected, critical problems in law enforcement. Student selection with the approval of the instructor of a research topic for the preparation and discussion of a paper which is pertinent to a timely topic in law enforcement or to anticipated employment in a federal, state, or local law enforcement agency. Limited to students who have successfully completed five quarters of the program in Police Science or who have secured written permission of the instructor.

## PSYCHOLOGY

**PSYC 110 PRINCIPLES OF APPLIED PSYCHOLOGY (3 cr.)**—The general principles of perception, learning, and conscious and unconscious motivation which are operative in all practical applications of psychology to life and work. Credit cannot be received for both this course and PSYC 128. Lectures 3 hours per week.

**PSYC 116 THE PSYCHOLOGY OF PERSONAL ADJUSTMENT (3 cr.)**—Prerequisite PSYC 110. Characteristics of mental health. Psychological principles applied to the development of a mature personality and to the problems of everyday life. Effective methods in study and work. Credit cannot be received for both this course and PSYC 128. Lectures 3 hours per week.

**PSYC 128 HUMAN RELATIONS (3 cr.)**—Introduction to the study of human personality and its reaction upon other personalities. The application of psychology to problems in industry and private life. Some introduction to such matters as selection, training and placement of employees. Lectures 3 hours per week.

**PSYC 201-202-203 GENERAL PSYCHOLOGY I-II-III (3 cr.) (3 cr.) (3 cr.)**—The principles of behavior with a relating of experimental data to practical problems: the measurement of ability, sensory and perceptive processes, organic basis of behavior, hereditary, maturation, learning and thinking, motivation, emotion, personality and social factors in behavior. Lectures 3 hours per week.

**PSYC 230 CHILD GROWTH AND DEVELOPMENT (5 cr.)**—The principles and processes of human development, with emphasis upon the role of experience. Major aspects of the personality (motive, emotion, intellect, etc.) are traced through experimental stages, and their characteristic interaction in organized behavior examined. Lectures 5 hours per week.

**PSYC 246 EDUCATIONAL PSYCHOLOGY (5 cr.)**—Prerequisite PSYC 202 or equivalent. Human behavior and learning treated in the context of educational processes. The nature of various mental characteristics (intelligence, interest,

knowledge, etc.) is examined, with special consideration given to their measurement and appraisal and their significance for educational goals. Lectures 5 hours per week.

**PSYC 257 LAW ENFORCEMENT PSYCHOLOGY (3 cr.)**—Prerequisite PSYC 128 or PSYC 110 and 116. Intergroup relations and police work. Some facts about racial, religious and national differences. Prejudice, suggestion, emotion, frustration and aggression in interpersonal and intergroup situations. Types of abnormal behavior likely to be encountered in police work. Lectures 3 hours per week.

## **RADIO AND TELEVISION**

**RDTV 111-112-113 INTRODUCTION TO TELEVISION I-II-III (4 cr.) (4 cr.) (4 cr.)**—A survey of the organization and principles of telecasting operations, including positions and responsibilities, camera techniques, lighting, sound film, control room, settings, scenery, properties, floor directing, floor organization, scripting, television art, and on-camera performance. Lectures, reading assignments, and special projects in addition to laboratory work provide the student with an understanding of the TV industry: its history and development and its fundamental principles of operation, from both the commercial and the non-commercial point of view. This is a general background course designed to familiarize the student with the skills and techniques in the listed area through observation, study, and participation. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

**RDTV 181-182-183 TELEVISION WORKSHOP I-II-III (2 cr.) (2 cr.) (2 cr.)**—Students are assigned to floor crew positions so that they may observe and then take part in studio operations at the local ETV station. These assignments include such positions as floor director, projection assistant, property supervisor, and cameraman. Laboratory 6 hours per week.

