SALEM

TECH

1962-64 Catalog

SALEM

TECHNICAL VOCATIONAL

SCHOOL

1105 Third Street, N.W.

Salem, Oregon

CATALOG 1962 - 1964

A Public Area Education Center Serving

MARION, LINN, and POLK COUNTIES

School District 24 CJ

Board of Education

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CHARLES D. SCHMIDT, Superintendent
Salem Public Schools

PAUL F. WILMETH, Supervisor
Technical Vocational Education

Academic Calendar

FALL TERM - 1962-63

Sept.	19-21	(Wed.-Friday)	New Student Orientation
Sept.	19-21	(Wed.-Fri.)	Registration
Sept.	24	(Mon.)	Classes in regular session
Sept.	25	(Tues.)	Last day to register without penalty
Oct.	3	(Wed.)	Last day to register
Nov.	1- 2	(Thurs.-Fri.)	Mid Term Tests
Nov.	7	(Wed.)	Last day to drop courses. See grading system
Nov.	22-25	(Thurs.-Sun.)	Thanksgiving Vacation
Dec.	10-12	(Mon.-Wed.)	Pre-Registration - Winter Term
Dec.	18	(Tues.)	Last day of classes
Dec.	19-20	(Wed.-Thurs.)	Final Examinations
Dec.	21	(Fri.)	Last day of Fall Term

WINTER TERM - 1962-63

Jan.	2	(Wed.)	Registration
Jan.	2	(Wed.)	Classes in regular session
Jan.	10	(Thurs.)	Last day to register without penalty
Jan.	18	(Fri.)	Last day to register
Feb.	4- 5	(Mon.-Tues.)	Mid Term Tests
Feb.	8	(Fri.)	Last day to drop courses. See grading system
Mar.	6- 8	(Wed.-Fri.)	Pre-Registration for Spring Term
Mar.	18-19	(Mon.-Tues.)	Final Examination
Mar.	19	(Tues.)	Winter Term ends
Mar.	20-24	(Wed.-Sun.)	Spring Vacation

SPRING TERM - 1962-63

Mar.	25	(Mon.)	Registration
Mar.	25	(Mon.)	Classes in regular session
Apr.	2	(Tues.)	Last day to register without penalty
Apr.	12	(Fri.)	Last day to register
Apr.	29-30	(Mon.-Tues.)	Mid Term Tests
May	30	(Fri.)	Last day to drop courses. See grading system
May	28-31	(Tues.-Fri.)	Pre-Registration
June	5- 6	(Wed.-Thurs.)	Final Examination
June	7	(Fri.)	Spring Term ends
June	7	(Fri.)	Graduation Exercises

FALL TERM - 1963-64

Sept.	18-20	(Wed.-Fri.)	New Student Orientation
Sept.	18-20	(Wed.-Fri.)	Registration
Sept.	23	(Mon.)	Classes in regular session
Sept.	24	(Tues)	Last day to register without penalty
Oct.	2	(Wed.)	Last day to register
Oct.	31-Nov. 1	(Thurs.-Fri.)	Mid Term Tests
Nov.	6	(Wed.)	Last day to drop courses. See grading system
Nov.	21-24	(Thurs.-Sun.)	Thanksgiving Vacation
Dec.	9-11	(Mon.-Wed)	Pre-Registration - Winter Term
Dec.	17	(Tues.)	Last day of classes
Dec.	18-19	(Wed.-Thurs.)	Final Examinations
Dec.	20	(Fri.)	Last day of Fall Term

Table of Contents

Faculty

BLANK, Franklin W., Jr. (1961)
B.A. *Business Administration, Willamette University* 1953. Nine years experience Business and Personnel Management.

BOONE, J. H. (1958)
Santa Monica City College, UCLA, Oregon State University. Five years industrial experience in drafting and instrumentation.

BRADSHAW, James C. (1961)
B.A. Economics, Willamette University, 1953. *Seven years experience* as auditor, State Tax Commission; two years experience as Management Analyst, State Board of Control.

CHADWICK, Patricia (1960)
Diploma, Providence Hospital School of Nursing, Portland, Oregon, 1956. Two years nursing experience, and three years hospital teaching.

CIRCLE, Melvin W. (1957)
Sacramento Junior College, Capitol Radio Engineering Institute, Oregon State University. 10 years experience in radio-TV service, 8 years experience in Electronics and five years experience as Instructor in Electronics.

CLARK, Robert R. (1931)
B.S. Business Administration, Oregon State University. Experience with Public Utility Commissioner of Oregon in Transportation and Utility Auditing, Cost Accounting, Finance and Economic Research.

CROSSLAND, Ronald (1959)
B.A. Economics and Business Administration, Willamette University, 1937. Twenty-five years experience in business as Division Office Manager, Portland General Electric.

REIG, Helen, R. N. (Mrs.) (1959)
B. S. Education and Science Major, Oregon State University. R.N. at Stanford University School of Nursing. Experience as office nurse, general and private duty, industrial nursing, and instructor of nursing. Oregon State TB Hospital In Service Instructor.

LISTELLA, Guido (1960)
B. A. and M. A. University of Akron, Akron, Ohio. Psychology, 1954. Six years experience as Staff psychologist.

PEER, Donald F. (1962)
B.A. Political Science, Public Administration, University of Oregon, 1958. Four years industrial experience; two years Personnel Analyst, and one year Assistant Classification Supervisor with Oregon State Civil Service Commission.

POMEROY, Vivian, R. N. (Mrs.) (1959)
Diploma, Charity Hospital School of Nursing, New Orleans, Louisiana. Experience as Associate Instructor Nursing Arts, Superintendent of Nurses, and Instructor Supervisor. Salem General Hospital In Service Instructor.

REYNOLDSON, Harold (1961)
B.A.Linfield College, 1951 Education, Mathematics, and Science. Ten years experience with State Highway Department.

RICE, Leonard (1960)
B. S. Industrial Art Education, Oregon State University, 1959. Four years industrial experience, three years as Senior Draftsman.

SHATTUCK, F. Gordon (1959)
B.S. Mechanical Engineering, Oregon State University, 1933. Twenty-two years in State Service, with Department of Employment, Public Utility Commission.

SHEPHERD, Robert M. (1959)
B. A. Business Administration, major in labor relations, 1946, University of Washington; one year employee relations supervisor, ten years classification Supervisor in State Civil Service.

TEBEAU, William H. (1957)
B. E. Chemical Engineering, Oregon State University, 1948. Registered Professional Engineer, 1956. Twelve years experience highway construction and design.

TRENT, Richard W. (1958)
Oregon State University. Ten years industrial experience in machine and metal fields.

WILMETH, Paul F. (1952)
B. E. Oregon State University, 1957. M. E. Oregon State University, 1960. Eight years industrial experience, four years teaching, twelve years in Technical Vocational Education.

ZARKOWSKI, Frank (1961)
B.S. Oregon State University, 1958; M.E. Oregon State University, 1960. Four years Flight Engineering USAF. Three years Instructor Oregon Technical Institute.

BERSTECHER, Erna, R. N. (Miss) (1960)
Diploma, Evangelical Deaconess Hospital, Chicago. Experience in pediatrics, Mental health and Public Health. Marion County Public Health Instructor.

