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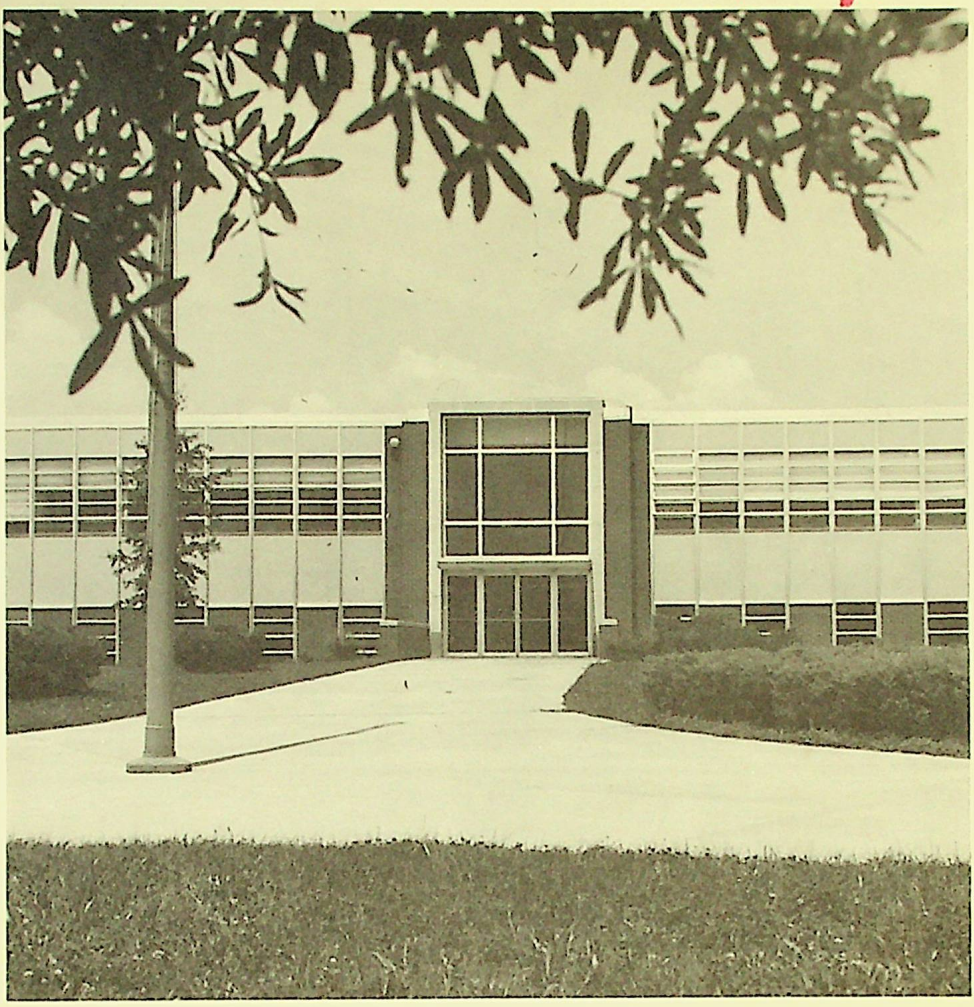

VIRGINIA WESTERN COMMUNITY COLLEGE

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ROANOKE, VIRGINIA

CATALOG 1967-1968

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CATALOG

VIRGINIA WESTERN COMMUNITY COLLEGE

3098 Colonial Avenue, S.W.
Roanoke, Virginia 24015
Telephone 342-7851

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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 Bedford County, Botetourt County, Floyd County, Franklin County, Montgomery County, and Roanoke County particularly. The areas covered have a population of approximately 250,000 people, 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 jurisdictions, individuals and businesses.

HISTORY

Virginia Western Community College was authorized by the State Legislature in February 1966, as a Division of the state-wide Community College System. It is located on approximately 70 acres provided by the City of Roanoke for the use of higher education in the Roanoke Valley. The College is made up of two major components. A division of Arts and Sciences involves all of the regular college transfer programs with courses leading to the first two years of work toward the various baccalaureate degrees. This program follows closely the program of the Roanoke Center of the University of Virginia which has operated in the City of Roanoke since 1927 under the direction and supervision of the University.

The second component of the College is the division of Occupational and Technical Education. This program involves the work previously offered in Roanoke by the Roanoke Technical Institute and supervised by Virginia Polytechnic Institute.

This program was authorized by the Legislature in 1958, and started operating in 1960 at the Colonial Avenue location.

The campus is located at 3098 Colonial Avenue, S. W., near the city limits of Roanoke. The first class of the technical program was admitted in 1961.

PURPOSE

Virginia Western Community College is dedicated to the belief that each individual should be given continuing opportunity for the development and extension of his skills and knowledge along with an opportunity to increase in 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 its region through a cooperative effort with local industry, business, professions, and government.

Educational opportunities are provided for post high school age youth and adults. These include 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.

1. **Occupational-Technical Education.** The occupational and technical education programs are designed to meet the increasing demand for technicians, semi-professional workers, and skilled craftsmen for employment in industry, business, the professions, and government. The cur-

riculums 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 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 an occupational-technical curriculum and to the university parallel-college transfer curriculum in the Community College. These programs are designed to help the individual develop the basic skills and understandings necessary to succeed in other community college programs.
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, a division of the Virginia Community College System is approved by the State Board for Community Colleges and by the State Department of Community Colleges in Virginia. The Associate Degree curriculums of the College have also been approved by the State Council of Higher Education for Virginia. The College has established contact with the Southern Association of Colleges and Schools and has declared its intention to work closely with the Association in pursuit of full accreditation and membership at the earliest possible date.

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Fall—1967

Orientation Day for New Students	September 27
Registration	September 28-29
Classes Begin	October 2
Last Day to Add or Change Classes	October 6
Last Day for Withdrawal Without Penalty	October 20
Mid-term Grade Reports	November 7
Thanksgiving Recess	November 23-25
Classes End	December 13
Final Exams	December 14-16

Winter—1968

Orientation Day for New Students	January 3
Registration	January 4-5
Classes Begin	January 8
Last Day to Add or Change Classes	January 12
Last Day for Withdrawal Without Penalty	January 26
Mid-term Grade Reports	February 13
Washington's Birthday	February 22
Classes End	March 19
Final Exams	March 20-22

Spring—1968

Orientation Day for New Students	March 27
Registration	March 28-29
Classes Begin	April 1
Last Day to Add or Change Classes	April 5
Last Day for Withdrawal Without Penalty	April 19
Mid-term Grade Reports	May 7
Memorial Day	May 30
Classes End	June 10
Final Exams	June 11-13
Graduation	June 15

COLLEGE CALENDAR

Summer—1968

(Two five-week terms with double class Periods)

First Term

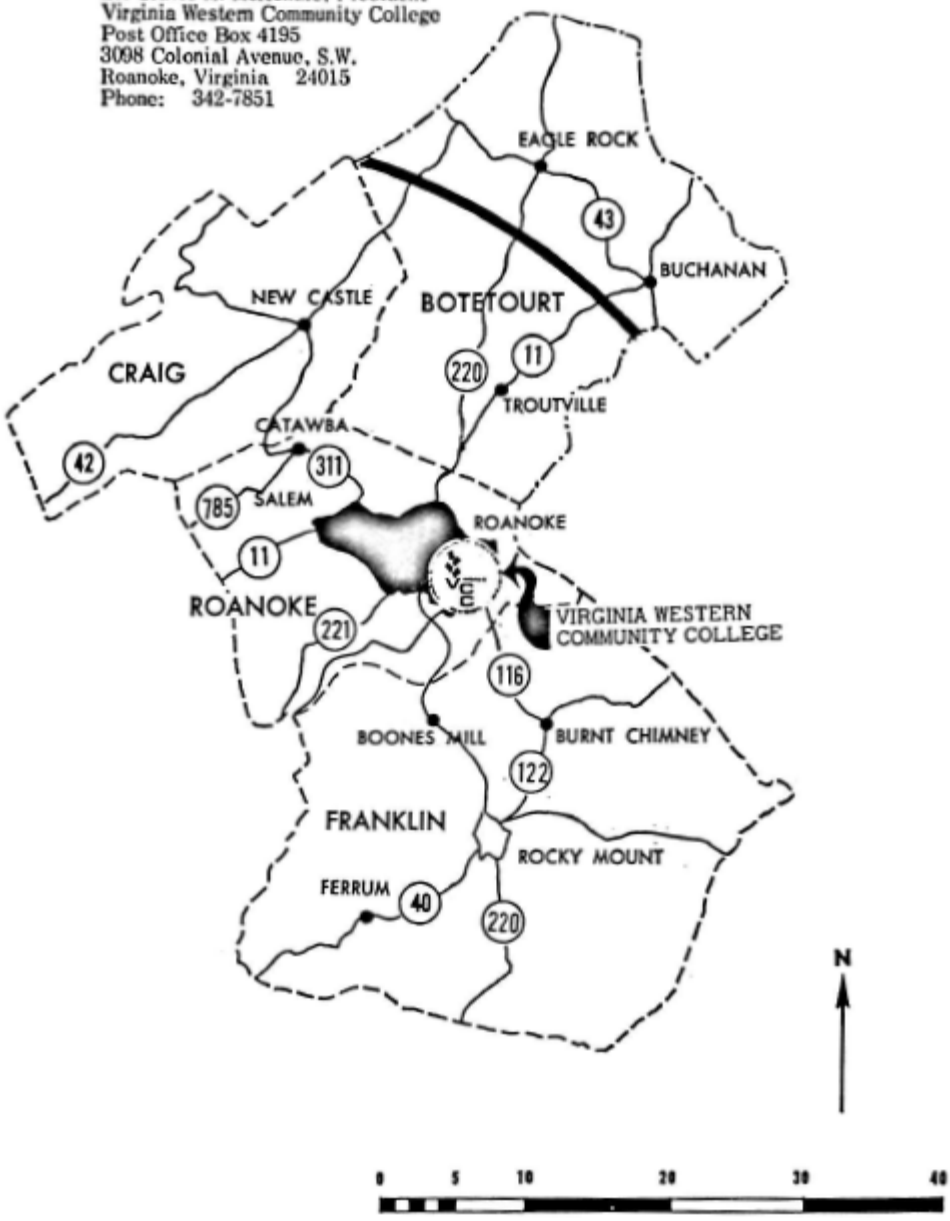
Orientation Day for All Students	June 17
Registration	June 18
Classes Begin	June 19
Last Day to Add or Change Classes	June 21
Last Day for Withdrawal Without Penalty	June 28
Independence Day	July 4
Mid-term Grade Reports	July 9
Classes End	July 24
Final Exams	July 25-26

