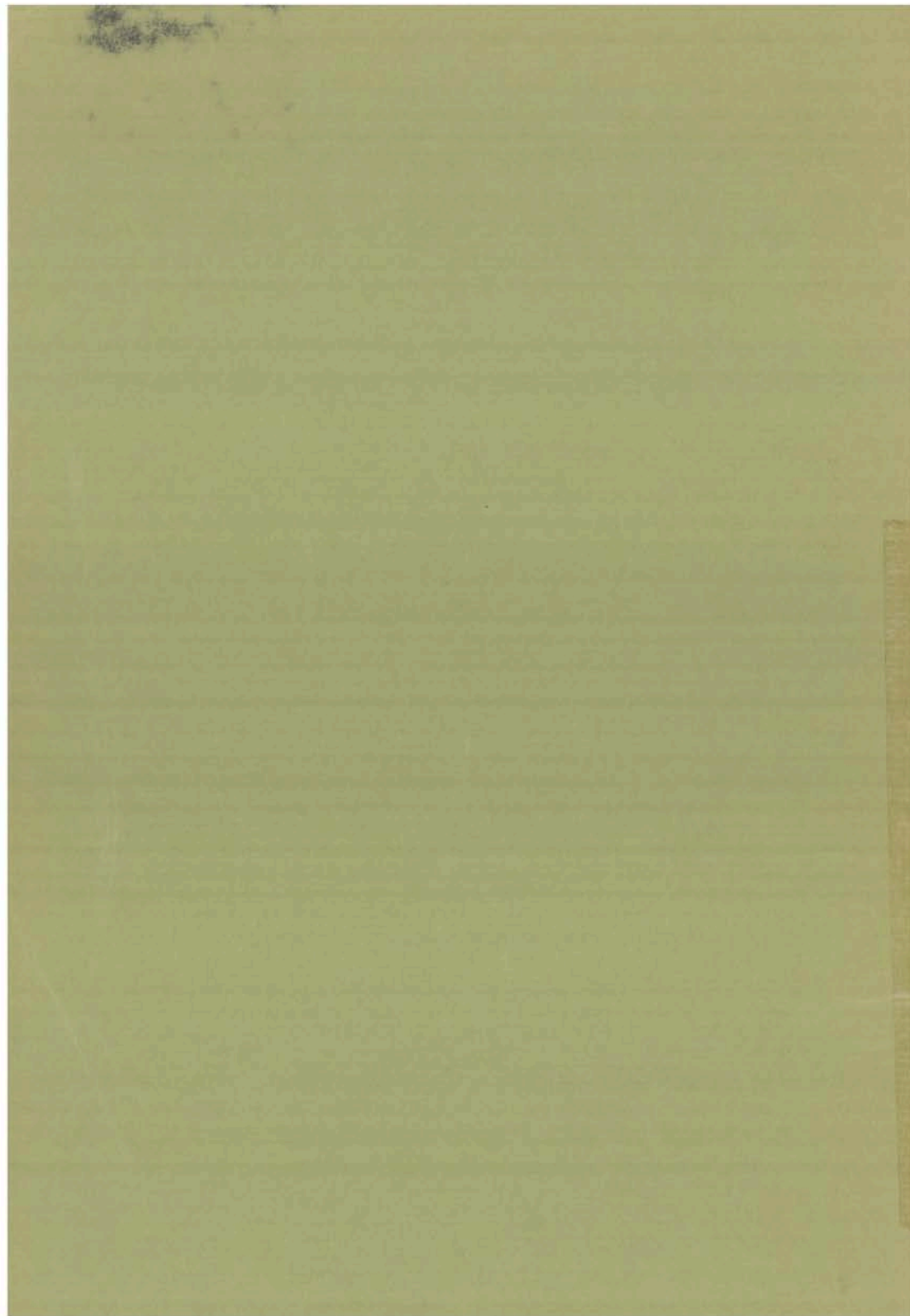


**CATALOG**  
**Northern Virginia**  
**Technical College**  
**1965-1966**

Desk Copy

College Records Cy





**NORTHERN VIRGINIA TECHNICAL COLLEGE**

**A Division of the  
Virginia State Department of Technical Education**

**CATALOG OF COURSES**

**Day and Evening College  
Fall — Winter — Spring — Summer  
1965-66**

**PRELIMINARY CATALOG  
August 1965**

**3443 S. Carlyn Spring Road  
Bailey's Crossroads, Va. 22041  
Tel.: 481-9100**

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# THE COLLEGE CALENDAR

1965 - 1966

## Fall Quarter

Pre-Registration Counseling .....Aug. 1 — Sept. 20  
Registration — Freshman Days .....Sept. 20 - Sept. 24  
Classes Begin .....Sept. 27  
Last day for withdrawal without penalty .....October 22  
Thanksgiving Recess.....November 25 — 26  
Final Exam Days .....December 15-16-17

## Winter Quarter

Registration.....December 1 — 31  
Classes Begin.....January 3  
Last day for withdrawal without penalty.....January 28  
Washington's Birthday (holiday).....February 22  
Final Exam Days.....March 16 — 17 — 18

## Spring Quarter

Registration.....March 1 — 11  
Classes Begin.....March 21  
Easter Recess.....April 8 — 11  
Last day for withdrawal without penalty.....April 15  
Final Exam Days .....June 6 — 7 — 8

## Summer Quarter

### First Session

Registration.....June 1 — 17  
Classes Begin.....June 20  
Holiday.....July 4  
Classes End.....July 22

### Second Session

Classes Begin.....July 25  
Classes End.....August 26

## HISTORICAL BACKGROUND

Pursuant to legislation recommended by the Governor of Virginia and enacted by the General Assembly in the 1964 Session, the State is authorized and directed to establish a number of strategically located two-year Technical Colleges. These Colleges are to be established and governed by the State Board of Technical Education. The instruction offered shall be designed to prepare the students for entry or advancement in employment in industrial, technical, artisan or crafts, and semi-professional occupations. The Colleges are authorized to grant the degree of Associate in Applied Science. They will also provide refresher or up-to-date training for employed persons on a part-time basis. Special, short-term training to meet specifically identified manpower requirements will also be designed and given to meet these needs.

Northern Virginia Technical College was the first to be established under this newly-created State-wide system of two year colleges. The seven political jurisdictions of Northern Virginia: The cities of Alexandria, Fairfax and Falls Church, and the counties of Arlington, Fairfax, Loudoun and Prince William were ready with plans based upon previous studies for this type of educational program. In November 1964 the governing bodies of these jurisdictions implemented this State policy by appointing members to serve on the local Board of Trustees for the College. In May of 1965 the President of the College was appointed. June 1965 was the beginning of the many activities necessary for the September 20, 1965 opening of the College.

## PURPOSE AND OBJECTIVES OF THE COLLEGE

### Purpose

The purpose of the college is to provide occupational education designed to train or retrain people in Northern Virginia for gainful employment in business and industry. The instructional methods used in this job-centered education will simulate and emphasize materials and machines used in the various occupations. In addition to the special occupation courses, the College will offer education courses to provide the student with basic math and scientific principles underlying their occupational objective. It also includes general education subjects to develop leadership and attitudes to aid the individual to be a better informed and more productive participant in our society.

The Northern Virginia Technical College, as envisioned in the Virginia statutes, will fulfill the educational requirements to meet the manpower needs of the community by offering technical and

semi-professional programs at the college level. It will also provide a special educational service to present and future new industries to the Northern Virginia area.

To meet the challenge of an increasing technological society, the college, through the Continuing Education Program, will provide an opportunity to the employed worker and professional to continue development and improvement of his skills and abilities; or to retrain to meet his individual changing needs or those of the community.

### Objectives

To provide for the Northern Virginia area, and more generally, for the State of Virginia, a pool of trained manpower to help meet its need for technically trained employees for growing and new business, industry and government;

To supply for existing business, industry and government a facility for training, improving and up-dating the skills and abilities of its present personnel resources;

To provide opportunities for young people to enter technical and business training beyond the high school level while living at home; to offer new opportunities to high school graduates and those who have interests and capabilities in technical and occupational pursuits even though they have left school before being graduated;

To offer facilities to persons currently employed and experienced in work for the purpose of gaining new skills and know-how; to keep abreast of new developments in their fields of employment; to provide re-training and refresher education to those wishing to re-enter the employment field or to gain new knowledge or insight in the field of general education;

To improve the posture of Northern Virginia and, to a degree the state as a source of manpower trained in the technical and business fields.

It is the policy of the faculty of the College that every subject in the curriculum can and should contribute to the understanding of the complex civilization in which we live. Recognition of individual student differences, personal contacts, smaller classes and frequent informal conferences should enable a student to make a wise decision concerning his educational program.

Regardless of his choice of occupation, the student will find that adequate skill and knowledge and pride in workmanship and accomplishment, obtained under the guidance of a sympathetic advisory sys-



tem and friendly instructor-student relationships, will aid him in assuming the duties, obligations and privileges of a competent citizen in a working democracy.

## **CAMPUS**

The Northern Virginia Technical College serves the area which consists of the counties of Arlington, Fairfax, Loudoun, Prince William and the cities of Alexandria, Fairfax and Falls Church. These communities have a total population of approximately 700,000, with a projected growth to 2,500,000 in the next 25 years. The Northern Virginia area is considered to be a part of the Metropolitan Washington, D. C. region.

The first "campus" is temporarily located at 3443 S. Carlyn Spring Road, Bailey's Crossroads, Virginia. The location is near the junction of Fairfax County, Arlington County and the City of Alexandria. Situated in a densely populated area, the College is accessible from the major traffic arteries of Virginia State Route 7 and Columbia Pike. Adequate parking for commuting students is provided at the building.

Studies are now being made and preliminary plans developed to determine the capacity, most appropriate location and characteristics of the permanent campuses and buildings for the College. Two generalizations concerning the probabilities are that the central permanent campus should be near the center of population of the Northern Virginia area and that it should be located near major highways. Other campuses will be established at a later date to meet the growing needs of the communities. They will be located so that no student residing in the area should be more than 20 to 30 minutes drive from the nearest campus.