**RDTV 221-222-223 TELEVISION PRODUCTION I-II-III (5 cr.) (5 cr.) (5 cr.)**—Prerequisite RDTV 113. Introductory training is provided in discharging the responsibilities and duties of the television producer that are involved in organizing, planning, and producing television programs. These relate to program formats, production techniques, program costs, technical facilities, crew management, selection of talent, and relationship between director and producer. Students study and write different types of television programs and produce them in the TV studio. They gain practical experience as cameramen, microphone boom operators, announcers, floor directors, continuity writers, technical directors, lighting technicians, property directors, studio managers, talent, and floor crew. They learn also the responsibilities of each crew position and of the performer under actual working conditions. Student productions are kinescope recorded for analysis and evaluation. Lectures 3 hours, Laboratory 6 hours, Total 9 hours per week.

**RDTV 226 TELEVISION AND RADIO NEWSWRITING (3 cr.)**—Prerequisite ENGL 102 or equivalent. A study of the fundamentals of radio and television newswriting. Students learn to prepare newscasts, using wire service copy, local news sources, interviews, still photos, and newsreels. Practical experience is gained on the production of newscasts and interviews through laboratory assignments in the studios at the local ETV station. Lectures 3 hours per week.

**RDTV 231-232-233 TECHNICAL PROBLEMS OF TELEVISION I-II-III (4 cr.) (4 cr.) (4 cr.)**—Prerequisite RDTV 113. Training is given in the design, construction, and handling of television scenery, special effects devices, visual materials, and sound effects. Special lighting problems are considered, using stan-

dard and rear projection scenery. A study is made of the uses of motion picture film in television, with training in cinematography as applied to television, in editing of film, in the care and handling of silent and sound film, and in the technical aspects of motion picture film projection and slide projection equipment. Practice is provided in the operation of the television camera. Observation and practice in the laboratory provide opportunity to experiment and learn more advanced directing techniques. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

RDTV 281-282-283 TELEVISION WORKSHOP IV-V-VI (2 cr.) (2 cr.) (2 cr.)—Prerequisite RDTV 183 or equivalent. Advanced practical studio experience is provided so that each student has an opportunity for "on the air" experience in all phases of television work within the educational station. Laboratory 6 hours per week.

RDTV 299 SEMINAR AND PROJECT IN COMMUNITY TECHNOLOGY (2 cr.)—A selection and completion of an individual project related to the student's occupational objective and designed to combine theoretical concepts with practical applications by cooperative arrangements with the radio and television industry. Also includes discussions of professional topics in general and a study of approaches to selection and pursuit of employment and career opportunities in radio and television.

## SECRETARIAL SCIENCE

SECR 009 STENOGRAPHIC REVIEW (3 cr.)—A refresher and upgrading course for secretaries, particularly for those returning to work after some absence. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

SECR 101-102-103 STENOGRAPHIC SKILLS I-II-III (8 cr.) (8 cr.) (8 cr.)—Training in stenographic and secretarial skills in an office environment. Typewriting and shorthand, with emphasis on production; units in the use of the adding machine, rotary calculator, fluid duplicator, mimeograph, dictating and transcribing machines, and office copying machines are included. Practice in typing letters, reports, financial statements and in the preparation of spirit masters, mimeograph stencils and offset paper masters. Studying the use of the telephone, telegraph, filing, taking care of office mail and receiving callers. Lectures 4 hours, Laboratory 12 hours, Total 16 hours per week.

SECR 110 PERSONAL TYPING (2 cr.)—A basic course in typing designed to teach the keyboard, simple techniques; emphasis is placed on accuracy, preparation of reports, themes, essays and letters. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

SECR 111 TYPEWRITING I (3 cr.)—Introduction to keyboard with emphasis on good technique and machine mastery, letter format and styles; tabulation and centering; manuscript typing. Electric typewriters are used for training. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

SECR 112 TYPEWRITING II (3 cr.)—Prerequisite SECR 111 or placement test. Continuation of skill building with increased emphasis on standards required to meet job requirement in production typing. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

SECR 113 TYPEWRITING III (3 cr.)—Prerequisite SECR 112 or placement test. An advanced course in skill development with high standards required to meet job requirements in production typing. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

SECR 121 SHORTHAND I (4 cr.)—ENGL 101 must have been taken previously or must be taken concurrently. Presentation of shorthand principles in Gregg Diamond Jubilee Series with emphasis on basic reading and writing skills, emphasizing associated vocabulary and grammar. Lectures 3 hours, Laboratory 2 hours, Total 5 hours per week.