MacLEAN, Marion, R.N. (Miss) (1957)
Diploma, New Hampshire Memorial Hospital Training School. Experience includes administration, supervisor, training director. In Service instructor Salem Memorial Hospital.

Salem Technical School Advisory Committee Members

nderson, John A. - Civil Structural Engineering Technician, Drafting
Baker, George - Civil Structural Engineering Technician, Drafting
Berg, Norman - - - Electronics Engineering Technician
Branson, A. C. - - - - - - - Practical Nursing
Brooks, Dean (Dr.) - - - - - Practical Nursing
Christenson, Robert - - Electronics Engineering Technician
Dockham, Dave - Civil Structural Engineering Technician, Drafting
Doucette, Betty, R. N. (Mrs.) - - - - Practical Nursing
Fields, Gene - - - - Electronics Engineering Technician
Gaver, Kenneth (Dr.) - - - - - Practical Nursing
Giroux, Joseph - - - - Data Processing Technology
Hall, Frank L. - - - - Highway Engineering Technician
Head, Al J. - - - - Highway Engineering Technician
Huntley, Gene - - - - Highway Engineering Technician
Johnson, M. G. - - - Electronics Engineering Technician
Jones, Jacqueline, R. N. (Miss) - - - Practical Nursing
LaDuke, Tom - - - - - Data Processing Technology
LeFor, Faye, R. N. (Mrs.) - - - - Practical Nursing
McIntosh, Elizabeth, R. N. (Miss) - - - Practical Nursing
Merchant, Ivan D. - - - Highway Engineering Technician
Morrow, Dwight - Civil Structural Engineering Technician, Drafting
Peer, Donald F. - - - - Data Processing Technology
Rice, Roy J. - - - - - Data Processing Technology
Richardson, Don - Civil Structural Engineering Technician, Drafting
Seamster, Esther, L. P. N. (Mrs.) - - - Practical Nursing
Van Meter, Joe - - - - Electronics Engineering Technician
Wedel, Irwin - - - - - - Practical Nursing
Wilson, Edward L. - - - - Data Processing Technology
Yeary, Bernice, R. N. (Mrs.) - - - - Practical Nursing
Young, L. H. - - - - Highway Engineering Technician

General Information

HISTORY

In 1955 the Salem Technical Vocational School was established as a po high school program to meet the increasing technical and vocational needs of Marion County and parts of Linn and Polk Counties. The school's first curriculum, February 1955, was in Machine Shop Practice. Ten full time students were enrolled. In June of 1957 the program of Practical Nursing for Licensure was opened. The Electronics Engineering Technician Curriculum was started in October of 1957 with the Civil Structural Engineering Technician being opened in November of the same year. In September of 1958, Drafting Programs were added. March of 1959 saw the first class of Highway Engineering Technicians enrolled.

The enrollment has grown from a total of 10 students in 1955 to 240 during the year 1961-62; from one program to a total of eleven curriculums, with allied and supporting courses for each.

Salem Technical Vocational School is financed by State Department of Education, local district funds, and tuition. State reimbursement for pre-employment programs is determined by the State Board of Education.

Instructors in the school are chosen for their occupational competency, formal educational background and interests. All instructors meet certification standards as set up by the State Board of Education.

Contact with occupational areas for which training is given is maintained by working closely with Advisory Committees for specific areas.

DEFINITION AND PHILOSOPHY

One of today's most rapidly growing demands on education is for techni and vocational training to support business and industry and its requirea skilled manpower needs. The Salem Technical Vocational School's purpose is to supply these demands through its one and two year post high school programs. The Salem Technical Vocational School anticipates and provides local needs with well planned and well organized occupation centered curriculums in the field of technical and vocational education.

The philosophy of the Salem Technical Vocational School is to present instruction for the preparation of students for employment in such a manner as to develop skills, abilities, understandings, attitudes, working habits and appreciations that will enable the student to assume his place in the social and economic life of our Community, State, and Nation.

In order to accomplish this, we recognize individual differences and aptitudes for training, present subject matter and practical material in a method designed for understanding by the student, and strive for the realization on the part of the student, through supporting courses, of his responsibility as a citizen.

Academic Regulations

ADMISSION

Admittance to Salem Vocational School will be granted to any person 16 years of age or older, who has completed High School requirements for a diploma or its equivalent (equivalency may be established by evaluation of experience and/or training, or by testing) ; and those who are able to benefit from specific courses.

To be admitted to a program a student must submit an application for admittance (available at the Technical Vocational School) and an official transcript of all high school and college records. Upon acceptance of enrollment application, a registration fee of $10.00 will be due which will apply to the student's tuition. The registration fee is not refundable.

ENTRANCE EXAMINATIONS

All persons applying for entrance into the Salem Technical Vocational School are required to take the entrance exam which will be scheduled at the earliest possible date after the application is submitted. These examinations indicate ability to do the work required and form a basis for counseling and guidance. Remedial programs may be required to overcome deficiencies, before entrance into certain programs will be permitted.

GRADUATION REQUIREMENTS

On or before the end of the third week of the students final term, a written application must be submitted to the Office for the Associate of Applied Science Degree or Certificate, whichever is applicable. The Associate Degree is given for satisfactory completion of the following two year Technical Curricula: Electronics Engineering, Civil and Structural Engineering, Highway Engineering, Machine Shop, Technical Drafting, Mechanical Technology, and Data Processing Technology Programs. Approval for awarding the Associate of Applied Science Degree was given the Salem Technical Vocational School by the State Board of Education.

GRADING SYSTEMS

Grades will be issued at the close of each term as indicated by the calendar. The letters, A, B, C, D, F, W, and Inc. will be used to designate relative standing in the class;*A* denotes outstanding performance; *B* of lesser excellence, but above average; *C* as average work; *D* as below average, but still passing; *W* indicates withdrawal; *F* as failure; and *Inc.* as incomplete. Withdrawal from a course may be accomplished before the date indicated on the calendar, and *W* awarded. After that date, a withdrawal becomes an *F*. Incompletes may be made up within three months after close of the term and a grade earned. If this is not done in the specified time, the *Inc.* becomes an *F*.

All work that is graded is assigned a numerical point value as follows: *A*, 4 points per term unit; *B*, 3 points per term unit; *C*, 2 points per term unit; *D*, 1 point per term unit; *F*, 0 points per term unit. The grade-point average (GPA) is the quotient of total points divided by total term units for which grades are issued. Incompletes are disregarded in the computation of grade-point averages.

SCOLARSHIP REGULATIONS

All students are required to maintain at least 2.00 GPA. Any term in which the GPA is less than that stated would mean the student will be placed on probation and will be subject to dismissal if the faculty committee feels that his work indicates he is not profiting from it. GPA of less than 2.00 would definitely be looked upon as unsatisfactory performance.

CREDIT

The specific subject matter areas in the technical programs carry weight designated in TERM UNITS of credit. A term unit represents one hour of the student's time each week for one term in a theory class or three hours in a Lab. The number of class/laboratory hours per week for any course may be found in the sequence of courses for each program of studies and in the section on course descriptions.