Second Term

Orientation Day for All Students	July 29
Registration	July 30
Classes Begin	July 31
Last Day to Add or Change Classes	August 2
Last Day for Withdrawal Without Penalty	August 9
Mid-term Grade Reports	August 19
Labor Day	September 2
Classes End	September 4
Final Exams	September 5-6

ROANOKE AREA

Dr. Travis M. McKenzie, President
Virginia Western Community College
Post Office Box 4195
3098 Colonial Avenue, S.W.
Roanoke, Virginia 24015
Phone: 342-7851



STATE BOARD FOR COMMUNITY COLLEGES

Eugene B. Sydnor, Jr., Chairman

Thomas R. Glass, Vice Chairman

Mrs. Mary Anne Franklin
Mrs. John Galleher
William S. Hoofnagle
William P. Kanto
Thomas J. Lennon
Daniel C. Lewis
S. E. Liles, Jr.
John D. Meade
Benjamin W. Mears, Jr.
W. Wirt Shapard
D. Boyd Thomas
Henry W. Tulloch
Gordon C. Willis

STATE DEPARTMENT OF COMMUNITY COLLEGES

Dana B. Hamel, Director

VIRGINIA WESTERN COMMUNITY COLLEGE

ADVISORY BOARD

Four Year Term

W. S. Russell, Chairman
(342-4697)
Route 4, Box 60
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)
109 Claiborne Avenue, N. W.
Rocky Mount, Virginia 24151

Three Year Term

Henry E. Thomas, Vice Chairman
Administrative Vice President
Shenandoah Life Insurance
Company
Roanoke, Virginia 24015
(344-5571)

Paul R. Thomson, Manager
(389-7011)
Employee and Community
Relations
General Electric Company
Salem, Virginia 24153

W. Darnall Vinyard (343-5120)
Vinyard Brothers Dairy
Vinton, Virginia 24179

Two Year Term

R. F. Dunlap (344-1451)
Vice President-Operations
Norfolk and Western Railway
Company
Roanoke, Virginia 24016

Mrs. Hunter Painter (343-2439):
Wm. Byrd H. S.
Fincastle, Virginia 24090

Basil Watkins (864-2301)
Superintendent of Schools
Craig County
New Castle, Virginia 24127

PRESIDENT

Travis M. McKenzie

ADMINISTRATION

Travis M. McKenzie — Professor, President
B.S.—Texas A. & M. University
M.S.—Texas A. & M. University
Ph.D.—University of Texas

James N. McCabe — Business Manager
A.B.—West Virginia University

Harry C. Race — Assoc. Professor, Chairman, Engineering Technology Division
B.S.E.E.—Northeastern University
M.S.—Radford College

Samuel R. Crockett — Assoc. Professor, Chairman, Arts and Sciences Division
A.B.—Roanoke College
M.A.—Michigan State
Litts.D.—Also additional work at William and Mary, Furman University, and the University of Virginia

Richard F. Lancaster — Instructor, Coordinator of Library Services
B.A.—Roanoke College
M.S.L.S.—University of North Carolina

W. Marshall Denison — Asst. Professor, Director of Student Services
B.S.—Roanoke College
M.S.—Radford College
additional work at the University of Virginia

Guidance Department:

P. Joseph Giampocaro — Instructor, Counselor
B.S.—Virginia Polytechnic Institute
M.S.—Radford College

David P. James, Jr. — Instructor, Counselor
B.S.—Virginia Polytechnic Institute
Additional work at Radford College toward Master's degree

Margaret F. Kirksey (Miss) — Asst. Professor, Counselor
B.A.—University of Texas
M.A.—University of Texas

Maurice Strausbaugh — Asst. Professor, Counselor
B.A.—Juanita College
B.D.—Bethany Theological Scohol
M.Ed.—The Johns Hopkins University

(** To join Staff September 15, 1967—* Left Staff July 1, 1967)

Full-Time Faculty:

**Sally J. Abernethy (Miss) B.A.—Agnes Scott College M.A.—University of Virginia	Instructorr Histoy
Jesse B. Aird, III A.A.S.—Mechanical Engr. Roanoke Technical Institute	Asst. Instructor of Engineering Technology
Edward L. Beale B.S.C.E.—Virginia Polytechnic Institute M.S.C.E.—Virginia Polytechnic Institute	Asst. Professor Civil Engineering Technology
T. Franklin Belvin B.S.—Virginia Polytechnic Institute additional work at V.P.I. toward Master's degree	Instructor Economics
Bruce E. Biel B.A.—Dickinson College M.A.—University of Pennsylvania	Instructor English
**Albert A. Blomberg Associate of Science—Boston University College of Industrial Technology Certificate—New England Aircraft School	Automotive Technology
*Charles Brenneman B.S.E.E.—Virginia Polytechnic Institute	Instructor Electrical Engineering Technology
**Richard I. Broughton B.A.—Florida State University M.A.—Florida State University	Instructor English and Speech
Joseph W. Cohron A.B.—College of William and Mary A.M.—Ohio University additional work at University of Denver and University of Michigan	Asst. Professor Speech & Drama
Betty C. Craig (Mrs.) A.B.—Hollins College	Instructor English
A. Eugene Crotty B.C.S.—National Business College B.S.—University of Virginia M.B.A.—University of Virginia Certified Public Accountant—Virginia	Assoc. Professor Business Administration

Earle S. Davis — Instructor
B.S.—U. S. Naval Academy — Mathematics

Marjorie S. Durling (Mrs.) — Instructor
B.S.—West Virginia University — English
M.A.—West Virginia University

**John S. Felton — Instructor
B.S.C.E.—Virginia Polytechnic Institute — Civil Technology

Ray A. Gaskins — Instructor in Mathematics
B.S.—Virginia Polytechnic Institute
Doctoral Candidate—Virginia Polytechnic Institute

*Margarita R. Gaston (Mrs.) — Spanish (Substitute)
Studied at Mount St. Mary's New Hampshire
and Barnard College, New Hampshire
Certificate for teaching Spanish from V.P.I.

**Mignonne Griggs (Miss) — Asst. Professor
B.S.—Longwood College — Reading
M.Ed.—Virginia Polytechnic Institute
additional work at Boston University

Charles J. Headland — Asst. Professor of
B.S.—State Teachers College, — Technical Mathematics
Slippery Rock, Pennsylvania
M.Ed.—University of Pittsburgh

*Frances B. Hendricks (Mrs.) — Instructor
B.S.—Carson-Newman College — English
M.A.—Columbia University

James P. Hill, Jr. — Asst. Professor
B.S.—Roanoke College — Chemistry
M.Ed.S.—University of Virginia
Additional work at the University of Virginia
and at Clemson University

William E. Hoffman, Jr. — Asst. Instructor
A.A.S.—Roanoke Technical Institute — Electrical Technology

James A. Hooven — Instructor of History
B.A.—New Mexico Highlands University
M.A.—New Mexico Highlands University

E. Burwell Ilyus — Instructor
E.E.—Lehigh University; P.E. — Mathematics

Donald C. Kunze — Assoc. Professor, Biology
B.S.—Baldwin-Wallace College
M.A.—Kent State University
Additional work in field

*Gee-Yin Kwok — Instructor, Mathematics
B.S.—Wake Forest College
M.A.—Wake Forest College
Advanced Graduate work at V.P.I.

William Wei-Lim Lee (on leave) — Assoc. Professor, Mechanical Engineering Technology
B.S.—National Taiwan University
M.S.—Virginia Polytechnic Institute
Doctoral Candidate—V.P.I.