## **EQUIPMENT**

The laboratories of the College are being equipped with the most modern apparatus, suitable to technical education. The electronic data processing machines and equipment are of the latest available design. The occupational training shops are equipped with the most up-to-date machinery and equipment. This equipment is of the same quality as used by leading industries in this area. The business machines in the Secretarial Science program are housed in model office situations. The classroom furniture is functionally modern, contributing to the environment for effective learning.

The library, which is the heart of a technical institution, consists of carefully selected books, most of which were chosen from a booklist prepared under the guidance of the United States Office of Education

and with the recommendation of major publishers of technical works. In addition to the collection of books in the technologies and business science, the library has a large collection of essential periodicals, reports, and technical aids. When completed, the library collection is expected to be one of the outstanding sources of technical information in the region.

## **STUDENT INFORMATION**

### **ADMISSION REQUIREMENTS**

#### **General Requirements**

All candidates for the Associate in Applied Science degree must have a high school diploma or its equivalent. Placement examinations will be required to determine their beginning level. To assure an opportunity for reasonable success, counseling will be provided to determine individual programs.

A pre-technical program is available for those students who lack essential preparation or who desire an extensive review to become adequately prepared to enter one of the regular technical programs leading to the Associate in Applied Science degree.

Any person who can profit from the instruction, is 18 years of age or a high school graduate, may enroll in a course.

#### **Admission Procedure**

An applicant meeting the above general requirements should first obtain application forms from the Admissions Office and request his secondary school to forward a transcript of his high school record to the College. Application forms will be mailed upon request.

While application for enrollment may be made at any time preceding the anticipated date of entry, it is strongly recommended that this be done at least 30 days prior to such date. Applicants will be accepted on a first-come, first-served basis. No application will be processed until initial payment of \$5.00 has been made. Entrance requirements may be modified or changed from time to time to meet the demands of the community.

#### **Admission with Advanced Standing**

The Northern Virginia Technical College will accept work and give credit for work completed in other technical institutions and colleges. Appropriate work experience subjects will be evaluated for possible recognition on an individual basis. Applicants for admission with advanced standing should complete the regular application form and submit it together with a transcript of work from prior schools. Acceptance of such credit will be at the discretion of the Admissions Office.

### **Counseling and Testing**

There is a full-time occupational advisory program available to all students. Applicants for admission may be given appropriate tests prior to acceptance and registration. The counselor will schedule interviews with applicants concerning interpretation of their test scores and will advise them concerning course selections. Applicants are not encouraged to enroll unless it is believed they have made a sound choice and will profit from their study.

Counseling services will be available at any time to prospective students as well as those enrolled.

### **EXPENSES**

#### **Fees:**

A \$5.00 application fee must accompany prospective student's application. This fee is not applicable to tuition and not refundable unless requested program is not offered.

#### **Tuition:**

Northern Virginia Technical College has been planned as a low tuition, commuter college in order to increase opportunities for many students. Tuition fees are established by the State Board of Technical Education.

Full Time:	Northern Virginia Resident .....	\$ 15.00 per month
		45.00 per quarter
	Other Virginia Resident .....	25.00 per month
		75.00 per quarter
	Out of State Resident .....	50.00 per month
		150.00 per quarter
Part Time:	Northern Virginia Resident .....	\$ 3.00 per credit hr.
	Other Virginia Resident .....	5.00 per credit hr.
	Out of State .....	10.00 per credit hr.

**Books and Materials** — Approximately \$150.00 per year.

#### **Refunds:**

Refunds for students will be based on a pro-rata basis of a 90 day quarter from date of official resignation. No refunds will be made after 14 calendar days of quarter for course changes; or for resignation from college after 60 calendar days of quarter.

### **Text Books**

Textbooks, to be purchased by the student in advance of class admission, vary in cost. As a service to students, Northern Virginia Technical College maintains a bookstore at which the student may purchase texts at a cost-plus-shipping charge. Used books may be purchased by the bookstore if the text is to be used for future courses in the College.

### **Financial Aid**

Northern Virginia Technical College is interested in helping the student obtain his educational goals and has developed a program of scholarships, student loans and work-study programs or part-time employment. Some of the student aid is sponsored by the donating organizations. These are administered cooperatively between the school administration and the sponsoring group. Information may be obtained by contacting the Admissions Office. Awarding of the scholarships and loans will be done following review of the Scholarship Committee and the approval of the organization or person providing the scholarship.

## **SCHOLASTIC REGULATIONS**

### **Student Program**

Students whose grade point average is less than 3.00 for the preceding quarter are not permitted to carry more than 16 hours without special permission.

### **Attendance**

Registration and enrollment in the different classes of Northern Virginia Technical College presupposes that recitations, lectures, and laboratory sessions will be attended regularly. Absence from class naturally detracts from accomplishment and interest. It also leads to habits that are not tolerated by employers. Students who miss class excessively will be dropped from the class involved and given an E grade in the subject.

The student is responsible for making up all work missed during an absence. The student should inform each of his instructors either before the absence or on the date of returning in reference to making up the work which has been missed.

### **Change of Registration**

After completing registration, and within the first week of a quarter, a student may make changes in his program by filling out the proper

blanks, to be secured from the office, obtaining the consent of the instructors concerned and the approval of his advisor. After the first week, no new course may be added to a student's program without official approval.

### **Withdrawal**

During the first four weeks of a quarter, a student may withdraw and receive a grade of W with approval of the Admissions Office. After the close of the fourth week, withdrawals may be granted to a student doing satisfactory work in a course only upon recommendation of the instructor of the course and his advisor. Students intending to withdraw should avail themselves of the opportunity for "exit" counseling. At that time their records can be processed and the courses officially dropped without incurring the penalty of an E mark in all courses for leaving unofficially.

### **Record of Incomplete Courses**

A course record of "Incomplete" is permissible only when the student has been absent for illness or is delinquent for other thoroughly justifiable causes, and in such instances only when a grade of passing work prior to the absence is revealed by the class record. The giving of an Incomplete mark is further contingent upon the student having made known the cause of absence to the instructor, prior to the issuance of grades. It is further provided that any "Incomplete" given under such ruling shall appear finally on the records as an E unless made up during the first succeeding quarter in which the student is enrolled after receiving the mark.

### **Academic Probation**

Any student failing to make a grade point average of 1.5 will be placed on probation until such time as his average is 1.5 or better.

### **Work Program**

A student who is employed by the College or elsewhere should so inform his counselor in order that a satisfactory in-school and out-of-school work program may be effected. A well-planned and well-balanced program of work and of studies is most important and desirable, but care must be exercised in planning a work-study program.

### **Student Conduct**

Students in Northern Virginia Technical College are expected to adopt and observe appropriate standards of conduct, both in and out of college, which will reflect credit upon themselves and the institution.

A student enters college through choice rather than by requirement of law. He is arriving at the age of maturity where good judgment and ability to make wise choices are most desirable. For these reasons he is given considerably more freedom than he has had in the past; and, consequently, he must exercise that freedom with propriety.

Students who fail to meet the social standards of conduct of the College may be placed on probation. A probationary period, unless otherwise specified, is for the duration of one quarter.

## **GRADUATION REQUIREMENTS**

### **Associate Degree Requirements**

To be eligible for graduation from Northern Virginia Technical College with an Associate Degree in Applied Science a student must satisfy the following requirements:

1. Earn a minimum of 90 credit hours, with a grade point average of 2.00 or better.
2. Meet the following specific requirements:

Communication Skills and Speech	6 credit hours.
Social Science and Humanities	9 credit hours.
Mathematics and/or Science	12 credit hours.

Completion of all requirements as prescribed by the College for the particular field in which the student has specialized.

### **Certificate of Course Completion**

Students who pursue a terminal program of instruction which does not lead to an Associate Degree and successfully complete it, will be granted a Certificate of Completion.

Students who pursue a degree program but fail to meet the degree requirements may be issued a Certificate in that occupational specialty in which they are considered proficient.

### **Honorable Dismissal**

To receive an honorable dismissal and be entitled to a transcript of credits, a student must have no outstanding obligations and must have accounted for all college property issued to him.

## GRADING SYSTEM

### Grades and Grade Points

Grades are announced at the middle and end of each quarter of the school year. Mid-quarter grades are informational in nature only and are not recorded permanently. To determine relative standing of student and quality of work, grades are evaluated as follows:

A—Exceptional.....	4 grade points per credit hour
B—Superior.....	3 grade points per credit hour
C—Average.....	2 grade points per credit hour
D—Poor.....	1 grade point per credit hour
E—Failure.....	0 grade point per credit hour
S—Satisfactory (without grade)	
W—Withdrawal	
I—Incomplete	



**Programs  
of  
Study**

**TECHNICAL PROGRAMS**

**Data Processing Curriculum**

**Engineering Design Curriculum**

**Electronics Curriculum**

## DATA PROCESSING TECHNOLOGY

The Data Processing program is designed to provide the student three options — Key punch, requiring one quarter of study; Unit Record Operation, requiring one year of study; and Computer Programming, requiring two years of study. Those students who satisfactorily complete the Key Punch and Unit Record Operation programs will be granted Certificates of Completion. Those who satisfactorily complete the two year Computer Programming program will be awarded an Associate in Applied Science degree.

The Data Processing Technology program is designed to provide the kind of education and training that both computer manufacturers and their customers alike proclaim is needed. Students will be both educated and trained — educated so they will know what needs to be done without being told, and trained so that they will always maintain proper standards of performance. Their education will not be limited to the computer, but will include instruction that will give them an understanding of the environment in which they and the computer will work.

Data processing classes will include practical, "hands-on" experience with the modern equipment found in industry and government installations today. In addition to the laboratory classes scheduled in conjunction with each lecture course, ample laboratory time will be provided on an informal, "homework" basis.

Students pursuing the Unit Record Operation option will follow the same course of study as first year Computer Programming students.

Those students who desire to become proficient only in Key Punch operation will pursue course D. P. 110 described in the section of Course Descriptions.