FEES AND TUITON

Fees and tuition vary somewhat with the Curriculum offered. In all cases fees and tuitions are established and maintained as low as possible in keeping with the type and scope of the program. All fees and tuitions are collected and deposited with the Clerk of District 24CJ. Tuition charges are $90.00 per term for full time students. Part time students pay fees based on term units, $6.00 per term unit of theory and $8.00 per term unit of lab. Tuition for practical nursing is somewhat different. (This is noted in the section describing the Practical Nursing Curriculum.)

TUITION REFUND

Students who withdraw from the school and who have complied with the regulations governing withdrawals are entitled to a partial refund of tuition paid, depending on the time of withdrawal. The refund schedule is obtainable at the time of registration. All refunds are subject to the following regulations. Any claims for refund must be in writing and submitted at time of withdrawal. Refunds in all cases are calculated from the date of application for refund and not from the date when the student ceased to attend classes, except in cases where the delay is beyond the control of the student.

PLACEMENT

An active placement policy is maintained by the school for the benefit of the graduates of our programs. Instructors in each program are in close touch with employers and job opportunities in the area. Every possible assitance will be given students completing programs and who are seeking jobs in the occupation for which they have been training.

Salem Technical School coordinates and plans employer recruitment visitations to the school for the convenience of its graduates each spring.

VETERANS

All courses listed are approved by the Veterans Administration and the State Department of Veterans Affairs for the payment of educational benefits to eligible veterans. Thirty hours per week of class time, lab time and supervised study is considered a full load for a veteran. The veteran is responsible for paying the cost of the tuition, fees, books, etc., directly to the school regardless of whether subsistence checks have been received or not. Dates for payments of costs cannot be waived because of delay in receiving benefits. Pros-

pective veteran students may receive help in submitting applications for educational benefits from either the State Department of Veterans Affairs, at 12th and Ferry Street, S.E., or County Veterans Service Officer in the Marion County Court House, Salem, Oregon.

EVALUATION

Certain courses within the curriculum may be waived if, upon evaluation of *students past experience by the* Faculty Committee, it is felt that he has covered this area. When formal credit is desired after such evaluation, an examination over the content of the waived courses would be required by complying with procedures already established for such.

Transcripts from other Post High School Institutions showing subject matter completed that compares with our offerings will be honored and credit automatically given, upon evaluation of such courses by the Faculty Committee.

TO ENROLL IN THESE PROGRAMS OR OBTAIN ADDITIONAL INFORMATION TELEPHONE OR WRITE TO

SALEM TECHNICAL VOCATIONAL SCHOOL
1105 Third Street, N.W.
Salem, Oregon

Telephone: 363-4171, Ext. 342
Evenings: 363-4176

Civil and Structural Engineering Technician

The first year (initial three terms) of the following curricula are common: Civil and Structural Technician, Highway Technician, and Civil and Structural Drafting Technology. The student thus has a choice of a major technology at the beginning of the fourth term or second year.

The objective of the Civil and Structural Program is to prepare students to meet the requirements for entrance into the various branches of employment in Civil and Structural Engineering field and for advancement in the chosen field. Graduates will find excellent opportunities for careers in the wide areas of highway, bridge, dam, and factory development and construction. Comprehensive practical training in areas of surveying, strength of materials and construction activities provide application of the theoretical and mathematical courses which are taken concurrently.

The training is sufficiently broad so that the student can use the program as a base for further study in general Civil Engineering and related work. Together with further study and sufficient experience, the graduate would have opportunity to advance to a Civil Engineering Rating while in the employ of certain federal, state, or city organizations.

On a construction project that is being planned, Civil and Structural Technicians may help in estimating costs, preparing specifications for materials, or participating in surveying, drafting, or designing work. Once the actual construction work has begun, they may assist the contractors or engineers in scheduling construction activities and inspecting the work for conformance with blueprints and specifications.

Upon satisfactory completion of the requirements in the Civil and Structural Program an Associate of Applied Science Degree will be awarded, signifying that the student is prepared to effectively function and advance in the many job areas of Civil and Structural Engineering.

Examples of opportunities are listed here:

Civil Engineering Technician	Structural Designer	Contractor's Assistant
Surveyor	Supt. of Construction	Technical Writer
Construction Foreman	Inspector	Computor
Assistant Engineer	Construction Estimator	Engineering Aide
Senior Draftsman	Cost Estimator	Instrument Man, Survey

Associate of Applied Science Degree; Minimum 103 Term Units.

Civil & Structural Engineering Technician Curriculum

FIRST YEAR

Term 1

Hours Class	Work Lab.	Course Title	Course No.	Term Units
3	2	Applied Physics	6.370	4
3		Communication Skills	1.100	3
	4	Drafting	4.101	2
	2	Engineering Problems	6.135	1
1	6	Plane Surveying	6.101	3
3		Technical Mathematics	6.261	3
				16

Term 2

	2	Engineering Problems	6.136	1
3	2	Applied Physics	6.371	4
3		Communication Skills	1.102	3
	4	Drafting	4.105	2
1	6	Plane Surveying	6.103	3
3		Technical Mathematics	6.262	3
				16

Term 3

2	3	Applied Mechanics	6.109	3
	4	Descriptive Geometry	6.927	2
1	6	Surveying Computations	6.500	3
2		Strength of Materials	6.107T	2
	3	Strength of Materials Lab.	6.107	1
3		Technical Mathematics	6.266	3
3		Technical Report Writing	6.126	3
				17

SECOND YEAR

Term 4

2		Industrial Economics	1.506	2
	4	Mapping and Computing	6.131	2
2	3	Strength of Materials	6.128	3
2	3	Applied Mechanics	6.111	3
1	3	Structural Analysis and Design	6.130	2
2		Earthwork Computations & Estimates	6.528	2
3		Introduction to Psychology	1.606	3
				17

Term 5

3		Hydraulatics	6.112	3
	6	Mapping and Computing	6.133	2
2	3	Soil Mechanics	6.124	3
3	3	Timber and Steel Construction	6.125	4
2		Construction Codes	6.122	2
3		American Institutions	1.600	3
				17

Term 6

2	5	Concrete Construction and Design	6.123	4
3		Foundations of Structures	6.120	3
3		Hydraulatics	6.144	3
	4	Structural Drafting	4.111	2
3		Contracts and Specifications	6.118	3
2		Construction Estimating	6.110	2
3		Psychology of Human Relations	1.608	3
				20

Civil & Structural Drafting Technology

The first year (Initial three terms) of the following curricula are common: Civil and Structural Technician, Highway Technician and Civil and Structural Drafting Technology. The student thus has a choice of a major technology at the beginning of the fourth term or second year.

The objective of this program is to provide proficiency and understanding in the technical requirements for a career as a design draftsman in the field of civil and structural engineering. The courses within the program were specifically selected to train technicians to qualify for the detailing and designing of the plans of construction and engineering in the civil-structural area. Practical elements of engineering, drafting, mathematics, physics, strength of materials, structural analysis, and design analysis serve to constitute a broad curriculum, without sacrificing a depth of instruction. The curriculum is centered around occupational elements that normally cannot be obtained through experience alone, elements such as: Principles of Structural Design, Strength of Materials, and certain other specialized areas.

The individuals trained in this area find careers in construction, research, and development or manufacturing fields and perform tasks such as transforming ideas into drawings or layouts; calculating strength and quality of materials; preparing complete plans and detailed drawings.