SECR 122 SHORTHAND II (4 cr.)—Prerequisite SECR 121 or placement test. Reinforcement of shorthand principles, further development of general business vocabularies and English usage. General business dictation. Lectures 3 hours, Laboratory 2 hours, Total 5 hours per week.

SECR 123 SHORTHAND III (4 cr.)—Prerequisite SECR 122 or placement test. Increased speed in general business dictation. Introduction of specialized business dictation with emphasis on vocabularies. Lectures 3 hours, Laboratory 2 hours, Total 5 hours per week.

SECR 136 FILING AND RECORDS MANAGEMENT (2 cr.)—A comprehensive course covering indexing principles, filing procedures and techniques as applied to basic systems of filing; establishment of filing systems; selection of equipment and supplies; survey of systems using electronics and microfilm; solution of records management problems. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

SECR 216 EXECUTIVE TYPING (2 cr.)—Prerequisite SECR 113 or placement test. Introduction to proportional-spacing typing with emphasis on quality work in letters, statistical materials, and justified copy. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

SECR 217 TYPEWRITER SKILL BUILDING (2 cr.)—Prerequisite SECR 113. Further development of speed and accuracy on production typing with emphasis on employment standards. Preparation for employers' secretarial placement examinations. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

SECR 221 SHORTHAND TRANSCRIPTION I (3 cr.)—Prerequisite SECR 216 (or concurrent enrollment). Rapid review of fundamental principles of Gregg Shorthand, Diamond Jubilee Series, development of vocabulary and phrases. Speed building on general business dictation and transcription. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

SECR 222 SHORTHAND TRANSCRIPTION II (3 cr.)—Prerequisite SECR 221 or placement test. Continuation of speed building with emphasis on particular areas of general business, developing special vocabularies, phrases, and shortcuts. Emphasis on spelling, grammar, and other transcription skills. Lecture 1 hour, Laboratory 4 hours, Total 5 hours per week.

SECR 241 SECRETARIAL PROCEDURES I (3 cr.)—Corequisite SECR 216. Development of skills in operation of stencil and spirit duplicating machines. Preparation of copy for reproduction by offset, stencil, and spirit process. Criteria for selecting a duplicating process. In-depth study of type styles, paper, typewriter ribbons, and carbon paper. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 242 SECRETARIAL PROCEDURES II (3 cr.)—Prerequisite SECR 241. Emphasis on the secretary's routine office responsibilities, including mail handling, communications services, telephone techniques, and the use of reference materials. Emphasis is placed on application of skills gained in typewriting and shorthand. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 243 SECRETARIAL PROCEDURES III (3 cr.)—Prerequisite SECR 242. Continued emphasis on the secretary's office responsibilities, including handling of banking transactions, maintaining records on securities transactions, travel arrangements, planning of office layouts, and personnel policies. Machine transcription is included. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

## SOCIOLOGY

SOCI 101-102-103 INTRODUCTORY SOCIOLOGY I-II-III (3 cr.) (3 cr.) (3 cr.)—The fundamental concepts and the general principles of sociology; social institutions, population study, human ecology and community study, culture, human nature and personality, social interaction and stratification, and social problems. Lectures 3 hours per week.

SOCI 186 SOCIAL PROBLEMS (3 cr.)—A study of selected contemporary social problems usually including such problems as divorce, alcoholism, drug addiction, minority problems, juvenile delinquency, and old age. Lectures 3 hours per week.

SOCI 230 MARRIAGE AND THE FAMILY (3 cr.)—A study of comparative family systems and problems related to marriage and the family. Lecture 3 hours per week.

SOCI 240 INTRODUCTORY ANTHROPOLOGY (3 cr.)—A study of the origin and evolution of man based upon the fossil record, and an analysis of the status of modern racial groupings. Lectures 3 hours per week.