*Robert A. Lemon — Asst. Professor, Civil Engineering Technology
B.S.C.E.—Virginia Polytechnic Institute
M.S.C.E.—Virginia Polytechnic Institute

Edith P. Martin — Instructor, Arts
B.A.—Washington State University
M.F.A.—Pennsylvania State University

Carole F. Massart (Mrs.) — Instructor, Biology
B.A.—College of Wooster
M.Ed.—University of Virginia

Gallais E. Matheny — Assoc. Professor, Biology
B.S.—University of Illinois
M.S.—Virginia Polytechnic Institute
Additional Graduate work at the University of Virginia

**Clarence C. Mays, Jr. — Instructor, Spanish
B.S.—University of Virginia
M.Ed.—University of Virginia

Rosalind L. McFarland (Mrs.) — Instructor, Mathematics
A.B.—Radcliffe College
Additional work at Roanoke College
and the University of Virginia

Charles E. McSurdy — Instructor, Mathematics
B.S.—Virginia Polytechnic Institute
Master's Degree Candidate—Radford College

Kathryn S. McSurdy (Mrs.) — Instructor, English
B.A.—Radford College
M.S.—Radford College

Wayne R. Michie — Asst. Instructor, Physics Lab
A.A.S.—Roanoke Technical Institute

Roy G. Miles — Assistant Professor
B.S.—Missouri School of Mines — Geology
M.S.—Northeastern University

**Ralph G. Myers — Instructor
A.B.—Bridgewater College — English
M.A.—University of Virginia
Additional work in field

James E. Nelson — Asst. Professor
B.S.—U. S. Merchant Marine Academy — Mechanical Engineering
B.S.—Roanoke College — Technology
M.A.—Appalachian State Teachers College

Edward C. Nininger — Asst. Professor
B.A.—University of Richmond — History
M.A.—University of Richmond
Adv. Doctoral work at the University of Virginia

*L. Thomas Overby — Asst. Professor
B.S.E.E.—Virginia Polytechnic Institute — Electrical Engineering
M.E.E.—Pennsylvania State University — Technology

Hugh B. Phelps — Assoc. Professor
B. of M.E.—Clarkson College — Mechanical Engineering
M. of M.E.—Clarkson College — Technology

J. Carl Poindexter — Professor
B.S.—University of Virginia — Economics
M.A.—University of Virginia
Ph.D.—University of Virginia

William R. Ricketts, Jr. — Asst. Professor
B.S.M.E.—Virginia Polytechnic Institute — Mechanical Technology
Graduate Student—Florida State University

Mary K. Sanders — Professor
A.B.—Coker College — English
M.A.—University of South Carolina
Doctoral Candidate (Summer '67) University of North Carolina

Jean M. Saunders — Instructor of Business
B.S.—Radford College — Technology
M.Ed.—Virginia Polytechnic Institute

**William A. Sar — Instructor
B.A.—Bridgewater College — Physics
M.S.—Clemson University

James C. Sears — Asst. Instructor, Physics Lab
A.A.S.—Roanoke Technical Institute

Edwin V. Selander — Instructor, Mathematics
B.S.—Virginia Polytechnic Institute
Additional work toward Master's degee at V.P.I.

**Milton S. Smith — Professor, English
B.A.—Wesleyan University
M.A.—Harvard University
Ph.D.—Fordham University

**Woody R. Smith — Instructor, Electrical Technology
B.S.—Roanoke College
Additional work toward Master's degree—
University of Pennsylvania

Anna W. Stant (Miss) — Instructor, French
A.B.—Randolph-Macon Woman's College
A.M.—Columbia University
Diploma—University of Grenoble—France

Albert W. Stewart — Asst. Professor, Electrical Technology
B.S.E.E.—Virginia Polytechnic Institute
additional work toward Master's degree—V.P.I.

**John L. Thompson — Asst. Instructor, English
B.A.—Roanoke College
additional work at Columbia University
and Virginia Polytechnic Institute

Millard C. Townsend — Instructor, Business Management
A.B.—Mercer University
1 year Law School—Mercer University

Laverne L. Trahin (Mrs.) — Instructor, Psychology
B.A.—Radford College
M.S.—Radford College

Roy P. Turner — Asst. Professor of Biology
B.S.—Sam Houston State College
M.A.—Sam Houston State College

W. Barry Vinson — Instructor, Sociology
B.S.—East Texas State University
M.S.—East Texas State University

**Lilburn E. Ward, Jr. — Instructor, Chemistry
B.S.—Virginia Polytechnic Institute
M.S.—Virginia Polytechnic Institute

Barbara H. White (Miss) — Instructor, English
A.B.—Longwood College
M.S.—Radford College

**Roy R. White — Assoc. Professor, History and Government
B.S.—Florida Southern College
M.A.—University of Florida
Ph.D.—University of Florida

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B.S.—University of Louisville
L.L.B.—University of Chicago
M.Ed.—University of Virginia

**James H. Wilson — Asst. Instructor, Mechanical Technology
A.A.S.—Roanoke Technical Institute

Benjamin F. Zirkle, III — Instructor, Mathematics
B.S.—Roanoke College
Master's Degree Candidate (June '67)—Florida State University

PART-TIME FACULTY:

Ralph E. Bice — Mathematics
B.S.C.E.—University of Alabama

Norman F. Bull — Mathematics
B.S.E.E.—University of Colorado

William R. Carew, Jr. — Electrical Engineering Technology
B.S.—Loyola College
M.S.—Clemson University

W. Curtis Conner — Mathematics
B.S.—Roanoke College

R. Kent Davis — Physics
B.S.—Lehigh University

Charles B. Farrelly — Decorating
B.F.A.—University of Notre Dame

Lawrence P. Farren — Electrical Technology
B.S.E.E.—University of Massachusetts

John R. Graybill — History
B.A.—Roanoke College
M.Ed.—Virginia Polytechnic Institute
Additional work—George Peabody College

Ruth V. Hamilton (Mrs.) — Arts
B.A.—Ohio State University
M.A.—Ohio State University

Leigh B. Hanes, Jr. — Police Science Technology
B.A.—Hampden-Sydney College
L.L.B.—University of Maryland
Additional work in Field

Thomas B. Hawkins, Jr. — Engineering Technology
A.A.—Wilmington College
B.S.I.E.—North Carolina State College

Edward G. Hayes — Electrical Technology
B.S.E.E.—Virginia Polytechnic Institute

Neil B. Hermansdorfer — Engineering Technology
B.S.E.E.—Lehigh University

Edwin C. Hollenbach — Engineering Technology
B.S.—Virginia Polytechnic Institute

W. Courtney King, Jr. — Business Law
B.A.—Roanoke College
M.A.—University of North Carolina
L.L.B.—Washington and Lee University

Donald E. Klein — Mathematics
B.S.—Southern Methodist University

Jean G. Lawhorn (Mrs.) — Nutrition
B.S.—Madison College
Additional work at V.P.I.
and University of Florida Extension

Richard L. Lawrence — Business Law
B.A.—Roanoke College
L.L.B.—Washington and Lee University

J. Lynn Lubker — Psychology
B.A.—State University of Iowa
M.A.—Southern Methodist University
Ph.D.—University of Kentucky

John R. McMichael — Transportation & Traffic Management
B.A.—University of Pittsburgh

Kathryn W. Minnich (Mrs.) — Mathematics
A.B.—University of Cincinnati
Additional work at the University of Virginia

James E. Pederson — Sociology
B.A.—Lynchburg College
Additional work at Madison College, Radford College and Roanoke College

Robert G. Petteruti — Mathematics
B.A.—Boston University
M.A.T.—University of Virginia

Hartwell Philips — Mathematics
B.I.A.—North Carolina State College
M.Ed.—University of Virginia

Jack V. Place — Business Administration
B.A.—College of William and Mary
B.C.L.—College of William and Mary
M.L. & T.—College of William and Mary

Robert C. Roberts — Mathematics
B.S.E.E.—University of Kentucky
M.S.E.E.—University of Kentucky

Sammy A. Scott (Miss) — Mathematics
B.S.—Longwood College
M.Ed.—Duke University

Patrick N. Shaffner — Engineering Technology
B.S.—Virginia Polytechnic Institute

Madelyn R. Singer (Mrs.) — Mathematics
A.B.—Brooklyn College
M.A.—Columbia University

John L. Thompson — English
B.A.—Roanoke College
Additional work at Columbia University and Virginia Polytechnic Institute

Eleanor Tiplady (Miss) — Music
B.Mus.—Cincinnati Conservatory of Music
M.Mus.—Cincinnati Conservatory of Music

Thomas G. VanNorstrand — Mathematics
B.S.E.E.—Union College

Lilburn E. Ward, Jr. — Mathematics
B.S.—Virginia Polytechnic Institute
M.S.—Virginia Polytechnic Institute

Ronald L. Webster — Psychology
A.B.—University of Maine
A.M.—Louisiana State University
Ph.D.—Louisiana State University