The training is sufficiently broad so that the student can use the program as a base for further study in general Civil Engineering and related work. Together with further study and sufficient experience, the graduate would have opportunity to advance to a Civil Engineering Rating while in the employ of certain federal, state, or city organizations.

Upon satisfactory completion of the requirements in the Civil and Structural Program, an Associate of Applied Science Degree will be awarded, signifying that the student is prepared to effectively function and advance in the many job areas of Civil and Structural Engineering.

Examples of opportunities are listed here:

Structural Design Technician
Technical Layout Draftsman
Topographical and Mapping Draftsman
Construction Inspector
Technical Writer
Cost Estimator
Construction Estimator

Associate of Applied Science Degree: Minimum 104 Term Units.

Civil & Structural Drafting Technology Curriculum

FIRST YEAR

Hours Class	Work Lab.	Course Title	Course No.	Term Units
erm 1				
3	2	Applied Physics	6.370	4
3		Communication Skills	1.100	3
	4	Drafting	4.101	2
	2	Engineering Problems	6.135	1
1	6	Plane Surveying	6.101	3
3		Technical Mathematics	6.261	3
				16
Term 2				
3	2	Applied Physics	6.371	4
3		Communication Skills	1.102	3
	4	Drafting	4.105	2
1	6	Plane Surveying	6.103	3
3		Technical Mathematics	6.262	3
	2	Engineering Problems	6.136	1
				16
Term 3				
3		Technical Report Writing	6.126	3
2	3	Applied Mechanics	6.109	3
	4	Descriptive Geometry	6.127	2
1	6	Surveying Computations	6.500	3
2		Strength of Materials	6.107T	2
	3	Strength of Materials Lab.	6.107	1
3		Technical Mathematics	6.266	3
				17

SECOND YEAR

Term 4				
3		Introduction to Psychology	1.606	3
2		Industrial Economics	1.506	2
2		Construction Standards	4.110	2
3		Introduction to Specifications	4.102	3
3		Industrial Safety	4.108	3
1	6	Road and Highway Drafting	4.129	3
1	7	Mapping and Platting	4.131	3
				19
Term 5				
3		American Institutions	1.600	3
2		Health Education	1.605	2
3	2	Production Planning and Practices	4.104	4
2	3	Metals Application Treatment and Testing	4.106	3
2	6	Industrial Construction Drafting	4.133	2
2		Construction Cost Computations	4.134	2
	5	Construction Cost Computations Lab.	4.135	2
				18
Term 6				
3		Psychology of Human Relations	1.608	3
3	4	Photo Interpretation and Mapping	4.112	5
	4	Structural Drafting	4.111	2
2	6	Industrial Construction Drafting	4.137	4
	4	Technical Illustration	4.127	2
2		Employer-Employee Relations	4.500	2
				18

Data Processing Technology

The objective of the Data Processing Program is to provide training for individuals preparing for positions in the various fields of Data Processi and for those persons already engaged in the field who desire further training.

The occupation-centered curriculum is designed to prepare individuals for entrance into fields such as management centers, engineering departments, and research and development areas. The technician in these areas perform many tasks; process masses of statistical data; uses computors to solve problems; writes detailed intruction for electronic devices; processes machine tool 'numerical control' data, etc.

The student receives training which is both comprehensive and of sufficient depth to meet the requirements for the many opportunities in the broad and varied field of data processing. A thorough grounding in accounting, automatic data processing, programming, and management procedures are coupled with a comprehensive practical work on the data processing machines themselves, such as the key punch, tabulating machine, automatic accounting equipment, etc.

Upon satisfactory completion of the requirements in the Data Processing Program, an Associate in Applied Science degree will be awarded, signifying that the student is prepared to effectively function and advance in the many job areas of the Data Processing Field.

Examples of opportunities are listed below:

Coders
EDPM Programmer Trainee (CS)
Machine Operator-Peripheral
Tabulating Machine Operator 1 (CS)
System and Procedures Trainee
EDP Clerk and Librarian
EDPM Programmer 1 (CS)
Peripheral Equipment Supervisor
Tabulating Machine Operator 2 (CS)
Tabulating Machine Operator 3 (CS)
Tabulating Machine Operator 1 (CS)
Machine Operators — Computor Procedures Writers
EDPM Console Operator
Scheduling Supervisor
Technical Editor
EDPM Programmer 2 (CS)
Master Programmers
Tabulating Machine Supervisor
Computer Unit Director
EDPM System Analyst 1 (CS)
Supervisor, Data Processing Machines Unit (CS)
EDPM System Analyst 2 (CS)
Senior EDPM System Analyst

Associate of Applied Science Degree: Minimum 101 Term Units

Data Processing Technology Curriculum

FIRST YEAR

Hours Class	Work Lab.	Course Title	Course No.	Term Units
erm 1				
3		Communication Skills	1.100	3
3		Mathematics	4.203	3
3	3	Accounting	6.920	4
3		Introduction to Bus. and Public Administration	2.502	3
1	3	Records and Reports	2.517	2
				15
Term 2				
2		Industrial Economics	1.506	2
3		Communication Skills	1.102	3
3	3	Accounting	6.921	4
3	2	Practical Physics	6.919	4
3		Mathematics	4.204	3
				16
Term 3				
5		Mathematics for Automatic Data Processing	6.916	5
3	3	Accounting	6.922	4
3	2	Introduction to Automatic Data Processing	6.900	4
3	3	Business Statistics	6.912	4
				17

SECOND YEAR

Term 4				
3		Introduction to Psychology	1.606	3
3		Cost Accounting	2.576	3
3	3	Introduction to Programming	6.903	4
3	3	Introduction to Electric Accounting Machines	6.913	4
3		Introduction to Systems and Procedures	6.902	3
1	3	Office Machines	2.521	2
				19
Term 5				
3		American Institutions	1.600	3
2	6	Electric Accounting Machine Operations	6.915	4
3		Automated Systems and Procedures	6.904	3
3	2	Electronic Data Processing Machine Applications	6.912	4
		Approved Electives		3
				17
Term 6				
3		Psychology of Human Relations	1.608	3
3	2	Electric Accounting Machine Applications	6.917	4
3	3	Business Management	6.908	4
		Approved Electives		6
				17

Electronic Engineering Technician

The first year (initial three terms) of the following curricula are common: Electronic Technician and Electronic-Electrical Drafting Technology. The student thus has a choice of a major technology at the beginning of the fourth term or second year.

The objective of the Electronic Technician Program is to prepare individuals for careers in the broad field of Electronics. The program was especially designed and planned to give the graduate a broad and comprehensive understanding and practical know-how, without sacrificing depth and some specialization for entrance into such areas of the electronic industry as: research and development; radio and television; micro-wave station operations and maintenance; and in commercial and domestic maintenance and many other areas using vacuum tubes and semi-conductors circuits.

The student is given a strong background in Electronics Theory, Mathematics, and Physics to enable him to handle complex technical work. The student spends the major portion of his school time gaining proficiency in the practical application of the theory; analyzing circuits; development of elementary electronic units; working with modern test and measuring equipment; trouble shooting, and evaluating operating characteristics of electronic equipment.