FIRST YEAR			SECOND YEAR		
No.	Course	Credit Hours	No.	Course	Credit Hours
<b>First Quarter</b>			<b>First Quarter</b>		
DP 101	Intro. to Data Proc. Principles .....	3	DP 113	Computer Programming III .....	3
DP 102	Unit Record Processing Equipment I .....	3	DP 122	Data Processing Applications II .....	3
Eng 101	Communications Skills I .....	3	Bus Sci 201	Introduction to Statistics .....	3
Math 101	Technical Mathematics I .....	3	DP 221	Systems Development & Design I .....	3
Bus Sci 105	Principles of Accounting I .....	3	Sci 105	Survey of Science .....	3
Soc Sci 100	Orientation .....	1			15
		16			
<b>Second Quarter</b>			<b>Second Quarter</b>		
DP 111	Computer Programming I .....	3	DP 114	Computer Programming IV .....	3
DP 103	Unit Record Processing Equipment II .....	2	DP 222	Systems Development & Design II .....	3
Math 110	Data Processing Mathematics I .....	3	Bus Sci 215	Statistics II .....	3
Eng 102	Communications Skills II .....	3	Psych 203	Supervisory Training .....	3
Bus Sci 106	Principles of Accounting II .....	3	Bus Sci 102	Business Organization & Management .....	3
Bus Sci 101	Introduction to Business .....	3			15
		17			
<b>Third Quarter</b>			<b>Third Quarter</b>		
DP 112	Computer Programming II .....	3	DP 115	Computer Programming V .....	3
DP 121	Data Processing Applications I .....	3	DP 223	Systems Development & Design III .....	3
DP 123	Data Processing Accounting .....	3	DP 234	Introduction to Eng Applications .....	3
Eng 103	Speech Communication .....	3	DP 299	Data Processing Field Problem .....	3
Math 120	Data Processing Math II .....	3	Econ 206	Industrial Economics .....	3
		15			15

## ENGINEERING DESIGN

This two year engineering technology program provides engineering technician preparation to qualify the graduate for positions in Civil Engineering Departments, Architectural offices or Engineering Departments of manufacturing plants.

All students take the same program for the first year. They then have the option of pursuing a major in Mechanical Engineering, Civil Technology, or Architectural Drafting and Design.

This two year program leads to an Associate in Applied Science Degree.

FIRST YEAR			SECOND YEAR		
No.	Course	Credit Hours	No.	Course	Credit Hours
<b>First Quarter</b>			<b>First Quarter</b>		
Engr Dsn 101	Mechanical Drafting I.....	3		*Selected Technology.....	8
Engr Dsn 106	Materials of Industry.....	3	Sci 201	Chemistry I.....	2
Math 101	Technical Mathematics I.....	3	Bus Sci 216	Office Machines.....	2
Engr Dsn 107	Strength of Materials.....	2	Govt 204	American Government IA.....	3
Soc Sci 100	Orientation.....	1			15
Eng 101	Communication Skills I.....	3			
		15			
<b>Second Quarter</b>			<b>Second Quarter</b>		
Engr Dsn 102	Mechanical Drafting II.....	3		*Selected Technology.....	8
Engr Dsn 104	Methods of Manufacturing I.....	3	Econ 106	Economics I.....	3
Math 102	Technical Mathematics II.....	3	Psych 202	Applied Psychology IA.....	3
Sci 102	Physics I.....	3		Elective.....	2
Eng 102	Communication Skills II.....	3			16
		15			
<b>Third Quarter</b>			<b>Third Quarter</b>		
Engr Dsn 103	Mechanical Drafting III.....	3		*Selected Technology.....	8
Engr Dsn 105	Methods of Manufacturing II.....	3	Engr Dsn 210	Metallurgy.....	2
Math 103	Technical Mathematics III.....	3	Engr Dsn 299	Field Project.....	2
Sci 103	Physics II.....	2		Elective.....	3
Eng 103	Speech Communication.....	3			15
Health Sci 103	Industrial Safety.....	2			
		16			

NOTE: \*Selected Technology will be in the program option selected by the Student. Options are:

1. Mechanical Engineering (machines, etc.)
2. Civil Technology (highways & buildings)
3. Architectural Design

Specific subject matter will be published after review by Advisory Committee.

## ELECTRONICS CURRICULUM

The Electronics curriculums are two years in length and lead to an Associate in Applied Science Degree or a Certificate of Completion and prepare the student for entry into the electronics field as a technician.

Before entering the first semester of the second year, students will select a major — Basic Electronics, Communication Electronics, Instrumentation, Micro-Miniaturization, Computer Maintenance or Guidance Systems.

Set forth below is the general curriculum for all electronics students for the first year, and the second year of the Basic Electronics option. The detail curriculums for the second year in the other five options will be published at a later date after review by the local Electronics Advisory Committee.

BASIC ELECTRONICS					
FIRST YEAR			SECOND YEAR		
No.	Course	Credit Hours	No.	Course	Credit Hours
<b>First Quarter</b>			<b>First Quarter</b>		
Elec 101	Electronic Devices .....	4	Elec 201	Instruments & Measurements I .....	3
Elec 102	Fundamentals of Electricity .....	3	Elec 203	Communication Circuits I .....	2
Math 101	Technical Mathematics I .....	3	Elec 206	Industrial Control .....	4
Elec 103	Introduction to Circuit Analysis .....	2	Econ 106	Economics I .....	3
Eng 101	Communication Skills I .....	3	Draft 201	Drafting (Electronic) .....	2
Soc Sci 100	Orientation .....	1	Sci 201	Chemistry I .....	2
		16			16
<b>Second Quarter</b>			<b>Second Quarter</b>		
Elec 105	Fundamentals of Electronics .....	3	Elec 202	Instruments & Measurements II .....	2
Elec 104	Circuit Analysis .....	3	Elec 204	Communication Circuits II .....	3
Math 102	Technical Mathematics II .....	3	Elec 208	Introduction to Computers .....	5
Sci 102	Physics I .....	3	Govt 104	American Government I .....	5
Eng 102	Communication Skills II .....	3			15
		15			
<b>Third Quarter</b>			<b>Third Quarter</b>		
Elec 106	Electronic Amplifiers .....	5	Elec 207	Control Circuits & Systems .....	4
Math 103	Technical Mathematics III .....	3	Elec 209	Electronic Design & Fabrication .....	2
Psych 202	Applied Psychology 1A .....	3	Elec 205	Communication Systems .....	4
Sci 103	Physics II .....	2	Elec 210	Introduction to New Electronic Devices .....	2
Eng 103	Speech Communication .....	3		Elective .....	3
		16			15

## OCCUPATIONAL PROGRAM Drafting Curriculum

### DRAFTING

The curriculum in Drafting is intended to train students for employment after graduation as draftsman with engineers, private industry or civil service agencies. Students who complete the suggested program are capable of skilled, neat, rapid lettering and line work, as well as detailing and layout that a junior draftsman is expected to do.

This is a one year non-degree program. Those students who satisfactorily meet the established required standards of proficiency are issued a Certificate of Completion.

No.	Course	Credit Hours
<b>First Quarter</b>		
Draft 101	Drafting I.....	.8
Engr Dsn 106	Materials of Industry.....	.3
Math 21	Geometry.....	.3
Soc Sci 100	Orientation.....	.1
		15
<b>Second Quarter</b>		
Draft 102	Drafting II.....	.8
Math 23	Algebra.....	.3
Psych 105	Human Relations.....	.3
	Elective.....	.2
		16
<b>Third Quarter</b>		
Draft 103	Drafting III.....	.8
Math 25	Elementary Trigonometry.....	.3
Draft 199	Field Project.....	.2
Engr Dsn 104	Methods of Manufacturing.....	.3
		16

## **SEMI-PROFESSIONAL PROGRAMS**

**Business Science and Procedures Curriculum**  
**Police Science and Procedures Curriculum**  
**Secretarial Science and Procedures Curriculum**  
**Nursing**  
**Health Sciences, Work Study Curriculum**

### **BUSINESS SCIENCE AND PROCEDURES**

The Business Science and Procedures program is designed as a two-year program leading to an Associate in Applied Science Degree. Students may elect to continue in the Business Administration course in the second year or a terminal program in Accounting or Applied Business Management. The Business Administration course is designed for those students who may wish to continue their education in Business Administration after completion of the two year program.



**FIRST YEAR**

No.	Course	Credit Hours	No.	Course	Credit Hours	No.	Course	Credit Hours
<b>First Quarter</b>			<b>Second Quarter</b>			<b>Third Quarter</b>		
Bus Sci 101	Introduction to Business	3	Bus Sci 102	Business Organization & Management	3	Bus Sci 106	Principles of Accounting II	3
Math 104	Business Mathematics I	3	Bus Sci 105	Principles of Accounting I	3	Econ 107	Economics II	3
Bus Sci 103	Office Procedures	2	Psych 102	Applied Psychology I	5	Bus Sci 104	Business Law I	3
Econ 106	Economics I	3	Sec Sci 101	Typing I*	1	Govt 204	American Govt IA	3
Eng 101	Communication Skills I	3	Eng 102	Communication Skills II	3	Eng 103	Speech Communication	3
Soc Sci 100	Orientation	1			15			15
		15						

\*Typing appropriate to individual student needs.