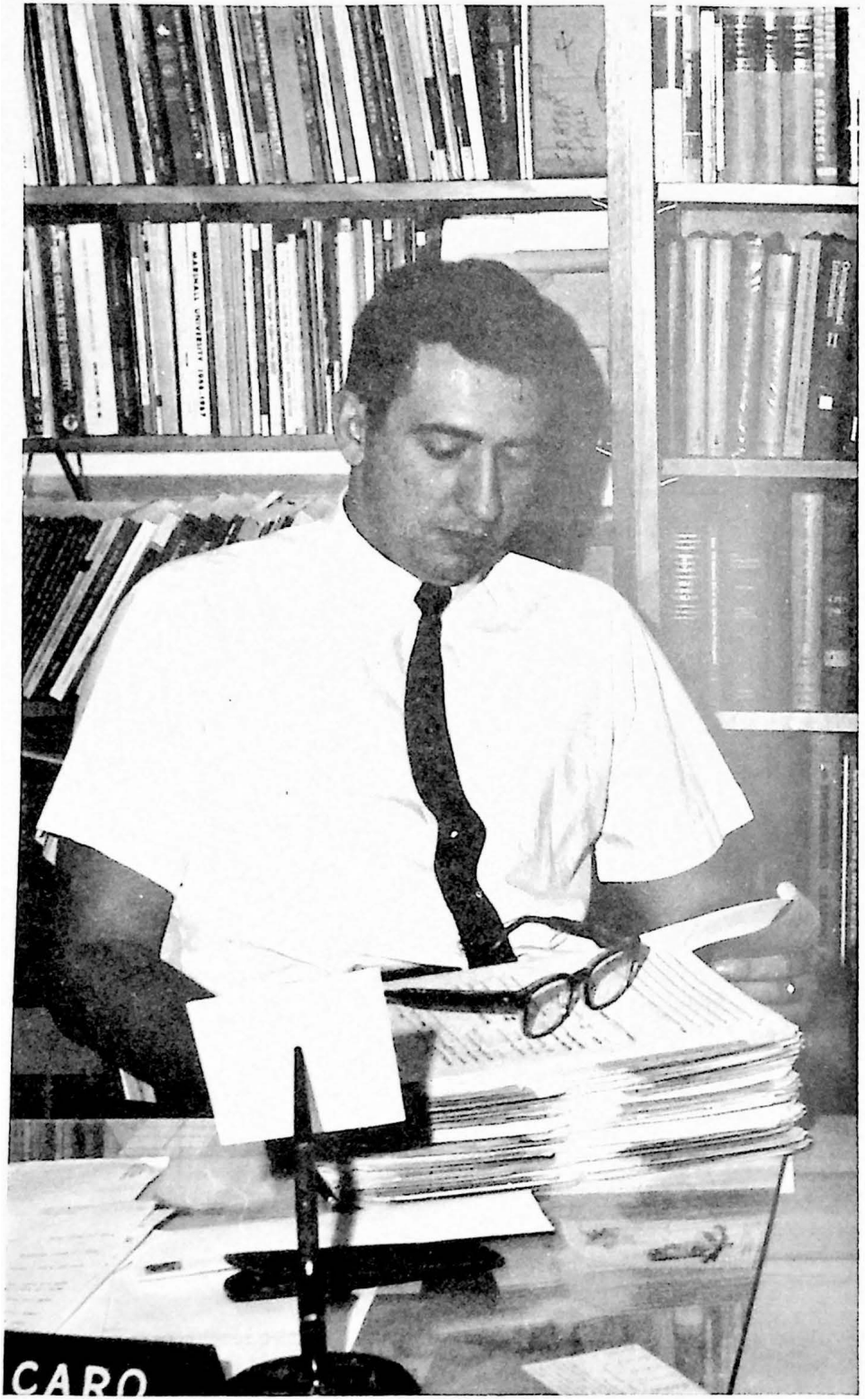
Roy R. White — Government
B.S.—Florida Southern College
M.A.—University of Florida
Ph.D.—University of Florida

Stuart W. Williams — History
B.S.—Madison College
M.Ed.—Virginia Polytechnic Institute

James H. Wilson — Mechanical Tech. Lab.
A.A.S.—Roanoke Technical Institute

Peter Wreden — Arts
Studied at Beaux Arts—Paris, France

James M. Yeatts — Arts
B.S.—University of Virginia
M.F.A.—Princeton University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ADMINISTRATIVE INFORMATION

ADMISSION REQUIREMENTS

General Admissions to the College

Any person who has a high school diploma or the equivalent, or 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 following items have been received by the Office of Admissions.

For all regular students, the following items are required:

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.

For all special students, the following item is required:

1. 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).

Admission to Specific Curriculums

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. Persons 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 pro-

gram 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-time and part-time student working toward completion of an associate degree, diploma, or certificate program;

(2) A full-time and 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 regular 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 an automatic 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, refunds will be pro-rated 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. Usually, one

credit for a course is given for approximately three hours of work weekly by each student as follows:

(a) One hour of lecture plus an average of two hours of out-of-class study, or

(b) Two hours of laboratory or shop work plus an average of one hour of out-of-class study, or

(c) Three hours of laboratory or shop work with no regular out-of-class assignments.

GRADING SYSTEM

A = **Excellent** = Four 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** = O 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; i.e., sickness verified by medical statement, accident verified by police records, etc. or absence from final examination for a verifiable and unavoidable reason. An "incomplete" must be made up during the next term fol-

lowing 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

Virginia Western 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:

(1) Have fulfilled all of the course requirements of his particular curriculum;

(2) Have been recommended for graduation by the major department in the student's curriculum for graduation;

(3) Have completed at least 97 credits applicable to an associate degree of which 45 credits must be acquired at the College;

(4) Have completed the general education requirements course work in economics, English, government, orientation, and psychology) for an associate degree;

(5) Have 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) Have filed an application for graduation in the Office of the Admissions and Records;

(7) Have resolved all financial obligations to the College and returned all materials including library books.

SCHOLASTIC REGULATIONS

Attendance

Registration in a course presupposes that regularly scheduled classes and laboratory sessions will be attended. When absences from a class become 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 grant-

ing 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, effect 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 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, otherwise, he will receive an "F". After that time the student must accept a failing grade of "F". 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.

(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.

Student Conduct

Each student will be expected to conduct himself as a mature adult on campus and in the community, and he will be

held responsible for his acts as a student citizen. The College places responsibility for student conduct largely with the students. Rules and regulations governing student conduct usually are developed by representatives of the students, faculty, counseling staff, and administration.

Cleanliness and appropriate dress are ways in which a student gives evidence of his self-esteem and concern for others. Any student who appears in bizarre attire or consistently violates accepted standards of appearance is subject to disciplinary action.

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 admission can be granted. The words "Disciplinary Probation" or "Disciplinary Dismissal" will appear on the student's permanent record unless recommendation for removal is made by the committee.

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

A 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 statement, "Placed on Academic Suspension" will be placed on the student's permanent record. The student must apply for readmission under all circumstances of academic suspension.

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 academically dismissed from that curriculum. Academic dismissal normally is permanent from that particular curriculum unless with good cause the student reapplies, and is accepted under special consideration, for readmission by the Admissions Committee of the College. The words "Placed on Academic Dismissal" will be placed on the student's permanent record.

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 normal academic load for students is 15-17 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 must usually have a 3.0 average or higher and must have the approval of the Dean and the student's faculty advisor or counselor.

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STUDENT SERVICES

COUNSELING

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

The counseling department 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 services provide individual attention and supplementation to the instructional program of the College.

TESTING

A well-planned testing program for all students is coordinated by the Counseling Department. The ACT test battery of the American College Testing Program 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 prior to registration. In addition, all students who plan to transfer to a four-year college or university will be required to submit their scores on the College Board Scholastic Aptitude Test (SAT) of the College Entrance Examination Board.

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 Center. 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 meet with a counselor at the College for an interview to discuss the student's educational interests, to determine what additional tests he may need, and to plan the student's application for admission to a specific curriculum at the College. The student will also meet with a faculty advisor in his major curriculum to plan his program and course of studies.

An orientation day is scheduled for all new students just prior to the registration period for group orientation to the College and a discussion of student services and activities.

Also set aside as part of the orientation program is a day for the administration of appropriate tests. The College Qualifying Test, the ACT, and the Strong Vocational Interest Blank are scheduled for administration for 1967-68.

In addition, an orientation class is provided for the first quarter to aid all students in their personal and academic adjustments.

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.

Students wishing to apply for financial aid may secure application blanks from the office of the Counseling Department.

Scholarships

The Community College participates with the State Teacher's Scholarship, College Service, and National Merit Programs. A separate pamphlet explaining all financial assistance programs is available from the Counseling Department.

Part-Time Employment

A placement office operates throughout the year to assist students in securing part-time employment. 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 according.

Work-Study Program

Numerous jobs on campus are available each year under the Work-Study Program. Full-time students between the ages of 15 and 21 years who are in financial need may 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 six 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 State Education Assistance Authority, 1010 State-Planters Bldg., 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 has made application to participate in the National Defense Student Loan Program. It is anticipated that these funds will be available during the 1967-68 academic year.

Other scholarship funds or financial aid plans may be added throughout the year. Interested students may inquire through the Counseling Department's Financial Aids Officer.

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.