Electronic Technicians employed in research and development activities usually assist physical scientists and/or engineers in designing, testing, and modifying experimental electronic devices. They may be called upon to devise practical solutions to problems of design, select suitable materials, determine the best method of building a piece of equipment, and test and evaluate the operating characteristics of the electronic device. They also may be called upon to make necessary modifications in the experimental equipment.

Upon satisfactory completion of the requirements in the Electronic Technician Program, an Associate of Applied Science Degree will be awarded, signifying that the student is prepared to effectively function and advance in the many job areas of the Electronic Technology.

Examples of opportunities are listed here:

Radio Communications Technician (Aircraft, etc.)
Radio Operator and Dispatcher
Electronics Technician
Laboratory Technician (Electronic)
Electronic Instrument Technician (Mfg.)
Guided Missile Technician
Electronic Computor Technician
Microwave Radio Technician
Electronic Instrument Service Technician
Industrial Electronic Technician Supervisor
Electronic Equipment Designer
Electronic Engineering Technician

Associate of Applied Science Degree: Minimum 102 Term Units

Electronic Engineering Technician Curriculum

FIRST YEAR

Term 1

Hours Class	Work Lab.	Course Title	Course No.	Term Units
3	2	Applied Physics	6.370	4
3		Communication Skills	1.100	3
	4	Drafting	4.101	2
	2	Engineering Problems	6.135	1
3		Technical Mathematics	6.261	3
3	2	Electrical Theory DC	6.200R	4
				17

Term 2

3	2	Applied Physics	6.371	4
3		Communication Skills	1.102	3
	4	Electrical Drafting	4.103	2
	2	Engineering Problems	6.136	1
3		Technical Mathematics	6.262	3
3	2	Electrical Theory AC	6.202R	4
				17

Term 3

3		Technical Report Writing	6.126	3
	4	Practical Descriptive Geometry	6.127	2
3		Technical Mathematics	6.266	3
3		Electrical Circuits	6.204R	3
	6	Electrical Circuits (Lab.)	6.205R	2
3		Vacuum Tube and Transistor Analysis	6.210R	3
	3	Vacuum Tube and Analysis Lab.	6.211R	1
				17

SECOND YEAR

Term 4

2		Industrial Economics	1.506	2
3		Electrical Mathematics	6.115	3
2		Oscillator Circuits and Design	6.212R	2
	6	Oscillator Circuits and Design Lab.	6.213R	2
3		Automation Systems	6.244	3
2	3	Wave Generation and Shaping	6.234R	3
2		Semi-Conductors	6.234	2
				17

Term 5

3		Amplifier Circuits and Design	6.214R	3
	6	Amplifier Circuits and Design Lab.	6.215R	2
2	3	Industrial Electronics	6.218R	3
2	3	Industrial Television	6.228	3
3		Electronic Data Processing	6.240	3
3		American Institutions	1.600	3
				17

Term 6

2	3	Advanced Electronic Circuits	6.216	3
1	3	Servo Systems	6.236R	2
1	2	Industrial Television	6.235	1
3		Industrial Electronics	6.246	3
	3	Industrial Electronics Lab.	6.247	1
2	3	Microwaves	6.242	3
3		Psychology of Human Relations	1.608	3
				16

Electronic-Electrical Drafting Technology

The first year (initial three terms) of the following curricula are common: Electronic-Electrical Drafting and Electronic Technician. The student th has a choice of a major technology at the beginning of the fourth term o second year.

The objective of the Electronic-Electrical Drafting Program is to prepare individuals to meet the requirements for entrance into electronic and electrical drafting fields. The courses within the curriculum were especially planned and selected to qualify the technician for detailing and drawing of electronic and electrical plans and layouts. Practical elements of the engineering, designing, drafting, mathematics, physics, electrical-electronic theory and design analysis, serve to constitute a broad program, but at the same time depth is emphasized in special areas. The program of study is centered around occupational elements that normally cannot be obtained through experience alone, elements such as; principles of electronic-electrical design, electronic-electrical theory and other specialized areas.

The individuals trained in this field find employment in the broad electronic-electrical industry, performing such tasks as: transforming engineering ideas into drawings or layouts, calculating and determining equipment and component size, and preparing complete plans and detailed electrical drawings.

Upon satisfactory completion of the requirements in the Electronic-Electrical Program, an Associate of Applied Science Degree will be awarded, signifying that the student is prepared to effectively function and advance in the many job areas of the Electronic-Electrical Field.

Examples of opportunities are listed below:

Electronic-Electrical Production Draftsman
Electronic-Detail Draftsman
Electronic Research Draftsman
Electronic Statistical Draftsman
Production Layout Draftsman
Electro-Mechanical Draftsman

Associate in Applied Science Degree: Minimum 104 Term Units.

Electronic-Electrical Drafting Technology Curriculum

FIRST YEAR

Hours Class	Work Lab.	Course Title	Course No.	Term Units
erm 1				
3	2	Applied Physics	6.370	4
3		Communication Skills	1.100	3
	4	*Drafting*	4.101	2
	2	Engineering Problems	6.135	1
3		Technical Mathematics	6.261	3
3	2	Electrical Theory DC	6.200R	4
				17
Term 2				
3	2	Applied Physics	6.371	4
3		*Communication Skills*	1.102	3
	4	Electrical Drafting	4.103	2
	2	Engineering Problems	6.136	1
3		Technical Mathematics	6.262	3
3	2	Electrical Theory AC	6.202R	4
				17
Term 3				
3		*Technical Report Writing*	6.126	3
	4	Practical Descriptive Geometry	6.127	2
3		Technical Mathematics	6.266	3
3		Electrical Circuits	6.204R	3
	6	Electrical Circuits Lab.	6.205R	2
3		Vacuum Tube and Transistor Analysis	6.210R	3
	3	Vacuum Tube and Analysis Lab.	6.211R	1
				17

SECOND YEAR

Term 4				
3		Introduction to Psychology	1.606	3
3		Introduction to Specifications	4.102	3
3		Industrial Safety	4.108	3
2		*Industrial Economics*	1.506	2
2	6	Introduction to Fabrication Practices	4.100	4
3		Electronic-Electrical Standards	4.114	3
	6	Scales and Graphs	4.139	2
				20
Term 5				
3		American Institutions	1.600	3
3	2	Production Planning and Practices	4.104	4
2	3	Metals Application Treatment and Testing	4.106	3
1	6	Control Layout Systems	4.143	3
2		Cost Computations	4.140	2
	6	Cost Computations Lab.	4.141	2
2		Health Education	1.605	2
				19
Term 6				
3		Psychology of Human Relations	1.608	3
2		Employer-Employee Relations	4.500	2
	4	Technical Illustrations	4.127	2
1	8	Project Drafting	4.145	4
	6	Light Sheet Metal Drafting	4.147	2
	3	Pictorial Drafting	4.149	1
				14

General Drafting Program

The objectives of the General Drafting Curriculum is to prepare students for employment in drafting jobs that require a broad knowledge of the fundamental aspects of drafting and a minimum of specialization. The program is designed to give the student a supporting background in basic mathematics, physical sciences, and communication skills which, along with the drafting work, serve to prepare a proficient general draftsman.

Employment opportunities for general draftsmen are found in machine shops, mills, highway departments, public utilities, state tax agencies, county engineering offices, municipal engineering offices, architectural firms, contractors, engineering firms, and blueprint companies—working in jobs such as tracers, draftsmen detailers, assistant draftsmen, and in special areas as map makers.