**SECOND YEAR**

<b>BUSINESS ADMINISTRATION</b>			<b>ACCOUNTING</b>			<b>APPLIED BUSINESS MANAGEMENT</b>		
<b>First Quarter</b>			<b>First Quarter</b>			<b>First Quarter</b>		
Bus Sci 205	Intermediate Accounting I	3	Bus Sci 205	Intermediate Accounting I	3	Bus Sci 205	Intermediate Accounting I	3
Bus Sci 204	Business Law II	3	Math 204	Business Math II	3	Bus Sci 203	Personnel Management	2
DP 101	Introduction to Data Processing	3	DP 101	Introduction to Data Processing	3	Bus Sci 212	Office Management	3
Math 202	College Algebra	5	Bus Sci 204	Business Law II	3	DP 101	Introduction to Data Processing	3
	Elective	2		Elective	3	Bus Sci 213	Public Relations	2
		16			15	Bus Sci 218	Principles of Supervision	3
								16
<b>Second Quarter</b>			<b>Second Quarter</b>			<b>Second Quarter</b>		
Bus Sci 206	Intermediate Accounting II	3	Bus Sci 206	Intermediate Accounting II	3	Bus Sci 202	Business Finance	3
Bus Sci 203	Personnel Management	2	Bus Sci 207	Money & Banking	3	Bus Sci 207	Money & Banking	3
Bus Sci 201	Introduction to Statistics	3	Bus Sci 216	Office Machines	2	Bus Sci 208	Merchandising (Marketing)	3
Psych 105	Human Relations	3	Bus Sci 202	Business Finance	3	Bus Sci 206	Intermediate Accounting II	3
	Soc Sci Elective	3	Bus Sci 201	Introduction to Statistics	3	Bus Sci 216	Office Machines	2
	Elective	2		Elective	2		Elective	2
		16			16			16
<b>Third Quarter</b>			<b>Third Quarter</b>			<b>Third Quarter</b>		
Bus Sci 202	Business Finance	3	Bus Sci 209	Cost & Tax Accounting	3	Bus Sci 211	Business Taxes	3
Bus Sci 211	Business Taxes	3	Bus Sci 210	Auditing	3	Bus Sci 210	Auditing	3
Bus Sci 216	Office Machines	2	DP 102	Unit Record Processing Equipment I	3	Bus Sci 217	Real Estate & Plant Management	3
	Soc Sci Elective	3	Bus Sci 299	Seminar*	2-4	Bus Sci 299	Seminar*	2-4
	Elective	3		Elective	3		Elective	3
		14			15			15

\*Seminar involves selection of student project dealing with academic objective.

## POLICE SCIENCE AND PROCEDURES

The curriculum in Police Science and Procedures has been developed in cooperation with the Northern Virginia police officials. It is a basic program designed primarily to provide occupational competency and to meet all requirements for the Associate in Applied Science Degree.

The curriculum is not designed to train for any specialty, but rather to provide a broad foundation which will enable the student to enter any of the several fields of law enforcement.

Students who wish to enroll in the Police Science and Procedures program with the objective of obtaining employment with law enforcement agencies in Northern Virginia should meet the following requirements:

1. Excellent physical condition, free from any physical or mental condition which might adversely affect acceptance or performance as a law enforcement officer.
2. 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.
3. Weight should be in proportion to height. Very few law enforcement agencies will accept applicants who are less than 5'9" in height.
4. 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.
5. Before entering practical work program each student will be required to obtain verification of good moral character and absence of a criminal or juvenile record from the Chief of Police or Sheriff of the jurisdiction in which he resides before being accepted into the program. The necessary forms will be provided at the appropriate time.

FIRST YEAR			SECOND YEAR		
No.	Course	Credit Hours	No.	Course	Credit Hours
<b>First Quarter</b>			<b>First Quarter</b>		
Pol Sci 101	Introduction to Law Enforcement	3	Pol Sci 201	Criminal Evidence	3
Pol Sci 103	Fundamentals of Investigative Techniques	3	Pol Sci 204	Firearms II (Marksmanship) <sup>5</sup>	3
Soc Sci 100	Orientation	1	Health Sci 101	First Aid and Safety	1
Sec Sci 101	Typing I <sup>1</sup>	1	Psych 105	Human Relations	3
Psych 102	Applied Psychology	5	Eng 103	Speech Communication	3
Eng 101	Communication Skills I	3	Pol Sci 210	Appl. of D.P. to Pol Sci	3
		16			16
<b>Second Quarter</b>			<b>Second Quarter</b>		
Pol Sci 104	Firearms I <sup>2</sup>	3	Pol Sci 202	Criminal Investigation	3
Pol Sci 106	Duties & Procedures of an Officer	3	Pol Sci 205	Defense and Subdual II	2
Pol Sci 105	Defense and Subdual I <sup>3</sup>	2	Pol Sci 203	Criminal Code	3
Pol Sci 102	Criminal Law	3	Govt 104	American Government I	5
Eng 102	Communication Skills II	3	Health Sci 102	Health Education	2
	Elective	2			15
		16			
<b>Third Quarter</b>			<b>Third Quarter</b>		
Pol Sci 107	Traffic Flow and Control	3	Pol Sci 208	Juvenile Procedures	2
Pol Sci 108	Elementary Photography <sup>4</sup>	2	Pol Sci 207	Order & Control of Crowds	2
Pol Sci 109	Administration of Justice	3	Pol Sci 206	Handling of Difficult Persons	2
Hist 103	Hist. Dev. of U.S. and Va.	5	Pol Sci 209	Police Communication Systems	2
	Elective	3	Pol Sci 299	Practical Experience <sup>6</sup>	4
		16		Elective	3
					15

<sup>1</sup>As appropriate for the individual.

<sup>2</sup>Three 2 hour labs per week.

<sup>3</sup>Two 2 hour labs per week.

<sup>4</sup>Two 2 hour labs per week.

<sup>5</sup>One 4 hour lab per week - includes Laboratory & Ballistics.

<sup>6</sup>Two 4 hour labs per week.



## SECRETARIAL SCIENCE AND PROCEDURES CURRICULUM

There are six basic plans available, each with a specific goal to be attained.

- Plan I Personal Improvement (One or Two Quarters)
- Plan II General Clerical (One-Year Program)
- Plan III Stenographer (One- or Two-Year Program)
- Plan IV Secretarial Science (Two-Year Program)
- Plan V Executive Secretary (Two-Year Program)
- Plan VI Secretarial Specialist (Two-Year Program)

Space does not permit the detailing of each Plan.

### Plan I — Personal Improvement (One or Two Quarters)

This course is designed for either beginning or advanced students who have special interest in a particular subject or subjects, wanting depth instruction, such as speed typing or refresher experience. Students who elect this plan will not receive a Certificate of Completion but will work at their own rate of progress on subjects of their choice. This plan is flexible and particularly meets the needs of students who have had secretarial training and wish to do refresher work in certain skills. The student may leave whenever he has accomplished his purpose.

**Plan II — General Clerical (One-Year Program).** Requirements for a General Clerical Certificate of Completion may be completed in one year. This course is planned for students who wish to acquire a variety of office skills rather than specialize in any particular field.

This course is designed for students who have had little or no training in business subjects. It is a planned program of learning which provides an opportunity to gain a general knowledge of business machines without particular emphasis on any one and practical business subjects, excluding shorthand.

PLAN II		GENERAL CLERICAL	
No.	Course		Credit Hours
<b>First Quarter</b>			
Sec Sci 101	Typing I.....		2
Sec Sci 107	Filing and Records Management.....		2
Sec Sci 111	Personal Analysis I.....		1
Bus Sci 214	Small Business Records.....		3
Eng 101	Communication Skills I.....		3
Math 104	Business Mathematics I.....		3
Soc Sci 100	Orientation.....		1
			15
<b>Second Quarter</b>			
Sec Sci 102	Typing II.....		2
Sec Sci 108	Office Machines I.....		2
Sec Sci 112	Personal Analysis II.....		1
Eng 102	Communication Skills II.....		3
Math 204	Business Mathematics II.....		3
Psych 105	Human Relations.....		3
	Elective.....		2
			16
<b>Third Quarter</b>			
Sec Sci 103	Typing III.....		2
Sec Sci 109	Office Machines II.....		2
Sec Sci 113	Personal Analysis III.....		1
Sec Sci 206	Machine Transcription.....		3
Sec Sci 221	Model Office I.....		2
Eng 103	Speech Communication.....		3
	Elective.....		2
			15

**Plan III — Stenographer (One- or Two-Year Program)**

This course is designed for those students who want to use the stenographic skills as stepping-stones toward a secretarial career. The full stenographic course leading toward a Certificate of Completion in Stenography may be completed in one year with previous experience or in two years for the beginner. Shorthand and typing classes are taken according to previous training or business skills. Students must complete Advanced Shorthand, Machine Transcription, Advanced Typing, and Speech Communication.

**Plan IV — Secretarial Science (Two-Year Program)**

This course is designed for beginning students with little or no secretarial training. Students with previous training will enter the course with advanced standing, and they will complete the course in less than two years.

The complete secretarial science program leading toward the Associate in Applied Science Degree is composed of a balanced schedule of courses consisting of general office typing and advanced techniques, with accent on accurate speed typing and shorthand and general education.

PLAN IV			SECRETARIAL SCIENCE		
FIRST YEAR			SECOND YEAR		
No.	Course	Credit Hours	No.	Course	Credit Hours
<b>First Quarter</b>			<b>First Quarter</b>		
Sec Sci 101	Typing I	2	Sec Sci 201	Typing IV	2
Sec Sci 104	Shorthand I	4	Sec Sci 204	Shorthand IV	4
Sec Sci 107	Filing & Records Management	2	Sec Sci 209	Secretarial Procedures I	2
Sec Sci 111	Personal Analysis I	1	Bus Sci 214	Small Business Records	3
Eng 101	Communication Skills I	3	D.P. 101	Introduction to Data Processing	3
Math 104	Business Mathematics I	3		Elective	3
Soc Sci 100	Orientation	1			
		16			17
<b>Second Quarter</b>			<b>Second Quarter</b>		
Sec Sci 102	Typing II	2	Sec Sci 202	Typing V	2
Sec Sci 105	Shorthand II	4	Sec Sci 205	Shorthand V	4
Sec Sci 108	Office Machines I	2	Sec Sci 206	Machine Transcription	3
Sec Sci 112	Personal Analysis II	1	Sec Sci 210	Secretarial Procedures II	2
Eng 102	Communication Skills II	3	Sec Sci 221	Model Office I	2
Math 204	Business Mathematics II	3	Psych 105	Human Relations	3
		15			16
<b>Third Quarter</b>			<b>Third Quarter</b>		
Sec Sci 103	Typing III	2	Sec Sci 203	Typing VI, Advanced Techniques	2
Sec Sci 106	Shorthand III	4	Sec Sci 211	Secretarial Procedures III	2
Sec Sci 109	Office Machines II	2	Sec Sci 222	Model Office II (Salary, no credit)	0
Sec Sci 113	Personal Analysis III	1	Bus Sci 104	Business Law I	3
Eng 103	Speech Communication	3	Govt 104	American Government I	5
Health Sci 102	Health Education	2		Elective	3
Psych 202	Applied Psychology 1A	3			
		17			15

**Plan V — Executive Secretary (Two-Year Program)**

This course is designed for a student who, because of considerable prior business training, is placed in advanced standing and wants to make a career in the professional secretarial field. Certain tests have to be passed before the student qualifies for this objective, but the salary and personal rewards make this objective worth striving for.