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

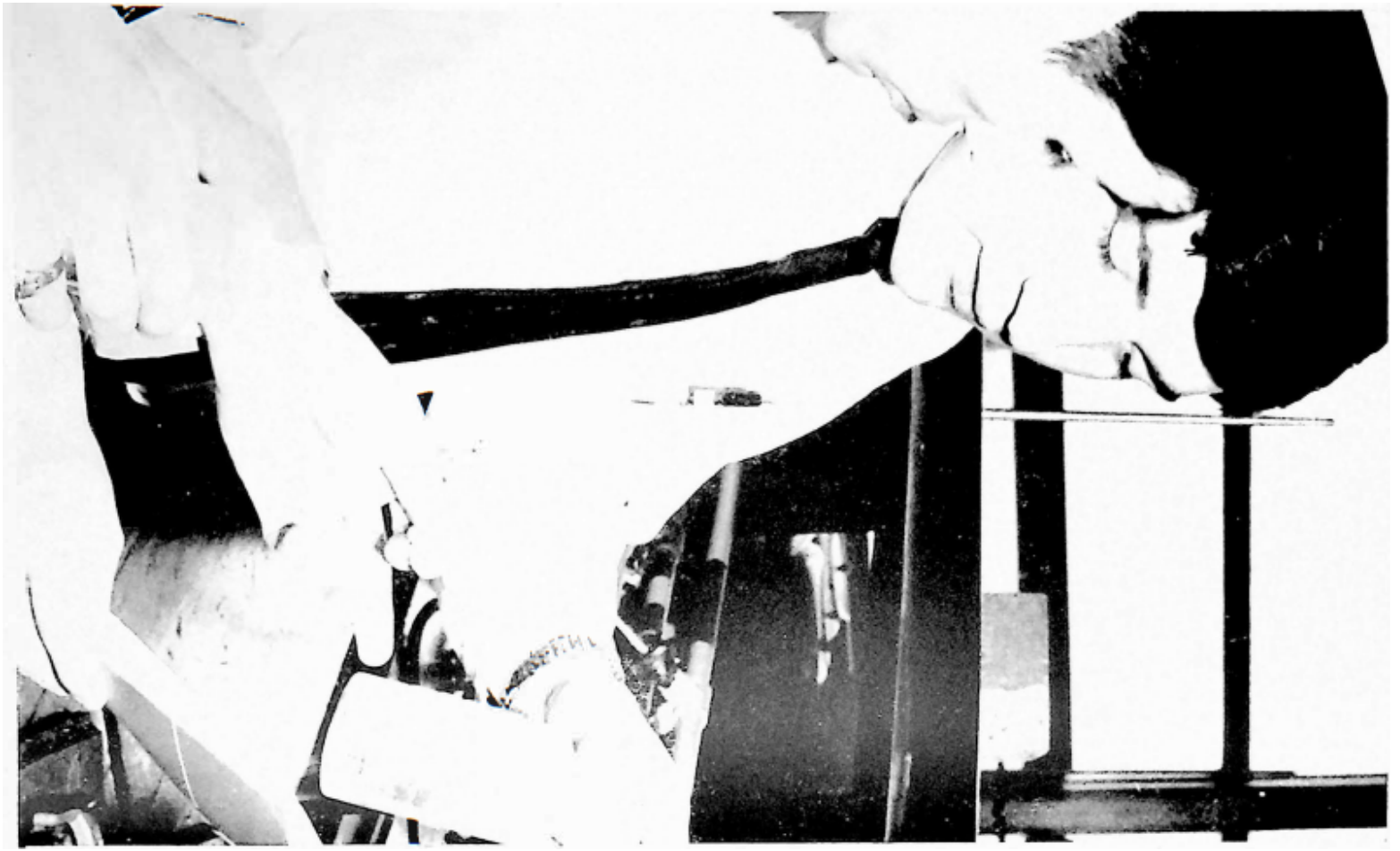
Until further development of the campus, parking will be a problem. Students are urged to follow the regulations with regard to parking in the parking lot as well as on the two sides of Colonial Avenue. It may be necessary to impose fines for illegal parking. Cars parked in a manner endangering the welfare 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.

STUDENT HANDBOOK

A student handbook will be available to provide additional information of interest. The handbook will describe student activities and organizations and will also list the College rules and regulations.



CURRICULUMS

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 Degree

Liberal Arts

Associate in Science Degree

Business Administration
Pre-Engineering
Pre-Teacher Education
Science

Diploma

Automotive Technology

Certificate Curricula

Mechanical Drafting

Other Programs

Developmental Foundation 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 this field 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 these subjects 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 progam in Accounting are similar to the program in Business Management. However, in the second year each student will pursue his special field 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 on the next page, 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 Hou:	Course Credits
	FIRST QUARTER			
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
	Total	14	5	16
	SECOND QUARTER			
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	0	3	1
	Total	15	5	17
	THIRD QUARTER			
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 Re'ations	3	0	3
PHED 102	Health, Phys. Ed., or Recreation	0	3	1
	Total	13	9	17

*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.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FOURTH QUARTER			
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)	3	0	0-3
	Total	16	2	14-17
	FIFTH QUARTER			
BUAD 240	Business Finance	3	0	3
BUAD 241	Business Law I	3	0	3
BAUD 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	0	3	1
	Total	16	3	17
	SIXTH QUARTER			
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)	0	6	2
	Total	14	6	16
	Total Minimum Credits for an Accounting Major			97

ARCHITECTURAL ENGINEERING TECHNOLOGY

48 **Degree:** Associate in Applied Science

Length: Six Quarter (two-year) Program

Purpose: This program trains 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)
Design Detailer
Building Contractor
Building Materials Salesman
Building Inspector
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 on the next page 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
	FIRST QUARTER			
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
	SECOND QUARTER			
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	0	3	1
	Total	14	12	18
	THIRD QUARTER			
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	0	3	1
	Total	14	11	18
	FOURTH QUARTER			
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	3	3	4
	Total	13	15	18
	FIFTH QUARTER			
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	3	0	3
	Total	13	15	18
	SIXTH QUARTER			
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	2	0	2
	Total	16	6	18

*See Notes on Associate in Applied Science degree programs on page 84.

BUSINESS MANAGEMENT

50 **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. The Associate in Applied Science degree program in Business Management is designed primarily for persons who seek full-time employment in business management 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 comp!etion of the six-quarter program listed on the next page, 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

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
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
	Total	14	5	16
	SECOND QUARTER			
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	0	3	1
	Total	15	5	17
	THIRD QUARTER			
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	0	3	1
	Total	13	9	17

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

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FOURTH QUARTER			
BUAD 294	Introduction to Business Statistics	3	0	3
BUAD 277	Purchasing & Materials Mgmt. (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	3	0	3
	Total	15	2	16
	FIFTH QUARTER			
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	0	3	1
	Total	15	3	16
	SIXTH QUARTER			
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	2-3	0	2-3
	Total	13-14	6	15-16
	Total Minimum for a Business Management Major			97

**See Notes on Associate in Applied Science degree programs on page 84.

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 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 this technical knowledge with a sound foundation of mathematics, basic science, and English. This enables the technician to communicate mathematically, scientifically, and orally 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 semi-professional 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 on the next page 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
	FIRST QUARTER			
ENGL 101	Communication Skills	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
	SECOND QUARTER			
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
	THIRD QUARTER			
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
	FOURTH QUARTER			
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	3	0	3
	Total	14	12	18
	FIFTH QUARTER			
CIVL 204	Civil Engineering Technology I	3	3	4
ENGR 153	Mechanics III (Advanced Strength & Motion)	2	3	3
	*Technical Electives	6	6	8
PSYC 128	Human Relations	3	0	3
	Total	14	12	18
	SIXTH QUARTER			
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	2	0	2
	Total	15	9	18

*See Notes on A.A.S. Programs on page 84.

COMMERCIAL ARTS

54 **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

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
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 I	0	3	1
	Total	9	26	18
	FIFTH QUARTER			
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	0	3	1
	Total	9	26	18
	SIXTH QUARTER			
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	2	0	2
	Total	8	29	18

COMMUNICATION TECHNOLOGY

Television and Radio

56 **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

Admissions 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
	FIRST QUARTER			
ARTS 101	General Art I	2	3	3
GENL 100	Orientation	1	1	1
GOVT 180	American Constitutional Government	3	0	3
ENGL 101**	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	0	6	2
	Total	12	16	17
	SECOND QUARTER			
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	0	6	2
	Total	11	15	16
	THIRD QUARTER			
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	0	6	2
	Total	10	17	16
	FOURTH QUARTER			
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	3	3	4
	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	3	3	4
	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	3	0	3
	Total	11	18	17

*See Notes on Associate in Applied Science degree programs on page 84.

**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.

ELECTRICAL ENGINEERING TECHNOLOGY

58 **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 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.

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 on the next page will be awarded the Associate in Applied Science degree with a major in Electrical Engineering Technology. The curriculum requires a minimum of 108 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 electrical engineering technology.

ELECTRICAL ENGINEERING TECHNOLOGY

Associate in Applied Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
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
	SECOND QUARTER			
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
ELEC 111	Electrical Circuits I	4	3	5
ELEC 118	Electrical Shop I	0	3	1
	Total	15	9	18
	THIRD QUARTER			
ENGL 136	Speech Communications	2	2	3
MATH 123	Engineering Technology Mathematics III	5	0	5
PHYS 113	Technical Physics III	3	3	4
DRFT 256	Electronics Drafting	1	3	2
ELEC 112	Electrical Circuits II	3	3	4
	Total	14	11	18
	FOURTH QUARTER			
GOVT 180	American Constitutional Government	3	0	3
ELEC 119	Electrical Shop II	0	3	1
ELEC 201	Electrical Engineering Technology I	5	3	6
	*Technical Option	3	3	4
ELEC 277	Electrical Measurements	3	3	4
	Total	14	12	18
	FIFTH QUARTER			
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	3	0	3
	Total	14	12	18
	SIXTH QUARTER			
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	0	2
	Total	13	12	17

*See Notes on Associate in Applied Science degree program on page 84.