After successful completion of the General Drafting Program the student may elect to enroll in the Technical Drafting Technology which will allow the individual to gain more depth and specialization in areas such as electrical, mechanical, structural drafting and technical illustration.

After satisfactory completion of the requirements of General Drafting Program, the student will be awarded a certificate and will be prepared to effectively function and advance in many drafting areas.

Examples of opportunities are listed below:

Machine Draftsman
Structural Draftsman
Architectural Draftsman
Welding Draftsman
Pipe & Flow System Draftsman
Engineering Graphics Draftsman

General Drafting Program Curriculum

Term 1

Hours Class	Work Lab.	Course Title	Course No.	Term Units
3		Mathematics	4.202	3
3		Communication Skills	1.100	3
2		Industrial Economics	1.506	2
2	6	Introduction to Fabrication Practices	4.100	4
	4	Drafting	4.101	2
3	2	Practical Physics	4.300	4
				18

Term 2

3		Communication Skills	1.102	3
	4	Drafting	4.105	2
1	9	Project Drafting	4.119	4
3		Mathematics	4.204	3
3	2	Practical Physics	4.302	4
				16

Term 3

3		Technical Report Writing	6.126	3
	4	Mechanical Drafting	4.109	2
3		Advanced Drafting Problems	4.115	3
	8	Project Drafting	4.121	3
3	2	Practical Physics	4.304	4
2		Employer-Employee Relations	4.500	2
				17

Highway Engineering Technician

The first year (initial three terms) of the following curricula are common: Civil and Structural Technician, Highway Technician, and Civil and Structural Drafting Technology. The student thus has a choice of a major technology at the beginning of the fourth term or second year.

This program is especially designed to train Highway Technicians for performing the tasks necessary in planning and constructing highways, railroads, bridges, viaducts, dams, and other structures. The courses of this program have been selected and planned to give the student a sufficiently broad base for entrance into the many phases of Highway Engineering work. The students gain a practical working knowledge of such subjects as surveying, soil mechanics, mapping and computing, inspection methods, highway organization and planning. Concurrently the student gains theoretical and mathematical knowledge and ability which complement the practical, thereby enabling him to enter and advance in the broad field of Highway Engineering.

Many individuals trained in this area become surveyors, design draftsmen or specialists in other well established technical jobs. Those working as surveyors determine the locations and measurements of land areas, buildings for construction, and other purposes; using the transit, level and other surveying instruments. Those employed in other technical jobs include estimators who prepare estimates of costs, materials, and terms necessary in the construction or repair of various highways and structures; highway inspectors who usually supervise the clearing rights of way and preparation of roads for surfacing

The training is sufficiently broad so that the student can use the program as a base for further study in general Civil Engineering and related work. Together with further study and sufficient experience, the graduate would have an opportunity to advance to a civil engineering rating while in the employ of certain federal, state, or city organizations.

Upon satisfactory completion of the requirements in the Civil and Structural Program, an Associate of Applied Science Degree will be awarded, signifying that the student is prepared to effectively function and advance in the many job areas of Civil and Structural Engineering.

Examples of opportunities are listed here:

Head Chainman
Levelman
Junior Construction Inspector
Map Draftsman
Computer
Traffic Technician
Topographer
Photogrammetric Aide
Supervising Technician
Estimator
Senior Construction Inspector
Senior Draftsman
Materials Technician
Surveyor
Instrumentman
Engineering Office Technician
Cartographer-Photogrammetrist
Job Superintendent
Claims Investigator

Associate in Applied Sicence Degree: Minimum 102 Term Units.

Highway Engineering Technician Curriculum

FIRST YEAR

Term 1

Hours Class	Work Lab.	Course Title	Course No.	Term Units
3	2	Applied Physics	6.370	4
3		Communication Skills	1.100	3
	4	Drafting	4.101	2
	2	Engineering Problems	6.135	1
1	6	Plane Surveying	6.101	3
3		Technical Mathematics	6.261	3
				16

Term 2

3	2	Applied Physics	6.371	4
3		Communication Skills	1.102	3
	4	Drafting	4.105	2
	2	Engineering Problems	6.136	1
1	6	Plane Surveying	6.103	3
3		Technical Mathematics	6.262	3
				16

Term 3

3		Technical Report Writing	6.126	3
2	3	Applied Mechanics	6.109	3
	4	Descriptive Geometry	6.127	2
2		Strength of Materials	6.107T	2
	3	Strength of Materials Lab.	6.107	1
3		Technical Mathematics	6.266	3
1	6	Surveying Computations	6.500	3
				17

SECOND YEAR

Term 4

2		Industrial Economics	1.506	2
	4	Mapping and Computing	6.131	2
2	3	Strength of Materials	6.128	3
1	3	Property Surveying	6.511	2
1	6	Topographical Surveying	6.517	3
3		Introduction to Psychology	1.606	3
				15

Term 5

3		Hydraulatics	6.112	3
	6	Mapping and Computing	6.133	2
2	3	Soil Mechanics	6.124	3
3		Practical Hydrology	6.535	3
1	6	Route Surveying	6.507	3
3		American Institutions	1.600	3
				17

Term 6

2	6	Route Surveying	6.509	4
3		Soil Mechanics	6.526	3
3		Traffic Engineering	6.553	3
3		Contracts and Specifications	6.118	3
2	2	Asphalt Paving	6.551	3
2		Concrete Practice	6.555	2
3		Psychology of Human Relations	1.608	3
				21

Machine Shop Technology

The purpose of this course is to give instruction on the standard machine shop tools and equipment found in the industrial shops in our area. Students are taught to operate drill presses, engine lathes, milling machines, grinders, shapers, welders, power saws, presses, and correct procedures for bench and layout work. The curriculum reflects the needs expessed in the machine field for persons efficient in the handling of both power and hand tools, along with a command of mathematics, blueprints, and layout work.

With the development of modern mass production methods and the trend toward more efficient machines, there is a need for well trained machinists and mechanics. Plants require skilled men for the operation of expensive machine tools. Beginners in the machinist field usually start work as apprentices or as machine tool operators. As they become more proficient they are assigned to more complex machinery and jobs which require more planning and initiative. Some mechanics continue their employment as machine tool operators, limiting their activities to one or two machines. Others are capable of using all types of machines in an expert manner and are capable of carrying a job through from the planning stage to completion. This involves laying out the job, setting up the machinery, tooling, and making the final assembly.

Upon satisfactory completion of the requirements in the Machine Shop Program, an Associate of Applied Science Degree will be awarded, signifying that the student is prepared to effectively function and advance in the many job areas of the machinists field.

Job opportunities for the graduate of this program are found in job shops, specialty shops, general machine shops, production shops, and maintenance departments of large manufacturing plants such as the paper industry, or others of similar nature.

Some of the job opportunities in the machinist field include:

Bench Hand
Machinist Helper
Welding Helper
Tracer
Machine Tool Operator
Machinist Apprentice
Layout Man
Tool Grinder
Maintenance Man
Heat Treater
Machinist
Inspector
Machinery Erector
Setup Man, Machine Tools
Foreman
Tool Maker
Leadman
Department Supervisor

Associate of Applied Science Degree: Minimum 101 Term Units.