When a student completes the requirements for the Associate in Applied Science Degree, he may apply for admittance into the Executive Secretary objective. The basic program of instruction is similar, with special emphasis on courses in office administration, supervisory training, data processing, etc.

**Plan VI — Secretary Specialist (Two-Year Program)\***

The technical secretarial program prepares the individual to qualify for various intermediate secretarial positions in technical fields. Technical terms and procedures in the areas of engineering and electronics are emphasized. The objective of this plan is to prepare the student for employment as a technical secretary, or "tec-sec."

\*Future expansion of the Secretary Specialist curriculum will permit similar specialized training in both the legal and health sciences fields.

PLAN VI SECRETARIAL SPECIALIST (TECHNICAL)					
FIRST YEAR			SECOND YEAR		
No.	Course	Credit Hours	No.	Course	Credit Hours
<b>First Quarter</b>			<b>First Quarter</b>		
Sec Sci 101	Typing I	2	Sec Sci 112	Personal Analysis II	1
Sec Sci 104	Shorthand I	4	Sec Sci 201	Typing IV	2
Sec Sci 107	Filing and Records Management	2	Sec Sci 207	Technical Dictation & Transc. I	4
Eng 101	Communication Skills I	3	Sec Sci 209	Secretarial Procedures I	2
Math 104	Business Mathematics I	3	D.P. 101	Introduction to Data Processing	3
Soc Sci 100	Orientation	1	Math 203	Survey of Math Concepts	2
	Elective	2		Elective	2
		17			16
<b>Second Quarter</b>			<b>Second Quarter</b>		
Sec Sci 102	Typing II	2	Sec Sci 113	Personal Analysis III	1
Sec Sci 105	Shorthand II	4	Sec Sci 202	Typing V	2
Sec Sci 108	Office Machines I	2	Sec Sci 208	Technical Dictation & Transc. II	4
Eng 102	Communication Skills II	3	Sec Sci 210	Secretarial Procedures II	2
Health Sci 102	Health Education	2	Sec Sci 221	Model Office I	2
Math 204	Business Mathematics II	3	Sci 105	Survey of Science	3
		16		Elective	2
					16
<b>Third Quarter</b>			<b>Third Quarter</b>		
Sec Sci 103	Typing III	2	Sec Sci 206	Machine Transcription	3
Sec Sci 106	Shorthand III	4	Sec Sci 212	Secretarial Procedures IV	2
Sec Sci 109	Office Machines II	2	Sec Sci 216	Technical Typing	4
Sec Sci 111	Personal Analysis I	1	Sec Sci 222	Model Office II (Salary, no credit)	0
Eng 103	Speech Communication	3		Elective	3
Psych 202	Applied Psychology 1A	3		Soc Sci Elective	3
	Elective	2			15
		17			

## NURSING

A two-year program leading to a degree of Associate Nurse. The student will receive an intensive course combining classroom work and hospital experience at Fairfax Hospital.

This program will be offered Fall, 1966.

## HEALTH SCIENCES

### Work Study Program

Students who desire training in the health sciences, such as laboratory and x-ray techniques, may arrange a work study program. This program will be conducted in cooperation with the Fairfax Hospital pending introduction of the full Nursing and Health Sciences program in the Fall of 1966.

This program must be individually arranged for each applicant. The number of students to be admitted to this program will be limited to the available work billets.

The following is the curriculum for the first year:

FIRST YEAR		
No.	Course	Credit Hours
<b>First Quarter</b>		
Health Sci 101	First Aid & Safety .....	2
Psych 102	Applied Psychology I .....	5
Eng 101	Communication Skills I .....	3
Health Sci 191	Work Study .....	5
Soc Sci 100	Orientation .....	1
		16
<b>Second Quarter</b>		
Health Sci 102	Health Education .....	2
Eng 102	Communication Skills II .....	3
Econ 106	Economics I .....	3
Health Sci 192	Work Study .....	8
		16
<b>Third Quarter</b>		
Govt 204	American Government IA .....	3
Eng 103	Speech Communication .....	3
Sec Sci 101	Typing I* .....	2
Health Sci 193	Work Study .....	8
		16

\*Typing instruction will depend upon individual student's capability.

**PRE-TECHNICAL PROGRAM**

**CURRICULUM**

The Pre-Technical program is a one-quarter course of study designed to enable those students who lack essential preparation or who desire an extensive review to become adequately prepared to enter one of the regular technical programs leading to the Associate in Applied Science Degree. Through this program an opportunity will be provided for students to raise their level of proficiency in mathematics and communications skills, to become familiar with the various technological programs, to receive extensive testing and counseling, and to have closely supervised study. Upon successful completion of this program and with the recommendation of the counselor and appropriate instructors, students will be admitted into the Associate in Applied Science Degree program. Should a student fail to satisfactorily complete the Pre-Technical program or receive recommendations, the student will be given an opportunity to enroll in a non-degree program of the College. While the credit hours set forth herein are not applicable to the required subjects within a program for the Associate in Applied Science Degree, three hours (less 1 hour orientation) can be applied to the electives in his regular program.

ONE QUARTER			
No.	Subject	Hours of Instruction Per Week	Hours Credit
Math 11	Pre-technical Mathematics	5	5
Eng. 11	Pre-technical communication skills	3	3
Tech 11	Survey of Technologies	4	2
or			
Tech 12	Introduction to Selected Technology	4	2
Soc. Sci. 100	Orientation	1	1
Math/Eng 12	Practical Work	5 )	4
	Testing and Counseling	2 )	
Elective	Typing I	5	1
			15



**Course  
Descriptions**

## ACADEMIC EDUCATION

### Mathematics

Math. 21. GEOMETRY (3)—The study of plane figures; right triangle and circles. Introduction to solid geometry.

Math. 23. ALGEBRA (3)—Basic algebraic concepts and laws, writing and solving linear and quadratic equations.

Math. 25. ELEMENTARY TRIGONOMETRY (3)—Trigonometric functions, graphic representations, logarithms, laws of sines and cosines, trigonometric equations, inverse functions, and the trigonometric form of complex numbers.

✓ Math. 101. TECH. MATH. I (3)—Equations and Formulas: Problems in Plane and Solid Mensuration; Introduction to Analytic Geometry and Graphing; Simultaneous Equations; Exponents, Radicals, and Complex Numbers; Quadratic Equations in one Unknown.

Math. 102. TECH. MATH. II (3)—Ratio, Proportion and Variation; Logarithms, Slide Rule Operations; Introduction to Trigonometry; Solution of Right Triangles; Trigonometric functions of any Angle; Solution of Oblique Triangles; Vectors.

Math. 103. TECH. MATH. III (3)—Trigonometric Identities and Equations; Trigonometric Graphing; Complex Numbers and Graphing; Sequences and Series; Analytic Geometry; Higher Degree Equations; Introduction to Calculus; Graphic Calculus.

Math. 104-204. BUSINESS MATHEMATICS I-II (3) (3)—Review of fundamental operations; preparation and use of shortcut operations, 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.

Math. 110. DATA PROCESSING MATHEMATICS I (3)—Includes basic logic, algebra with emphasis on problem solving, computation with logarithms and with numbers in bases other than 10. Three hours lecture per week. Prerequisite: Math. 101.

Math. 120. DATA PROCESSING MATH. II. (3)—A continuation of Data Processing Math I with emphasis on problem solving by computer techniques, including an introduction to Boolean Algebra. Three hours lecture per week. Prerequisite: Math. 110.

Math. 202. COLLEGE ALGEBRA (5)—Solution of simultaneous equations, complex numbers, inequalities, determinants, progressions, induction, theory of equations, and other topics.

Math. 203. SURVEY OF MATHEMATICAL CONCEPTS (2)—This course is applicable to students enrolled in the secretarial sciences. Its purpose is to familiarize them with the meanings and importance of mathematical symbols, equations, and formulas used in scientific research.

Math. 204. TECHNICAL MATH. IV (Calculus) (3)—The derivative; applications of the derivative; derivatives of trigonometric functions; integration of basic forms; the definite integral; applications of the integral; integration techniques.

### English

Eng. 101. COMMUNICATIONS SKILLS I (3)—The four basic skills, speaking, reading, writing and listening, are correlated to permit students to become proficient in basic communications.

Eng. 102. COMMUNICATIONS SKILLS II (3)—Problems in four basic skills are selected on a graduated basis to permit students to achieve greater competency in communicating his ideas and thoughts to others in a technical report through research, organization, and evaluation.



Eng. 103. SPEECH COMMUNICATIONS (3)—The development of speaking skills with emphasis upon the dual role of speech as both a speaking and a listening skill.

#### Natural Sciences

Sci. 102-103. PHYSICS I-II. (3) (2)—An elementary survey of physics, treating briefly the fundamentals of mechanics, properties of matter, heat, magnetism, electricity, sound, light and radiation.

Sci. 105. SURVEY OF SCIENCE (3)—A general course designed to familiarize the student with the basic sciences. Three hours lecture and two hours lab per week.

Sci. 201. CHEMISTRY I (2)—Properties of the elements, chemical equilibrium, solubility, ionization and phenomenon, and oxidation and reduction, Qualitative analysis in the laboratory.

#### Social Sciences

Soc. Sci. 100. ORIENTATION (1)—This course is intended to give the student the policies routine and clear understanding of what the school offers in aiding them in various ways scholastically and socially and to bring forth at intervals other points of interest.

X Psych. 102. APPLIED PSYCHOLOGY I (5)—Designed to give the student man's behavior in terms of his inherited equipment of learning, particularly learning in everyday situations; basic personality, its deviations and modifications of personality; a description and evaluation of psychological tests and measures.

Psych. 105. HUMAN RELATIONS (3)—Processes and mechanisms of adjustment. Designed to give the student insight into human nature to help him understand his own behavior and the behavior of others. Emphasis on perception, intelligence, learning, memory, motivation, personality, psychological measurement, problems of adjustment.

(103) X Psych. 202. APPLIED PSYCHOLOGY IA (3)—Same as 102 but with less detail. Does not include tests and testing procedures.