MECHANICAL ENGINEERING TECHNOLOGY

60 **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. 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 this technical knowledge with a sound foundation of mathematics, basic science, and English. This enables the technician to communicate mathematically, scientifically, and orally with the craftsmen 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 semi-professional 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 on the next page will be awarded the Associate in Applied Science degree with a major in Mechanical Engineering Technology. The program required 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
	FIRST QUARTER			
ENGL 101	Communication Skills I	3	0	3
MATH 121	Engineering Technology Mathematics I	5	0	5
DRFT 126	Introduction to Graphic Representation	1	3	2
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	13	13	17
	SECOND QUARTER			
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
MECH 114	Mechanical Engineering Drafting I	1	3	2
INDT 141	Methods of Manufacturing I	2	3	3
PHED 102	Health, Phys. Ed., or Recreation	0	3	1
	Total	14	12	18
	THIRD QUARTER			
ENGL 136	Speech Communications	2	2	3
MATH 123	Engineering Technology Mathematics III	5	0	5
PHYS 113	Technical Physics III	3	3	4
MECH 115	Mechanical Engineering Drafting II	1	3	2
ENGR 151	Mechanics I	3	0	3
PHED 103	Health, Phys. Ed., or Recreation	0	3	1
	Total	14	11	18
	FOURTH QUARTER			
INDT 142	Methods of Manufacturing II	2	3	3
ENGR 152	Mechanics II	3	3	4
MECH 264	Thermodynamics	3	3	4
	*Technical Option	3	3	4
GOVT 180	American Constitutional Government	3	0	3
	Total	14	12	18
	FIFTH QUARTER			
ENGR 153	Mechanics III	2	3	3
MECH 214	Mechanical Engineering Design I	3	3	4
	*Technical Option	3	3	4
PSYC 128	Human Relations	3	0	3
	*Technical Elective	3	3	4
	Total	14	12	18
	SIXTH QUARTER			
MECH 215	Mechanical Engineering Design II	3	3	4
MECH 246	Metallurgy	3	3	4
	*Technical Option	3	3	4
ECON 160	American Economics	3	0	3
MECH 299	Seminar and Project in Mechanical Technology	2	0	2
	Total	14	9	17

*See Notes on Associate in Applied Science degree program on page 84.

POLICE SCIENCE

62 **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.

POLICE SCIENCE

Associate in Applied Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
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 elect.)	3	0	3
GENL 100	Orientation	1	1	1
	Total	16	4	17
	SECOND QUARTER			
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	Psychology of Personal Adjustment (or PSYC ELECTIVE)*	3	0	3
SOCI 102	Introductory Sociology II (or elective)	3	0	3
	Total	15	3	16
	THIRD QUARTER			
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 or PLCE 130	Introductory Sociology III (or elective) Special Enforcement Problems	3	0	3
PHED 101	Health, Phys., or Recreation	0	3	1
	Total	14	8	17
	FOURTH QUARTER			
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	3	1
	Total	15-17	3	16-18
	FIFTH QUARTER			
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
	SIXTH QUARTER			
PLCE 237	Administration of Justice (or PLCE Elective)	3	0	3
PLCE 270	Industrial & Commercial Security (or elect.)*	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)	0-1	0-3	0-2
	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

64 **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.

Admissions Requirements: Satisfactory scores on appropriate sections of the American College Testing (ACT) will be required for admissions 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 on the next page, 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
	FIRST QUARTER			
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
	SECOND QUARTER			
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
	THIRD QUARTER			
SECR 113	Typewriting III	1	4	3
SECR 123	Shorthand III	3	2	4
SECR 136	Filing and Records Management	1	2	2
SECR 156	Personal Development	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
	FOURTH QUARTER			
SECR 216	Executive Typing	1	2	2
SECR 241	Secretarial Procedures 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
	FIFTH QUARTER			
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	Busineses Law I	3	0	3
ECON 226	Industrial Economics	3	0	3
	Elective	—	—	3
	Total	—	—	18
	SIXTH QUARTER			
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	—	—	5
SECR 299	Seminar and Projects in Secretarial Science	2	0	2
	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
Education
English
Foreign Language
Government (Political Science)
History
Humanities
Journalism
Library Science
Literature
Philosophy
Pre-Law
Psychology
Sociology
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 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
2 units of algebra
1 unit of geometry
1 unit of laboratory science
1 unit of history

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 on the next page, 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
	FIRST QUARTER			
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
	SECOND QUARTER			
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
	THIRD QUARTER			
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	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

**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.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FOURTH QUARTER			
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
	FIFTH QUARTER			
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
	SIXTH QUARTER			
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 a foreign language in high school may petition for advanced placement into the second year of the foreign language at the College.

BUSINESS ADMINISTRATION

Degree: Associate in Science

Length: Six-quarter (two-year) program

Purpose: There is a great demand for qualified personnel in business administration to help provide leadership.

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 sciences, 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 page, the student will be awarded the Associate in Science degree with a major in Business Administration.

BUSINESS ADMINISTRATION

Associate in Science Degree Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
ENGL 111	English Composition I	3	0	3
[illegible]	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	—	—	2-4
		—	—	—
	Total	—	—	16-18
	SECOND QUARTER			
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	—	—	2-4
		—	—	—
	Total	—	—	16-18
	THIRD QUARTER			
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	—	—	2-3
		—	—	—
	Total	—	—	16-18
	FOURTH QUARTER			
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	—	—	0-3
		—	—	—
	Total	—	—	16-18
	FIFTH QUARTER			
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
COVT	Government*	3-5	0	3-5
	Elective	—	—	0-3
		—	—	—
	Total	—	—	15-18
	SIXTH QUARTER			
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	—	—	0-4
		—	—	—
	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 and throughout the world. The engineer is a most important member of the technical team, which includes the scientist, 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
Agricultural Engineering
Architectural Engineering
Ceramic Engineering
Chemical Engineering
Civil Engineering
Electrical Engineering
Engineering Mechanics
Industrial Engineering
Mechanical Engineering
Metallurgical Engineering
Mining Engineering
Nuclear 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 on the next page, 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
	FIRST QUARTER			
CHEM 111	General Inorganic Chemistry I	3	3	4
MATH 141	Mathematical 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
	SECOND QUARTER			
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	0	3	1
	Total	15	9	18
	THIRD QUARTER			
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	0	0-3
	Total	15-16	6	17-18

*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.

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credit.
	FOURTH QUARTER			
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	3	0	3
	Total	17	3	18
	FIFTH QUARTER			
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)	0-3	0	0-3
	Total	15-18	3	16-18
	SIXTH QUARTER			
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)	0-3	0	0-3
	Total	14-17	6	16-18
	Total Minimum Credits of Pre-Engineering Major			106

**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

72 **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

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
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	—	—	3
	Total	—	—	17
	SECOND QUARTER			
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	—	—	3
	Total	—	—	17
	THIRD QUARTER			
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	—	—	3
	Total	—	—	17
	FOURTH QUARTER			
ENGL 261	English Literature	3	0	3
PSYC 201	General Psychology	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	—	—	0-3
	Total	—	—	15-18
	FIFTH QUARTER			
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	—	—	0-3
	Total	—	—	14-18
	SIXTH QUARTER			
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	—	—	0-3
	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 or 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 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 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, it 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 on the next page, 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
	FIRST QUARTER			
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	—	—	3-6
		—	—	—
	Total	—	—	15-18
	SECOND QUARTER			
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	—	—	3-4
		—	—	
	Total	—	—	17-18
	THIRD QUARTER			
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	—	—	3-5
		—	—	—
	Total	—	—	16-18
	FOURTH QUARTER			
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	—	—	0-3
		—	—	—
	Total	—	—	14-18
	FIFTH QUARTER			
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	—	—	0-4
		—	—	—
	Total	—	—	14-18
	SIXTH QUARTER			
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	—	—	0-4
		—	—	—
	Total	—	—	14-18
	Total Minimum Credits for a Science 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.

AUTOMOTIVE TECHNOLOGY

76 **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 skill 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 on the next page will be awarded a Diploma in Automotive Technology.

AUTOMOTIVE TECHNOLOGY

Two-Year Diploma Program

Course Number	Course Title	Lecture Hours	Lab Hours	Course Credits
	FIRST QUARTER			
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 I	4	0	4
PHED 101	Health, Phys. Ed., or Recreation	0	3	1
	Total	13	16	18
	SECOND QUARTER			
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	3	3	4
	Total	14	12	18
	THIRD QUARTER			
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	3	3	4
	Total	13	14	18
	FOURTH QUARTER			
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	0	6	2
	Total	10	24	18
	FIFTH QUARTER			
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
	SIXTH QUARTER			
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

78 **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.

Occupational Objectives: 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 him to meet the obligations of society.

Students successfully completing the three-quarter sequence in Mechanical Drafting receive a Certificate of Completion. Job opportunities 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
	FIRST QUARTER			
DRFT 131	Mechanical Drafting	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	2	3	3
GENL 100	Orientation	1	1	1
ECON 160	American Economics	3	0	3
	Total	14	16	18
	SECOND QUARTER			
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	3	0	3
	Total	13	16	17
	THIRD QUARTER			
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	3	3	4
	Total	14	15	18

*Electives must be approved by the Department Chairman

PREPARATORY FOUNDATION 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. 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. Perhaps he has not had an opportunity to complete an appropriate educational course or program, or he has low achievement in his previous education. 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 FOUNDATION 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 011, 012, 013—Basic Physics (12 cr.)