SOCI 276 CRIMINOLOGY (3 cr.)—Volume and scope of crime; the background of criminal behavior in the American setting; organized crime and its affiliated problems, subjective theories and explanation of crime. The control, treatment, and rehabilitation of the criminal offender. Lectures 3 hours per week.

## SOCIAL SCIENCES

SOSC 161-162-163 AMERICAN CIVILIZATION I-II-III (3 cr.) (3 cr.) (3 cr.)—An analysis of the factors involved in the development of the American Society and American Culture. Course materials will be presented in an integrated pattern to develop an understanding of American history, American government, American economics, and man's role in society. Lectures 3 hours per week.

## SPANISH

SPAN 101-102-103 ELEMENTARY SPANISH I-II-III (4 cr.) (4 cr.) (4 cr.)—Introductory training in the speaking, understanding, reading, and writing of Spanish. Lectures 3 hours, Laboratory and drill 2 hours, Total 5 hours per week.

SPAN 201-202-203 INTERMEDIATE SPANISH I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite Spanish 103 or successful completion of two years of high school Spanish. Training in the speaking, understanding, reading, and writing of Spanish. Spanish is used in the classroom. Lectures 3 hours, Laboratory and drill 2 hours, Total 5 hours per week.

SPAN 231-232-233 SURVEY OF SPANISH LITERATURE AND CIVILIZATION I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite SPAN 203 or equivalent. An introduction to the background of Spanish life and culture and to the outstanding contributions of Spain to world civilization from medieval times to the present.

Readings in the original Spanish. Spanish is used in the classroom. Lectures 3 hours per week.

### **SPEECH-DRAMA**

**SP-DRAM 106 INTRODUCTION TO THE THEATRE (3 cr.)**—The basic principles of theatre. The background of modern drama, play analysis, types of theatrical production, and a comparison of the stage with motion pictures, radio and television as dramatic media. Lectures 3 hours per week.

**SP-DRAM 108 HISTORY OF THE THEATRE (3 cr.)**—The history of the theatre as an art form in relation to the development of Western culture from ancient times to the present. Lectures 3 hours per week.

**SP-DRAM 117 FUNDAMENTALS OF PLAY PRODUCTION (3 cr.)**—The materials and techniques of play production with particular reference to the stage, but including a consideration of the methods of dramatic production involved in motion pictures, radio, and television. Lectures 3 hours per week.

**SP-DRAM 136 SPEECH COMMUNICATIONS (3 cr.)**—Proficiency in oral communication is developed through the learning of the basic forms, uses, and techniques of speech. Emphasis on the practical aspects of speech writing, listening, and oral presentation. Lectures 3 hours per week.

**SP-DRAM 137 PUBLIC SPEAKING (3 cr.)**—Development of skill in speech-making, with emphasis upon expository speaking for an introduction to persuasive speaking. Logical analysis and the use of evidence; organization and phrasing of the speech; development of effective control of voice and action. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

**SP-DRAM 138 PERSUASIVE SPEAKING (3 cr.)**—Prerequisite SP-DRAM 137. A continuation of SP-DRAM 137 with emphasis upon persuasive speaking. Logical and psychological factors in speech organization and composition; methods of audience analysis; forms of public discussions; discussion groups; the debate; analysis of contemporary speeches. Continued practice in speaking before the class. Lectures 3 hours per week.

**SP-DRAM 139 COMMUNICATION (3 cr.)**—The principles and techniques of oral communication in the light of classical and modern rhetorical theory. Analysis of a variety of prose and poetry types for comprehension of the author's content and attitude. Special attention to improvement of vocabulary. Some emphasis on vividness and directness. An interpretation of meaning in a variety of live audience situations. Lectures 3 hours per week.

### **WELDING**

**WELD 026 INTRODUCTION TO WELDING (1 cr.)**—Instruction is given in the setup and safe operation of oxyacetylene and electric welding equipment. A study of the correct methods for welding various metals, such as cast iron and steel, and the techniques for brazing are made. Laboratory 3 hours per week.



## NOTES