Psych. 203. SUPERVISORY TRAINING (3)—Human relations as they relate to the supervisor and his job of getting work done through people; developing an understanding of people's behavior in work groups; behavior problems; motivation; discipline; and developing a better understanding of supervisory and management problems in modern industry are all included in this course.

Hist. 103. HISTORICAL DEVELOPMENT OF THE UNITED STATES AND VIRGINIA (5)—A study of events in the historical development of the United States and the state of Virginia, showing the relationship between them as well as their effects on the trends of today.

Govt. 104. AMERICAN GOVERNMENT I (5)—Theory and general character of American government, including the functions of national, state, and local governmental bodies.

Govt. 204. AMERICAN GOVERNMENT IA (3)—Same as 104 but in less depth.

Econ. 106. ECONOMICS I (3)—A survey course in economic principles and institutions with special emphasis upon basic economic concepts; national income, its measurement, its determination and fluctuation from the separate viewpoints of both income and monetary analysis and their synthesis; and fiscal policy.

Econ. 107. ECONOMICS II (3)—A continuation of Economics I with emphasis upon allocation and pricing of the national output under various market conditions for momentary, short-run, and long-run periods of time; distribution and factor pricing; inter-

national trade and finance; and such current economic problems as: technology, war and defense, growth and development, and alternative systems of economics.

Econ. 206. INDUSTRIAL ECONOMICS (3)—Industrial Economics is designed to develop a student's appreciation of the political and economic forces responsible for the growth and the development of industry and technology; economics of production, land, labor and capital; laws of supply and demand; prosperity and depression cycles; labor's effects upon economics, including the historical development of organized labor.

## OCCUPATIONAL EDUCATION

### DATA PROCESSING TECHNOLOGY

D. P. 101. INTRODUCTION TO DATA PROCESSING PRINCIPLES (3)—An introduction to basic methods, techniques and systems of manual, mechanical, and electronic data processing. Covers the history and development of data processing, manual and machine accounting equipment and systems, punched-card data processing, punched tape or integrated data processing, and electronic or automatic data processing. Three hours lecture and demonstrations per week.

D. P. 102. UNIT RECORD PROCESSING EQUIPMENT I (3)—Basic operation and control of data processing machines other than electronic digital computers. The machines include card punch, verifier, sorter, collator, document originating machine, accounting machine and interpreter. Actual experience provided with the equipment in the NVTC Data Processing Center. Three hours lecture, two hours lab per week.

D. P. 103. UNIT RECORD PROCESSING EQUIPMENT II (2)—A continuation of the Unit Record Processing Equipment course. More comprehensive exercises are executed, involving the planning and wiring a range of unit record equipment. Particular emphasis is placed on the accounting machine. Actual experience is provided with the equipment in the NVTC Data Processing Center. Two hours lecture and two hours lab per week.

D. P. 110. KEY PUNCH OPERATION (15)—A comprehensive occupational course designed to train the student to an employable level as a key punch operator in twelve weeks. In addition to the development of keyboard competency, this course includes an introduction to data processing principles. Practice is given on the wide variety of practical source material the prospective key punch operator is likely to encounter on the job. This class will meet six hours per day for 12 weeks in a combination of lecture and laboratory experience. Prerequisite: Typing skill of 30 wpm.

D. P. 111. COMPUTER PROGRAMMING I (3)—A basic course in programming electronic digital computers for those who plan to be programmers, computer operators, or those whose work may be closely related to computer applications in business and industry. Course covers problems of data processing, characteristics of computers, and computer programming or coding, in both machine language and symbolic programming techniques. Three hours lecture and two hours lab per week. Prerequisites: D. P. 101 and Math. 101.

D. P. 112. COMPUTER PROGRAMMING II (3)—A continuation of the basic computer programming course. The major emphasis is placed on the development of programming techniques. Symbolic programming will be continued. Students should become proficient in programming of card-system problems. Three hours lecture and two hours lab per week. Prerequisite: D. P. 111.

D. P. 113. COMPUTER PROGRAMMING III (3)—This course will introduce the student to concepts of utilizing a random access storage device, and the programming techniques required in using the device properly. He will reinforce and extend the programming techniques by additional "hands-on" practice in the NVTC Data Processing Center. Three hours lecture and two hours lab per week. Prerequisite: D. P. 112.

D. P. 114. COMPUTER PROGRAMMING IV (3)—Advanced course in electronic digital computer programming including advanced techniques, symbolic and macro programming and program timing and planning. Principles of magnetic tape and random access programming. Accounting, auditing and data protection are included in computer applications. Three hours lecture and two hours lab per week. Prerequisite: D. P. 113.

D. P. 115. COMPUTER PROGRAMMING V (3)—A study of advanced programming systems such as COBOL, FORTRAN, Report Program Generators, Sort systems, utility programs, and monitor systems. The student will gain some proficiency in the use of these systems and will understand the advantages and disadvantages of their use in medium and large scale computers and their integration into the total operating system. Three hours lecture and two hours lab per week. Prerequisite: D. P. 114.

D. P. 121. DATA PROCESSING APPLICATIONS I (3)—Designed to introduce the student to the basic concepts, objectives and general approaches to typical data processing applications, including: accounts receivable, accounts payable, payroll and inventory control. Practical laboratory experience is provided on the punched card equipment of the NVTC Data Processing Center. Two hours lecture and three hours lab per week. Prerequisite: D. P. 103.

D. P. 122. DATA PROCESSING APPLICATIONS II (3)—Designed to introduce the student to computer solutions of data processing applications. Practice problems will include combined applications in a simulated business. Installation management principles will be taught. Two hours lecture and three hours lab per week. Prerequisite: D. P. 112.

D. P. 123. DATA PROCESSING ACCOUNTING (3)—This course emphasizes uses of accounting information as a source of financial data for management control. Accounting services are shown in relation to their contribution to the recognition and solution of a management problem. Basic cost accounting principles are included. The concepts of performing accounting services on data processing machines are emphasized throughout the course. Three hours lecture per week. Prerequisite: Bus. Sci. 106.

D. P. 221. SYSTEMS DEVELOPMENT AND DESIGN I (3)—Designed to guide the student through the stages of the evolution of a system, the analysis of present information flow, system specifications and equipment selection, and implementation of the system. Emphasis is given to procedure writing and work simplification. Three hours lecture per week. Prerequisite: D. P. 112.

D. P. 222. SYSTEMS DEVELOPMENT AND DESIGN II (3)—This course concentrates on the techniques of the systems specialist. Various forms of systems charting are included, such as forms flow charts, process flow charts, organization charts, physical layout flow charts, and work distribution charts. Specialized systems will be introduced such as "PERT" and their evolutionary stages. Company Systems manuals will be dis-

cussed pro and con. Techniques of forms design will be included. Three hours lecture. Prerequisite: D. P. 221.

D. P. 223. SYSTEMS DEVELOPMENT AND DESIGN III (3)—A continuation of the study of systems development. A comprehensive systems problem will be presented requiring the student to develop the problem definition, data flow and procedures, design report forms, card layouts, develop test data, wire control panels, write programs and properly document all aspects of the system. Two hours lecture and two hours lab per week. Prerequisite: D. P. 222.

D. P. 234. INTRODUCTION TO ENGINEERING APPLICATIONS (3)—The student will be introduced to the basic engineering and scientific computing applications, learning to use FORTRAN programming language to solve these problems. Three hours lecture and two hours lab per week. Prerequisite: Math. 120 and Sci. 105 or equivalent.

D. P. 299. DATA PROCESSING FIELD PROBLEM (3)—A field project in which the student will be directed through a real data processing problem in business or industry, or a special problem developed by the instructional staff. The student will develop the solution from problem definition through implementation. One hour control class per week. Prerequisite: D. P. 223.

## ENGINEERING DESIGN

Engr. Dsn. 101. MECHANICAL DRAFTING I (3)—Basic understanding of orthographic projection; skill in orthographic, isometric, and oblique sketching and drawing; ability to produce accurate and complete detail and assembly work drawings, understanding of principles and appropriate application of descriptive geometry; experience in use of handbooks; elementary understanding of design principles in machine parts used as drawing projects and use of simplified drafting practices in industry. Interpretation of industrial sketches and prints.

Engr. Dsn. 102. MECHANICAL DRAFTING II (3)—Continuation of Engr. Dsn. 101. Provides additional understanding of drafting problems, skills, and techniques that are essential to the work of the draftsman; emphasizes design applications; introduces several specialized drafting areas. Units dealing with gears, cams, jigs and fixtures pave the way for depth instruction in second year design courses. Prerequisite: Engr. Dsn. 101.

Engr. Dsn. 103. MECHANICAL DRAFTING III (3)—Continuation of Engr. Dsn. 102 and advancing into Design Problems. Student will analyze the problem, collect data, make mathematical calculations, complete drawings, check out work. Encouraged to use his own judgement and work through problems. Prerequisite: Engr. Dsn. 101, 102.

Engr. Dsn. 104-105 METHODS OF MANUFACTURING I-II (3) (3)—Provides background of knowledge covering various manufacturing materials and the fundamental manufacturing methods as employed in cold working processes, practical application of various types of machine tools, tooling, measuring and inspection procedures. Automation and numerical control for machine tools: uses of transfers and special machines. Prerequisite: Consent of Dept. Head.

Engr. Dsn. 106 MATERIALS OF INDUSTRY (3)—Study of the five general classifications of materials and their application to industrial uses. Special emphasis on new materials developed through technological advances.

Engr. Dsn. 107 STRENGTH OF MATERIAL (2)—Study of internal stresses and deformation of elastic bodies resulting from the action of external forces. Analysis of simple and combined stresses and properties of materials to meet functional requirements in design. Strength of such elements as riveted joints, beams, columns, shafts and keys are determined.

Engr. Dsn. 210. METALLURGY (2)—Fundamentals of metallurgy, grain size, effect of carbon content and hardness testing devices. Different alloys will be tested to determine the effect of heat treating.

Engr. Dsn. 299 FIELD PROJECT (2)—Student will be required to design a project within his technology — making the mathematical computations, completing drawings and executing all working plans, checking out his own problems and using his own judgment and initiative in seeing through this project. This is a final requirement within the Engineering Design program.