3. 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 associate degree program but may be applicable to a certificate or diploma 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 not 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 credit 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 seminar and discussion hours) and/or the number of laboratory hours in class each week (including 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 student 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, they 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 245, 246, 247
B. Computer Electronics—ELEC 255, 256, 257
C. Industrial Electronics—ELEC 210, 211, 212

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 091 WORKSHOP IN WATERCOLOR (2 cr.)—A special workshop for individual special projects in watercolor. Laboratory 6 hours per week.

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 INTRODUCTION TO THE ARTS I-II (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 principals 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 186 FUNDAMENTALS OF PHOTOGRAPHY (5 cr.)—A study of the fundamental techniques of the camera and its expressive possibilities in relation to the field of design and visual communication. Lectures 3 hours, Laboratory 6 hours, Total 9 hours per week.

ARTS 196 ART WORKSHOP (2 cr.)—A workshop for individual special projects in arts and crafts. Laboratory 6 hours per week.

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 241-242-243 THEORY AND PRACTICE OF SCULPTURE I-II-III (3 cr.) (3 cr.) (3 cr.)—The fundamental processes in the creation of form by work with various materials such as clay, plaster, wood, stone and metal. Lectures 2 hours, Laboratory 3 hours, Total 5 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 approches 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 ARCHITECTURE 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 construcion into graphic presentation. Lecture 1 hours, 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 bearing 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 electical 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 264. 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 cost. The student will study materials take-off, sub-contractors' estimates of cost, 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 adjustment 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 006 BASIC BIOLOGY— (4 cr.)—A foundations course in general biology designed to develop a basic understanding of plant and animal life. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

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 067 APARTMENT HOUSE RESIDENT MANAGERS COURSE (3 cr.)—A course designed to orient a person to the duties and responsibilities of a resident apartment house manager. Lectures 3 hours per week.

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 130 MARKETING PRINCIPLES AND PRACTICES (3 cr.)—A course in the principles, methods, and problems involved in the distribution and marketing of goods and services. It includes a study of the various marketing agents: wholesaler, broker, agent cooperative, and trade association. Discussions of present day problems and policies connected with the distribution and sales of commodities, pricing, advertising and promotion, and buyer motivation. Lectures 3 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 160 SURVEY OF INSURANCE (3 cr.)—A course in insurance principles and practices. Includes an examination of risks and applications in the principal fields of insurance, including life, accident and health, fire, liability, surety, and property. Lectures 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 266 REAL ESTATE (3 cr.)—Practical application of real estate management principles. Includes a study of contracts, deeds, mortgages, bonds, leases, search, real property leasing and appraisal. 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 006 BASIC CHEMISTRY (4 cr.)—A foundations course in general chemistry designed to develop a basic understanding of inorganic and organic chemistry. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

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 111-112-113 GENERAL INORGANIC CHEMISTRY I-II-III (4 cr.) (4 cr.) (5 cr.)—Fundamental principles and laws underlying chemical action with special emphasis on the non-metals and their compounds, and theories and problems concerning them. The laboratory work for the first half of the course deals chiefly with the non-metallic elements and their compounds. The second half deals with the theories of qualitative analysis. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week. (Laboratory for CHEM 113 is 6 hours.)

CHEM 151-152 HEALTH SCIENCE CHEMISTRY I-II (4 cr.) (4 cr.)—This is primarily an introductory course in chemistry for students in the health sciences. It deals with the basic principles of inorganic, organic, and biological chemistry. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

CHEM 221-222-223 QUANTITATIVE ANALYSIS I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite CHEM 103 or CHEM 113 or equivalent—The theory and practice in standard methods of gravimetric, volumetric, colorimetric, and electrometric analysis. Special emphasis is placed on equilibrium in acid-base and oxidation-reduction equations, as well as the stoichiometry of chemical reactions. The third quarter is devoted to instrumental analysis. Lectures 2 hours, Laboratory 6 hours, Total 8 hours per week.

CHEM 241-242-243 ORGANIC CHEMISTRY I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite CHEM 103 or CHEM 113 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.

CHEM 299 SEMINAR AND PROJECT IN CHEMICAL 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 chemical technology.

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) detailing, 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 c.)—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 frost action, stabilization, stress, consolidation, settlement, shearing strength, stability, embankments, dams, retaining walls, piles and underground conduits. The laboratory work covers ASTM AND AASHO 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 quantities. 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, let-

tering, 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 sytems. 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.

DRAMA

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.

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.

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.

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.

EDUCATION

EDUC 206 FOUNDATIONS OF EDUCATION (5 cr.)—The aims, organization, and procedures of public school education with the objective of giving students a common integrating background of information and understanding relative to the total problem of public school education. Lectures 5 hours per week.

ELECTRICAL ENGINEERING TECHNOLOGY

ELEC 011-012-013 BASIC ELECTRICITY (4 cr.) (4 cr.) (4 cr.)—This is a three-quarter course which assumes no background in DC or AC Theory. Principles of electricity are taught covering resistance, current, and voltage in both DC and AC states. An elementary knowledge of algebra is assumed. The course is designed to lead into the Basic Electronics course ELEC 021, 022, 023. Laboratory experiments will be performed to supplement the classroom work. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 021-022-023 BASIC ELECTRONICS (4 cr.) (4 cr.) (4 cr.)—This course builds on the background of the basic electricity course and covers an introduction to vacuum tube and semiconductor principles and circuitry. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 031-032 REVIEW FOR FCC TELEPHONE (3 cr.) (3 cr.)—The first quarter covers the material needed for the third class exam and the second quarter covers the material for the second class exam. Lectures 3 hours per week.

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 and Corequisite MATH 123. 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 111. An integrated course covering the basic concepts of electron and solid-state physics. Consideration is given to the application of vacuum, gas, and semi-conductor 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 ad-

vanced 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 111. 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, synchonous 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 216 CIRCUITS I (5 cr.)—Prerequisite PHYS 223. Fundamentals of circuit theory. Elements of network topology, mesh currents and node voltages. Methods used for solving one-port and two-port networks. Lectures 5 hours per week.

ELEC 241 COMMUNICATIONS I (4 cr.)—Prerequisites ELEC 116 and 126, or their equivalent. An introduction to modulation and power in modulated waves. Topics included are sinusoidal 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 249 PRINCIPLES OF TELEVISION ELECTRONICS (3 cr.)—A lecture-demonstration course dealing with the special devices and techniques associated with monochrome and color, broadcast and industrial television transmission and reception. Specifically included are the standards of American television electronics as set down by the National Association of Broadcasters (NAB). Cameras and television receivers are given special emphasis. Lectures 3 hours per week.

ELEC 250 INTRODUCTION TO COMPUTERS (4 cr.)—Prerequisite ELEC 202. A general introduction to concepts and basic features of electronic computers. Topics include: fundamentals of internal operations, number systems, digital circuits, boolean algebra, basic logical design techniques, analysis of input-output devices, control and arithmetic units, memory units and limited programming. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 251 COMPUTER ELECTRONICS I (4 cr.)—Prerequisite ELEC 111 and corequisite ELEC 201. An introductory computer course covering

number systems, programming fundamentals, and boolean algebra. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 252 COMPUTER ELECTRONICS II (4 cr.)—Prerequisite ELEC 251 and corequisite ELEC 202. A continuation of ELEC 251 covering logic circuits, in addition to the arithmetic and memory sections of the computer. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 253 COMPUTER ELECTRONICS III (4 cr.)—Prerequisite ELEC 252. This course is a continuation of ELEC 252, including computer equipment, computer organization, and advanced computer circuits. Lectures 3 hours, Laboratory 3 hours, Total 6 hours per week.

ELEC 258 ELECTRONIC DATA PROCESSING (3 cr.)—Prerequisite MATH 123. 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 111. 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 of 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 290 ELECTRICAL PROJECTS (1 cr.)—Prerequisite ELEC 290. This course is a project in which the student designs, builds and tests an electronic circuit or system. Any or all parts of the project which is suitable for shop construction shall be fabricated by the student. A formal report shall be required upon completion of the project. Laboratory 3 hours per week.

ELEC 299 SEMINAR AND PROJECT IN ELECTRICAL ENGINEERING 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 electrical and electronics technology.

ENGLISH

ENGL 040 READING IMPROVEMENT (3 cr.)—A course designed with the use of modern techniques, equipment, and materials to increase the student's comprehension, skill, and speed in reading. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

ENGL 041-042 READING IMPROVEMENT I-II (3 cr.) (3 cr.)—Designed to improve speed and comprehensive capacity of the student in reading. Where special reading problems are discovered, an opportunity for special work will be offered. Lectures 2 hours, Laboratory 3 hours, Total 5 hours per week.

ENGL 046 DEVELOPMENTAL READING (5 cr.)—A basic course for the development of good reading habits and skills with emphasis on improved reading comprehension. Lectures 3 hours, Laboratory 4 hours, Total 7 hours per week.

ENGL 086 PARLIAMENTARY LAW (2 cr.)—This course is designed to cover the requirements of the National Association of Parliamentarians. It involves a minimum of sixteen hours of lecture and practice in parliamentary law procedures and understanding. Lectures 2 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 103 COMMUNICATION SKILLS III (3 cr.)—Prerequisite ENGL 102. This course puts into practice the skills learned in ENGL 101-102. The student will do research, outline, and some creative and technical 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 jounalistic 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 136 SPEECH COMMUNICATIONS (3 cr.)—Prerequisite ENGL 102 or equivalent. 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. Includes advanced basic research techniques and technical report writing. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

ENGL 137 PUBLIC SPEAKING (3 cr.)—Development of skill in speechmaking, 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 4 hours, Laboratory 2 hours, Total 5 hours per week.