Machine Shop Technology Curriculum

FIRST YEAR

Term 1

Hours Class	Work Lab.	Course Title	Course No.	Term Units
3		Communication Skills	1.100	3
3		Mathematics	4.202	3
3	2	Practical Physics	4.300	4
2	3	Bench & Layout Practices	4.821	3
2	3	Shaper Practices	4.825	3
2	3	Drill Press Practices	4.827	3
	2	Blue Print Reading & Sketching	4.853	1
				20

Term 2

3		Communication Skills	1.102	3
3		*Mathematics*	4.204	3
1	3	Welding	4.150	2
1	3	Bench & Pedestal Grinding Practices	4.829	2
2	4	Lathe Practices	4.831	3
2	4	*Milling Machine Practices*	4.835	3
	2	Blue Print Reading & Sketching	4.855	1
				17

Term 3

3		Machine Shop Problems	4.820	3
2	3	Heat Treatment of Steel	4.849	3
1	2	Advanced Drill Press & Shaper Practices	4.828	2
2	4	Advanced Lathe Practices	4.833	3
2	4	Advanced Milling Machine Practices	4.837	3
	2	Blue Print Reading & Sketching	4.857	1
2		Employer-Employee Relations	4.500	2
				17

SECOND YEAR

Term 4

2	3	Advanced Grinding Practices	4.839	3
	4	Drafting	4.101	2
3	6	Machine Shop Practices	4.841	5
1	3	Welding	4.151	2
3		Introduction to Psychology	1.606	3
				15

Term 5

3		American Institutions	1.600	3
	4	Machine Shop Project Drafting	4.823	2
3	6	Machine Repair and Reconditioning	4.851	5
3	6	Machine Shop Practices	4.843	5
2		Health Education	1.605	2
				17

Term 6

3		Psychology of Human Relations	1.608	3
2		Machine Shop Automation	4.824	2
2	4	Tool and Fixture Design and Application	4.847	3
3	12	Job Machining Practices	4.845	7
				15

Mechanical Technology

This curriculum of study is designed to provide depth of understanding in the technical requirements of occupations in modern mechanical design and production. This program provides the educational background necessary for many functions in such jobs as design draftsmen, tool designer, research assistant, or engineering assistant. The curriculum is designed to provide a broad technical competence needed for these jobs rather than the specific skills or techniques required for a single skill occupation. The instruction centers around occupational elements that normally cannot be obtained through experience alone; elements such as physical metallurgy, materials, and processes and principles of machine design. The program of study is designed and arranged to provide the student with an understanding of the materials and processes commonly used in the technology; and extensive knowledge of a field of specialization with an understanding of the engineering and scientific activities that distinguish the field; a facility with mathematics and proficiency in the application of physical science processes that are pertinent to the individual's field of technology.

Technicians trained in this technology may assist engineers in design and development work by making free hand sketches, rough layouts of machinery and other equipment, using engineering data and specifications. They help in determining whether a proposed design change is practical and how much it will cost to produce. They may be called upon to apply their knowledge of elementary mechanical engineering principles to solve particular design problems such as those involving tolerances, stresses, strain, friction, and vibration.

The graduate may enter the field of manufacturing, experimental shops, and development labs, performing such tasks as re-designing tools for efficiency, making cutting tools, jigs, and special fixtures.
Upon satisfactory completion of the requirements in Mechanical Design Program, an Associate in Applied Science Degree will be awarded, signifying that the student will be prepared to effectively function and advance in the many job areas of the technology.

Examples of opporunities are listed below:

Junior Mechanical Engineer
Production Technician
(Planning - Control)
Metallurgy Technician
Technical Writer
Method Analyst
Process Technician
Junior Engineer (Drafting)
Safety Technician
Tool, Jig, and Fixture Technician
Instrumentation Technician
Production Inspector
Time Study Technician

Associate in Applied Science Degree: Minimum 107 Term Units.

Mechanical Technology Curriculum

FIRST YEAR

Term 1

Hours Class	Work Lab.	Course Title	Course No.	Term Units
	2	Engineering Problems	6.135	1
3		Technical Mathematics	6.261	3
3		Communication Skills	1.100	3
3	2	Applied Physics	6.370	4
3	2	Metallurgy	STVS	4
	4	Drafting	4.101	2
				17

Term 2

3		Technical Mathematics	6.262	3
3		Communication Skills	1.102	3
3	2	Applied Physics	6.371	4
	4	Drafting	4.105	2
3	2	Metallurgy	STVS	4
2	3	Manufacturing Processes	STVS	3
				19

Term 3

3		Technical Mathematics	6.266	3
3		Technical Report Writing	6.126	3
3	2	Applied Physics	6.366	4
2	3	Strength of Materials	6.107T	3
	6	Mechanical Drafting	4.109	2
2	3	Manufacturing Processes	STVS	3
				18

SECOND YEAR

Term 4

3	3	*Mechanisms*	STVS	4
2	3	Strength of Materials	6.128	3
3		Introduction to Psychology	1.606	3
3	2	Machine Design	STVS	4
2		Industrial Economics	1.506	2
2	3	Manufacturing Processes	STVS	3
				19

Term 5

3	3	Mechanisms	STVS	4
2	2	Hydraulics	6.112	3
2	6	Design Problems	STVS	4
1	6	Basic Tool Design I	STVS	3
3		American Institutions	1.600	3
				17

Term 6

2	9	Design Problems	STVS	5
2	2	Hydraulics	6.114	3
1	6	Basic Tool Design II	STVS	3
3		Psychology of Human Relations	1.608	3
1	6	Drafting Elective	STVS	3
				17

Technical Drafting Technology

The objectives of the Technical Drafting Program is to prepare individuals for positions in engineering departments, in the areas of mechanical drafting design, or technical illustration and design. The courses within the program are specifically selected and planned to train technicians to qualify for jobs in the aircraft missile, research and development, and manufacturing areas doing such specific tasks as drawing preliminary sketches, making layouts from technical information, rendering drawings in pencil and ink, making overlays and paste ups and detailing and drawing of complete and final plans.

The curriculum is centered around occupational elements that normally cannot be obtained through experience alone, elements such as principles of design, materials and processes, mathematics, and physical science concepts as applied to the technical drafting area.

Upon the satisfactory completion of the requirements in the Technical Drafting Program, an Associate in Applied Science Degree will be awarded, signifying that the student will be prepared to effectively function and advance in the many job areas of the technical drafting field.

Examples of opportunities are listed below:

Technical Illustrator
Sheetmetal Layout Draftsman
Machine Drafting Technician
Structural Drafting Technician
Aeronautical Draftsman
Electronics and Electrical Drafting Technician
Topographical and Mapping Draftsman
Engineering Graphics Drafting Technician
Statistical Draftsman

Associate in Applied Science Degree: Minimum 112 Term Units.