### ELECTRONICS TECHNOLOGY

Elec. 101. ELECTRONIC DEVICES (4)—A course concerned with how electronic devices work and the characteristics of these devices. Both tube and solid state device characteristics are covered. This course utilizes the mathematical tools as they become available and the ideas of electronic flow and circuit analysis as they are developed in the fundamentals of electricity course.

Elec. 102. FUNDAMENTALS OF ELECTRICITY (3)—A study of current flow and direct current circuits. The course presents work with magnetic circuits and introduces time varying currents. This course utilizes mathematical tools as they are developed in the mathematics course.

Elec. 103-104 INTRODUCTION TO CIRCUIT ANALYSIS & CIRCUIT ANALYSIS (2) (3)—A study of the fundamentals of electricity emphasizing A.C. circuit theory and both A.C. and D.C. network theorems. Course provides a continuation of study of background information needed to analyze complex networks with both active and passive elements present.

Elec. 105. FUNDAMENTALS OF ELECTRONICS (3)—Operating principles of transistors and thermionic tubes and the application of these devices as elementary amplifiers. Included are special tube types such as cathode-ray, gas-filled and photo-tubes. Prerequisite: Elec. 101 and 102.

Elec. 106. ELECTRONIC AMPLIFIERS (5)—A continuation of electronic devices in that many of the devices studied in the first semester are used in forming amplifier circuits. Amplifiers, both transistor and tube types, are covered, with emphasis on methods of analysis and design procedures. A student should be capable of limited design of amplifiers to specifications using either tubes or transistors upon completion of this course. Prerequisite: Elec. 101.

Elec. 201-202. INSTRUMENTS & MEASUREMENTS I & II (3) (2)—A study of basic circuits used in electronic measurements and application of these circuits in test instruments such as oscilloscopes, vacuum tube voltmeters, and bridges. Further study concerned with the accuracy of measurements, how instruments work, proper use of instruments, and calibration techniques. Emphasis is placed upon how to use and calibrate general laboratory equipment. In addition; measuring methods and techniques for all frequency ranges are covered. Prerequisite Elec. 106.

Elec. 203. COMMUNICATION CIRCUITS I (2)—Study of transmitters and receivers. Included are amplifiers and oscillators, A.M. and F.M. modulation and detection, pulse modulation, and basic principles of television. Prerequisite: Elec. 106.

Elec. 204. COMMUNICATIONS CIRCUITS II (3)—A study of UHF, and VHF components, circuits and measurement techniques. The course includes the use of distributed constant elements, waveguides, microwaves, links and an introduction to radar and similar systems.

Elec. 205. COMMUNICATION SYSTEMS (4)—This is a continuation of the communication circuits course covering transmitters, receivers, transmission lines, antennas and introducing microwave systems. Primarily, this course treats systems used to transmit information from one point to another, using radio frequency techniques.

Elec. 206. INDUSTRIAL CONTROL (4)—The principles and applications of electrical controllers are covered in this course, which serves as an introduction to Automation. Devices for differentiation, integration and proportioning are studied in detail. Hardware and circuitry for AC and DC industrial control devices including contractors, starters, speed controllers, time delays, limit switches and pilot devices. Application in the control of industrial equipment—motors, servo units, and motor-driven actuators.

Elec. 207. CONTROL CIRCUITS AND SYSTEMS (4)—Various control circuits, commonly employed in industry, are investigated. These circuits are then used in systems and modern methods of systems analysis and are used to predict the performance of a complete system.

Elec. 208. INTRODUCTION TO COMPUTERS (5)—A general introduction to the concepts and basic features of electronic computers. Topics include: fundamentals of internal operations, number systems, digital circuits, Boolean algebra, programming, basic logical design techniques, analysis of input-output devices, control and arithmetic units, memory units, and associated theory.

Elec. 209. ELECTRONIC DESIGN AND FABRICATION (2)—The total effort of this course is directed toward teaching proper chassis layout and equipment packaging. Machine tools must be used in much of this fabrication so machine tool usage is covered. Modern printed circuit layout and fabrication are covered.

Elec. 210. INTRODUCTION TO NEW ELECTRONIC DEVICES (2)—This is a unique course since it depends so heavily upon the rapidly changing developments in industry. It may be noted that a few of the topics appearing in the list for this course are contained in the curriculum (such as tunnel diodes, and field effect transistors).

## DRAFTING

Draft. 101. DRAFTING I (8)—A beginning course for students who have had little or no previous experience in drafting. The principal objectives are: use of basic drawing instruments and aids; lining and lettering free-hand and use of lettering aids; dimensions and labeling; sectioning and projection; planes and revolution; threads and bolts; fasteners and springs; oblique sketching and drawing; reading intermediate drawings and prints; ability to produce accurate and complete detail and assembly drawings.

Draft. 102. DRAFTING II (8)—This course is a continuation of Draft. 101. The instructional units provide additional understanding of drafting problems, skills and techniques that are essential to the work of the draftsman. General drafting areas are introduced. Emphasis is placed on familiarity with simplified drafting practices, ability to use handbooks and other source materials and the development of skill in sketching. Prerequisite: Draft. 101 or comparable skills.

Draft. 103. DRAFTING III (8)—This course is a continuation of Draft. 102. Emphasis is placed on interpretation of industrial prints, adherence to American Standards for drafting, and development of drafting skills. Further instruction is given in architectural and structural drawing; electrical-electronics drafting; and perspective drawing. Charts, graphs, and tables. Prerequisite: Draft. 102.

Draft. 199. FIELD PROJECT (2)—This is a practical work project where the student will complete an assigned project. The project will require the utilization of the drafting skills required of a junior draftsman.

Draft. 201. DRAFTING (ELECTRONICS) (2)—An elementary course designed for students in the Electronics Program who have limited drawing experience. The course will emphasize the use of tools and templates; fundamentals of drafting room practices; electrical circuit drawing, terms, symbols and standards. Lecture and laboratory.

### BUSINESS SCIENCES

Bus. Sci. 101. INTRODUCTION TO BUSINESS (3)—An orientation course designed to give the student a general acquaintance with all types of business. The various phases of business are studied from the operational point of view.

Bus. Sci. 102. BUSINESS ORGANIZATION & MANAGEMENT (3)—This is to familiarize the student with the concepts and structure of American business. The organization and functions of the major departments in an enterprise, the levels of responsibility in management, and the basic economic factors involved in a profit making enterprise.

Bus. Sci. 103. OFFICE PROCEDURES (2)—This course is designed to enable the student to understand general office routines; such as, work flow, filing communication systems, time scheduling, etc.

Bus. Sci. 104. BUSINESS LAW I (3)—This is an introductory course with major emphasis being placed upon the study of contracts and sales, other topics are covered by lectures and class discussion. Through the use of case method, attention is given to logical reasoning and the application of rules of law to everyday affairs in business.

Bus. Sci. 105-106. PRINCIPLES OF ACCOUNTING I-II (3) (3)—A course designed to give an understanding of the fundamentals of accounting and of modern business procedures. Content includes the accounting cycle, journals, ledgers, working papers, and the preparation of financial and operating statements for a sole proprietorship, partnerships, and corporations.

Bus. Sci. 201. INTRODUCTION TO STATISTICS (3)—This course covers the collection, tabulation, and graphic presentation of data, average and index numbers, economic trends and cycles, correlation, and the application of these methods to the solution of practical business problems.

Bus. Sci. 202. BUSINESS FINANCE (3)—An introduction to the problems involved in the use and procurements of funds necessary for the successful conduct of business. The course covers sources and instruments of finance, financial organization, financing operations, growth, readjustments, bankruptcy.

Bus. Sci. 203. PERSONNEL MANAGEMENT (2)—A course in the principles and human relations problems involved in the administration of personnel. The organization and objectives of personnel departments. Building and maintaining work teams. The factors of organizational stability. An appraisal of the position of labor in business today.

Bus. Sci. 204. BUSINESS LAW II (3)—This course covers principles of agency, including rights and liabilities of agent, principal and third parties; formation of partnerships, the powers and liabilities of partners before and after dissolution of the partnership, the formation and management of corporations, the rights and liabilities of stockholders and dissolution of corporations; legal aspects of negotiable instruments and securities, including stocks, bonds, notes, commercial paper and checks.

Bus. Sci. 205-206. INTERMEDIATE ACCOUNTING I-II (3) (3)—Preparation and analysis of special financial statements and an advanced treatment of accounting for corporations. Prerequisite: Bus. Sci. 112.

Bus. Sci. 207. MONEY AND BANKING (3)—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.

Bus. Sci. 208. MERCHANDISING (MARKETING) (3)—A course in the principles, methods and problems of marketing, involving the distribution of goods. It includes a study of the various marketing agents; the wholesaler, broker, sales agent, cooperative marketing, direct marketing, and trade associations. Discussions of present-day problems and policies connected with the distribution of commodities, price factors; advertising costs; buying motives.

Bus. Sci. 209. COST & TAX ACCOUNTING (3)—Accounting for production management, job order and process cost accounting; also theory and procedure of federal income tax regulations.

Bus. Sci. 210. AUDITING (3)—Purposes of audit, relationship of auditor with client, kinds of audits, working papers, internal control and examination of accounting systems and procedures.

Bus. Sci. 211. BUSINESS TAXES (3)—Study of Federal, State and local taxes and the effects on various types of business.

Bus. Sci. 212. OFFICE MANAGEMENT (3)—An analysis is made of the functions of various office departments, their organization, and management. Methods used in selecting and training office personnel, office planning and layout, and methods and devices used to improve operating efficiency are studied.

Bus. Sci. 213. PUBLIC RELATIONS (2)—Public Relations is the study of public attitudes and their effect in industry, education, government and the community. This course surveys this fast-growing field and discusses employment opportunities in it, as well as techniques involved in measuring and maintaining favorable attitudes. Lectures and the case method are used to study public relations problems.

Bus. Sci. 214. SMALL BUSINESS RECORDS (3)—Principles of bookkeeping systems in relation to small businesses.

Bus. Sci. 215. STATISTICS II (3)—A study of statistical and probability techniques and their use. Specific topics include probability concepts density functions, graphical aids, correlation and analysis variance; statistical distributions, significance tests in evaluating and graphical solutions.