ENGL 138 PERSUASIVE SPEAKING (3 cr.)—Prerequisite ENGL 137. A continuation of ENGL 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.

ENGL 139 ORAL 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.

ENGL 180 FUNDAMENTALS OF BUSINESS ENGLISH (3 cr.)—Course materials will be selected to develop skill in preparation of business correspondence, memoranda, inter-office correspondence, reports, surveys and similar communications. Emphasis will be placed on correct language, form, content, techniques, and comprehension; exercises will be provided to improve skills. Lectures 3 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 ideals. It requires an adequate amount of parallel reading, especially the novel and drama. Lectures 3 hours per week.

ENGL 251-252-253 AMERICAN LITERATURE I-II-III (3 cr.) (3 cr.) (3 cr.)—Prerequisite ENGL 113 or equivalent. The cultural history of America as revealed through its major literary works and historical events. Emphasis on the ideas, themes and characteristics of an emerging national literature. I. Colonial period to 1860; II. 1860 to 1914; III. 1914 to the present. Lectures 3 hours per week.

ENGL 260 SURVEY OF ENGLISH LITERATURE (3 cr.)—Prerequisite ENGL 113 or equivalent. A course designed first to present a general survey of English literature from Beowulf to the present time and, second, to help the student improve his reading ability and to develop a more intelligent appreciation of literature in general. 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 136 and 180. 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

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, MATH 141. 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 or MATH 112. 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 or MATH 113. A discussion of

strength of material concepts with laboratory demonstrations and experiments.

ENGR 153 MECHANICS III (3 cr.)—Prerequisite ENGR 152 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 (STATICS) (4 cr.)—Prerequisite ENGR 123, MATH 143. Corequisite MATH 241 and PHYS 221. Vector treatment 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 5 hours per week.

ENGR 253 ENGINEERING MECHANICS III (MECHANICS OF SOLIDS) (4 cr.)—Prerequisite ENGR 251. Corequisite MATH 243 and PHYS 223. Introductory mechanic 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 (3 cr.) (3 cr.) (3 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.

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.

GERM 101-102-103 ELEMENTARY GERMAN I-II-III (3 cr.) (3 cr.) (3 cr.)—Introductory training in the speaking, understanding, reading, and writing of German. 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 (22 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. Lectures 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.

HLTH 154 FIRST AID I (2 cr.)—A standard first aid course with the principles and techniques of safety and first aid. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

HLTH 155 FIRST AID II (2 cr.)—Prerequisite HLTH 154. An advanced first aid course on the principles and techniques of safety and

 first aid. Safety projects and problems. Lecture 1 hour, Laboratory 2 hours, Total 3 hours per week.

HLTH 226 ELEMENTS OF NUTRITION (3 cr.)—Elements of nutrition and practice influencing the ability of the individual and the family to secure and maintain good nutritional status. Lectures 3 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 meets the full requirements for elementary mathematics in the machinist, drafting, toolmaking, and auto mechanic trades. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

MATH 016 HEALTH SCIENCE MATHEMATICS (2 cr.)—A review of arithmetic and algebra with special emphasis on calculations involvvolving dosages of drugs and concentration of solutions. Lectures 2 hours per week

MATH 021-022-023 ELEMENTARY TECHNICAL MATHEMATICS I-II-III (4 cr.) (4 cr.) (4 cr.)—A survey of mathematics, including algebra, geometry, and trigonometry, with practical applications in technical problems. Provides a foundations in mathematics for technically-oriented students who need to develop their mathematical competencies before beginning more advanced technical mathematics courses. Lectures 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 will 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 introductory review of 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 037 BASIC PLANE GEOMETRY AND TRIGONOMETRY (5 cr.) —Fundamentals of plane geometry and an introduction to trigonometry for students who need a review or survey of the basic principles in plane geometry and elementary trigonometry. Lectures 5 hours per week.

MATH 038 BASIC TRIGONOMETRY (5 cr.)—Fundamentals of trigonometry for students who want an introductory review of trigonometry. Lectures 5 hours per week.

MATH 039 REVIEW OF ALGEBRA AND TRIGONOMETRY (5 cr.)—Prerequisite MATH 011-012-013 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 038 or equivalent. Algebra, trigonometry, and introduction to calculus. Some emphasis on graphical methods. 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 036 and MATH 038 or equivalent. 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 038 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 or equivalent. 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 221-222 ADVANCED ENGINEERING TECHNICAL MATHEMATICS I-II (4 cr.) (4 cr.)—Prerequisite MATH 123. Differential and integral calculus with some emphasis on applied problems in the appropriate technological fields. Lectures 4 hours per week.

MATH 231 FINITE MATHEMATICS I (3 cr.)—Prerequisite MATH 133 or equivalent. The first quarter of finite mathematics includes further development of some concepts introduced in first year college math, including logic, set theory, permutations and combinations, probability, relations and functions, inequalities, and introduction to linear programming, literary equations and matrices, and determinants. Lectures 3 hours, Total 3 hours per week.

MATH 232 FINITE MATHEMATICS II (3 cr.)—The second quarter includes the study of some non-linear relations, quadratic exponital and logrithmic graphs, sequences, limits, and summation, matrices, lecture spaces, linear dependents, bases, general solutions of linear equations, theory and application of the simplex method of linear programming. Application to business and industry are stressed throughout. Lectures 3 hours, Total 3 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 256-257 NUMERICAL ANALYSIS I-II (3 cr.) (3 cr.)—A special course designed for students enrolled in the Scientific Data Processing Program. Course materials will be designed to meet the occupational goals of students enrolled, and will be adapted for interpretation and use in data processing. Formulae; data treatment; analysis of numbers and formula; adaption of logic and special numerical applications. Lectures 3 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.

MATH 274 ADVANCED DIFFERENTIAL EQUATIONS (4 cr.)—Prerequisite MATH 273 or equivalent. Variables, functions, limits, differentiation, application to curve sketching, differential integration, application of the integral to area and volume solutions, power series, fourier series, ordinary and partial differential equations with applications. Lectures 4 hours, Total 4 hours per week.

MECHANICAL ENGINEERING TECHNOLOGY

MECH 114 MECHANICAL ENGINEERING DRAFTING I (2 cr.)—Prerequisite ENGR 121. A continuation of topics introduced in ENGR 121, plus threads and fasteners, sectioning, conventional representation, working drawings and some specialized drafting areas. Provides additional understanding of drafting problems and skills and techniques that are essential to the work of draftsmen. The student is given work dealing with gears, cams, jigs, and fixtures in preparation for the second year courses. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

MECH 115 MECHANICAL ENGINEERING DRAFTING II (2 cr.)—Prerequisite MECH 114. The student is given more advanced problems (including the principles of descriptive geometry) and is encouraged to analyze the problems, collect data, and make mathematical calculations, complete drawings, and check out work. Lecture 1 hour, Laboratory 3 hours, Total 4 hours per week.

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 267 MECHANICS OF FLUIDS (4 cr.)—Prerequisite ENGR 152. Properties of fluids and fluid flow with application to pumps, fans, and turbines. Laboratory includes application of principles covered in lecture. 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 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 machine and mechanical technology.

MUSIC

MUSIC 121-122-123 INTRODUCTION TO MUSICAL LITERATURE I-II-III (3 r.) (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 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, badminton, bowling, golf, 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 226 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 111-112-113 TECHNICAL PHYSICS I-II-III (4 cr.) (4 cr.) (4 cr.)—Prerequisite one year of algebra. Precision measurement, properties of matter, hydrostatics and hydraulics are studied first. Then force and motion and Newtonian mechanics. Vectors and graphic solutions are followed by a study of statics. Then dynamics, followed by rotary motion. A detailed treatment of heat and thermodynamics, with unusual emphasis being placed on heat engines. There is an elementary treatment of sound and acoustics. Further development of the theory of wave motion leads into the study of light and optics. A rather extensive treatment of magnetism and electricity follows, with emphasis on DC and AC circuits and machines. An introduction to basic electronics follows, and the course closes with a brief treatment of nuclear energy for industrial purposes. 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. Co-requisite 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; policy 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 emloyment 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 areas 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 pro-

duction 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 standard 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 156 PERSONAL DEVELOPMENT (3 cr.)—A course designed to develop the personality, appearance, and values necessary to make a favorable impression on the job. Lectures 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 polices. Textbook instruction is supplemented by actual on-the-job experience in solving practical problems. Lectures 2 hours, Laboratory 2 hours, Total 4 hours per week.

SECR 299 SEMINAR AND PROJECT IN SECRETARIAL SCIENCE (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 business offices. Also includes discussions of professional topics in general and a study of approaches to selection and pursuit of employment and career opportunities in secretarial science.

SECR 266 MACHINE TRANSCRIPTION (3 cr.)—Prerequisite SECR 216. Introduction to machine transcription, incorporating good listening techniques, grammar, punctuation, and correct business English. Emphasis is placed on mailability of copy with good production rates. 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 236 MARRIAGE AND THE FAMILY (3 cr.)—A study of comparative family systems and problems related to marriage and the family. Lectures 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 (3 cr.) (3 cr.) (3 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.)—Prerequisites 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.

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.

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