Bus. Sci. 216. OFFICE MACHINES (3)—A course to develop proficiency in the use of the various types of machines used in the modern office.

Bus. Sci. 217. REAL ESTATE & PLANT MANAGEMENT (3)—Practical application of real estate principles. Contracts, deeds, mortgages, bonds, leases, liens, search, real property insurance and appraising. Control and management of industrial and commercial property.



Bus. Sci. 218. PRINCIPLES OF SUPERVISION (3)—The course is designed to train the individual for the supervising of others and coordinating the flow of work among subordinates.

Bus. Sci. 299. SEMINAR (2-4)—A study of the techniques for obtaining employment, improving one's position after he gets the job, and a general discussion of professional ethics.

### POLICE SCIENCE AND PROCEDURES

Pol. Sci. 101. INTRODUCTION TO LAW ENFORCEMENT (3)—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.

Pol. Sci. 102. CRIMINAL LAW (3)—The structure, definitions, and the most frequently used sections of the Penal Code and other criminal statutes.

Pol. Sci. 103. FUNDAMENTALS OF INVESTIGATIVE TECHNIQUES (3)—The basic skills necessary for modern criminal investigation, including the discovery, development, and lifting of latent fingerprints, the making of crime scene sketches, the use of plaster and silicone rubber for reproducing evidence at crime scenes, the use of modern investigative aids, and a grounding in the modern techniques of criminal interrogation.

Pol. Sci. 104. FIREARMS I (3)—The moral aspects, legal provisions, safety precautions and restrictions covering the use of firearms; care, assembling and disassembling of rifle and sidearms.

Pol. Sci. 105-205. DEFENSE AND SUBDUAL I-II (2) (2)—Protection against persons armed with dangerous and deadly weapons; demonstration and drill in a limited number of holds and come alongs; restraint of prisoners and the mentally ill; fundamental use of the baton. Meets state requirement in Physical Education.

Pol. Sci. 106. DUTIES AND PROCEDURES OF AN OFFICER (3)—Responsibilities, techniques, and methods of police patrol.

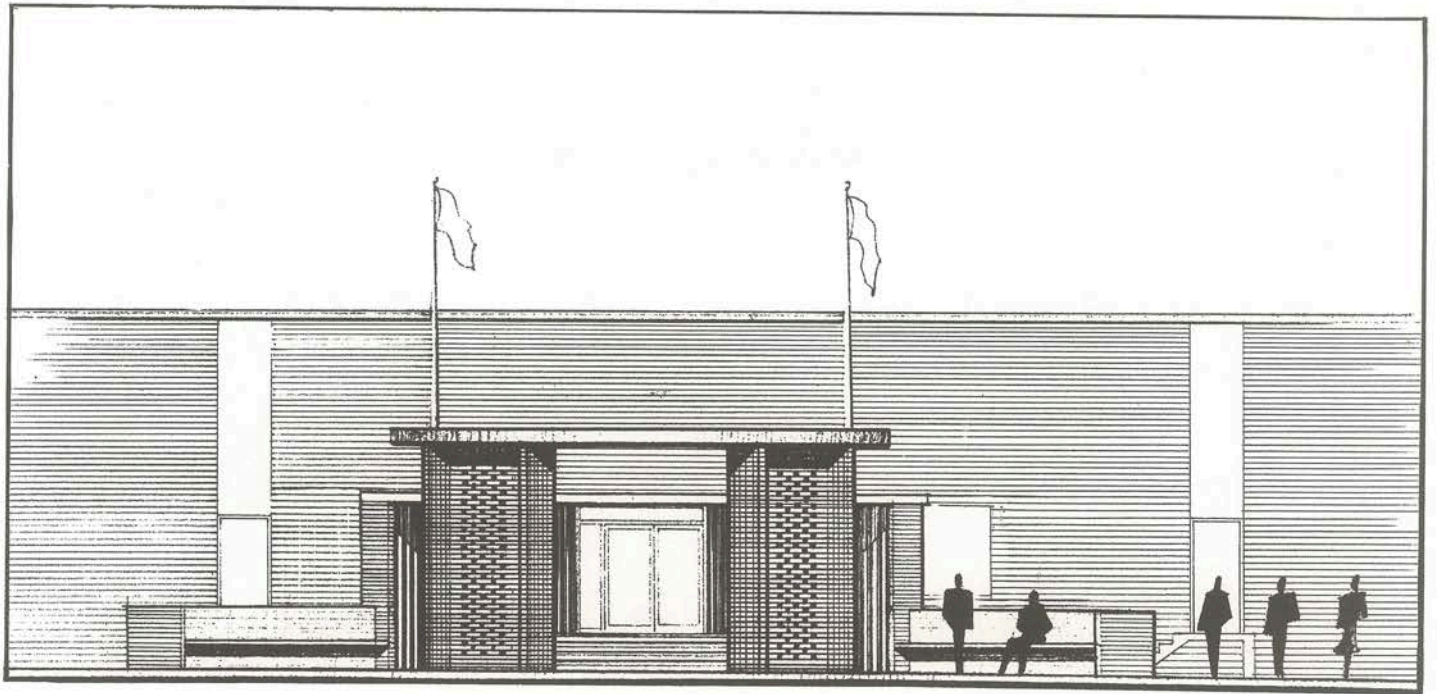
Pol. Sci. 107. TRAFFIC FLOW AND CONTROL (3)—Virginia Vehicle Code and related laws; routine traffic duties of a law enforcement officer; limited auto mechanics trouble shooting to assist and speed movement of persons in disabled cars; principles of accident investigation and reports; and duties of a police officer in special situations such as fires, parades, etc.

Pol. Sci. 108. ELEMENTARY PHOTOGRAPHY (2)—Fundamentals of photography; application of the camera; photographic optics; photographic chemistry; developing, printing, and enlarging; mechanical skills and processes, course stresses fact finding and evidence. Field photography.

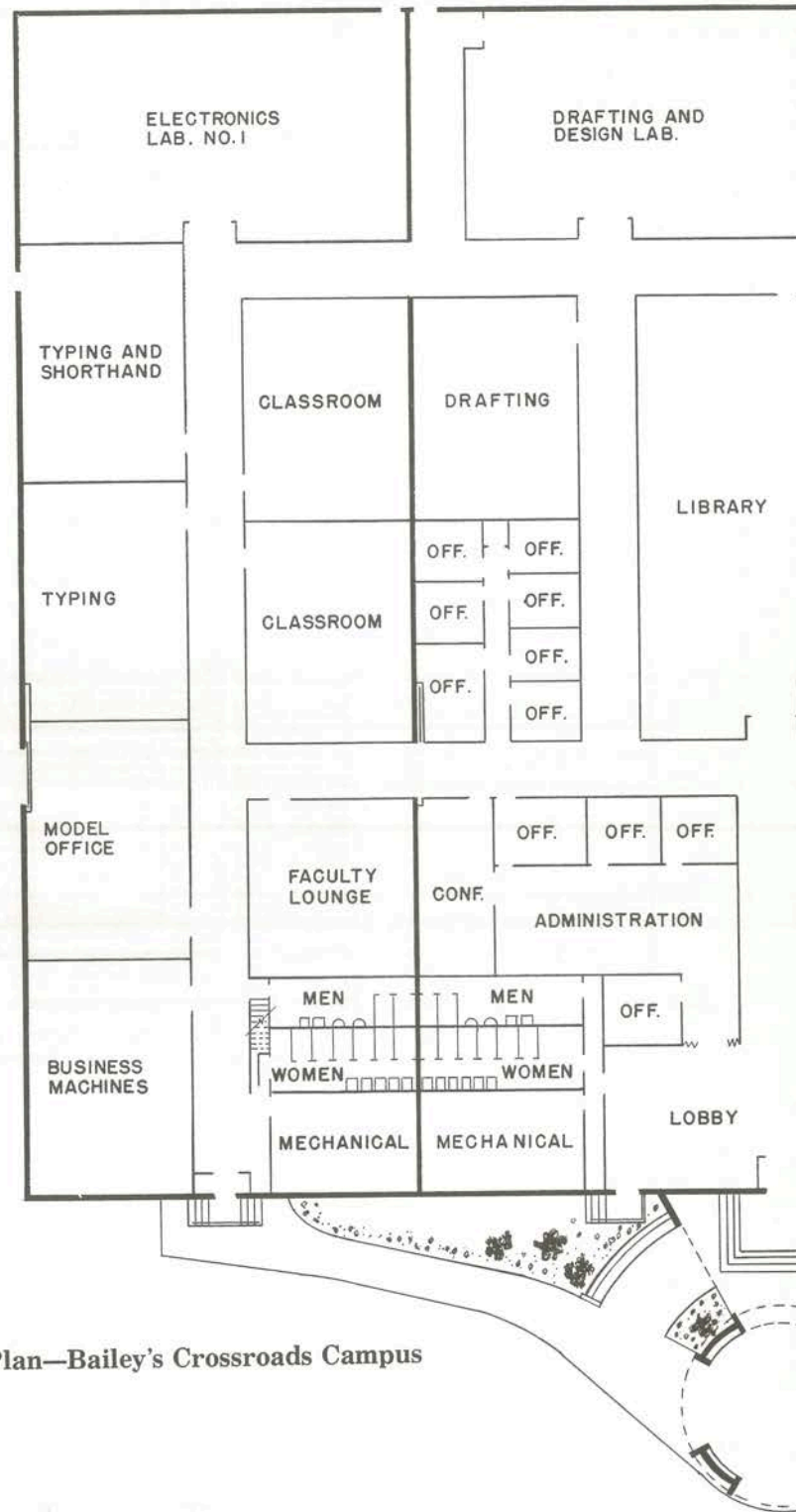
Pol. Sci. 109. ADMINISTRATION OF JUSTICE (3)—Review of court systems; procedures from incident to final disposition; principles of constitutional, federal, state and civil laws as they apply to and affect law enforcement.

Pol. Sci. 201. CRIMINAL EVIDENCE (3)—The kinds and degrees of evidence and the rules governing the admissibility of evidence in court. Interrogation training in the theory and principle of scientific instrumental detection of deception.





Front Elevation—Bailey's Crossroads Campus



Floor Plan—Bailey's Crossroads Campus