Technical Drafting Technology Curriculum

FIRST YEAR

Term 1

Hours Class	Work Lab.	Course Title	Course No.	Term Units
3		Communication Skills	1.100	3
2		Industrial Economics	1.506	2
2	6	Introduction to Fabrication Practices	4.100	4
	4	Drafting	4.101	2
3		Mathematics	4.202	3
3	2	Practical Physics	4.300	4
				18

Term 2

3		Communication Skills	1.102	3
	4	Drafting	4.105	2
1	9	Project Drafting	4.119	4
3		Mathematics	4.204	3
3	2	Practical Physics	4.302	4
				16

Term 3

3		Technical Report Writing	6.126	3
	4	Mechanical Drafting	4.109	2
3		Advanced Drafting Problems	4.115	3
	8	Project Drafting	4.121	3
3	2	Practical Physics	4.304	4
2		Employer-Employee Relations	4.500	2
				17

SECOND YEAR

Term 4

3		Introduction to Psychology	1.606	3
	4	Electrical Drafting	4.103	2
	5	Advanced Machine Drafting	4.117	2
3		Introduction to Specifications	4.102	3
3		Industrial Safety	4.108	3
	2	Engineering Problems	6.135	1
3		Technical Mathematics	6.261	3
3	2	Applied Physics	6.370	4
				21

Term 5

3		American Institutions	1.600	3
2		Health Education	1.605	2
3	2	Production Planning and Practices	4.104	4
2	3	Metals Application Treatment and Testing	4.106	3
	5	Advanced Machine Drafting	4.123	2
	2	Engineering Problems	6.136	1
3		Technical Mathematics	6.262	3
3	2	Applied Physics	6.371	4
				22

Term 6

3		Psychology of Human Relations	1.608	3
	4	Architectural Drawing	4.107	2
	4	Structural Drafting	4.111	2
	5	Advanced Machine Drafting	4.125	2
	4	Technical Illustration	4.127	2
3		Technical Mathematics	6.266	3
3	2	Applied Physics	6.366	4
				18

Practical Nursing Curriculum

The need for Practical Nurses has increased a great deal over the past few years because of the expansion of the Public Health Program, extreme growth in Hospital Insurance, the increase in life expectancy, our growing population, higher income levels, insufficient professonal nurses to care for the sick and aged, rapid advances in the medical field, and our growing older age group.

The Practical Nurse is a person prepared by an approved educational program to share in the care of the sick, in the rehabilitation program and in the prevention of illness, under the supervision of a licensed physician and/or a registered nurse. She may provide nursing service in private homes, be employed in hospitals or health agencies, in public institutions or industrial establishments.

The program prepares selected people for a career in practical nursing, to perform the functions of a practical nurse and help fulfill the need of the health services in Oregon, and to prepare the student for the examination given by the State Board of Nurse examiners for Licensed Practical Nurses.

Applicants for the Practical Nurse course must be at least 17 years of age, be a graduate of an accredited high school or the equivalent as determined by test, be in good health as determined by an examination, and have suitable personal traits and character as to be accepted in such an important occupation. Persons interested in this course should check the front of catalogue for further information on the steps to become enrolled. Special requirements, if any, will be explained if requested.

The tuition for the course is $185.00 per year. This is payable as follows: $30.00 due when your enrollment is finally completed. The balance of the amount is paid at the rate of $15.00 per month. Tuition is due on or before the first class day in each month. Books for the course cost approximately $5.00, uniforms will cost about $25.00, other items needed during the year and for graduation will cost $15.00, making a total cost for the year of $230.

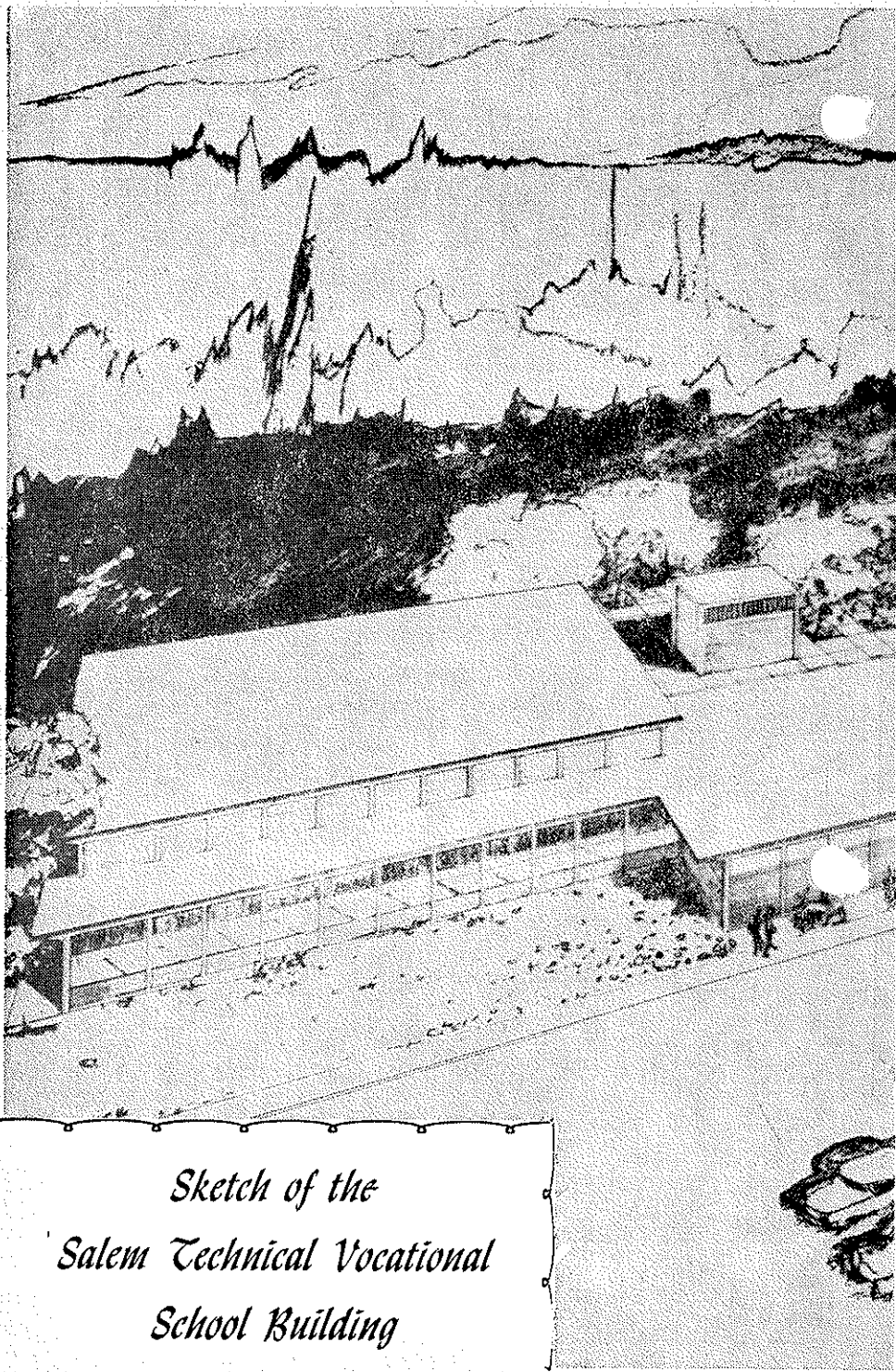
Students are paid a stipend of $.65 per hour for the time they are assigned to hospitals getting clinical experience making it possible for them to earn approximately $750.00 during the year.

Practical Nursing Curriculum

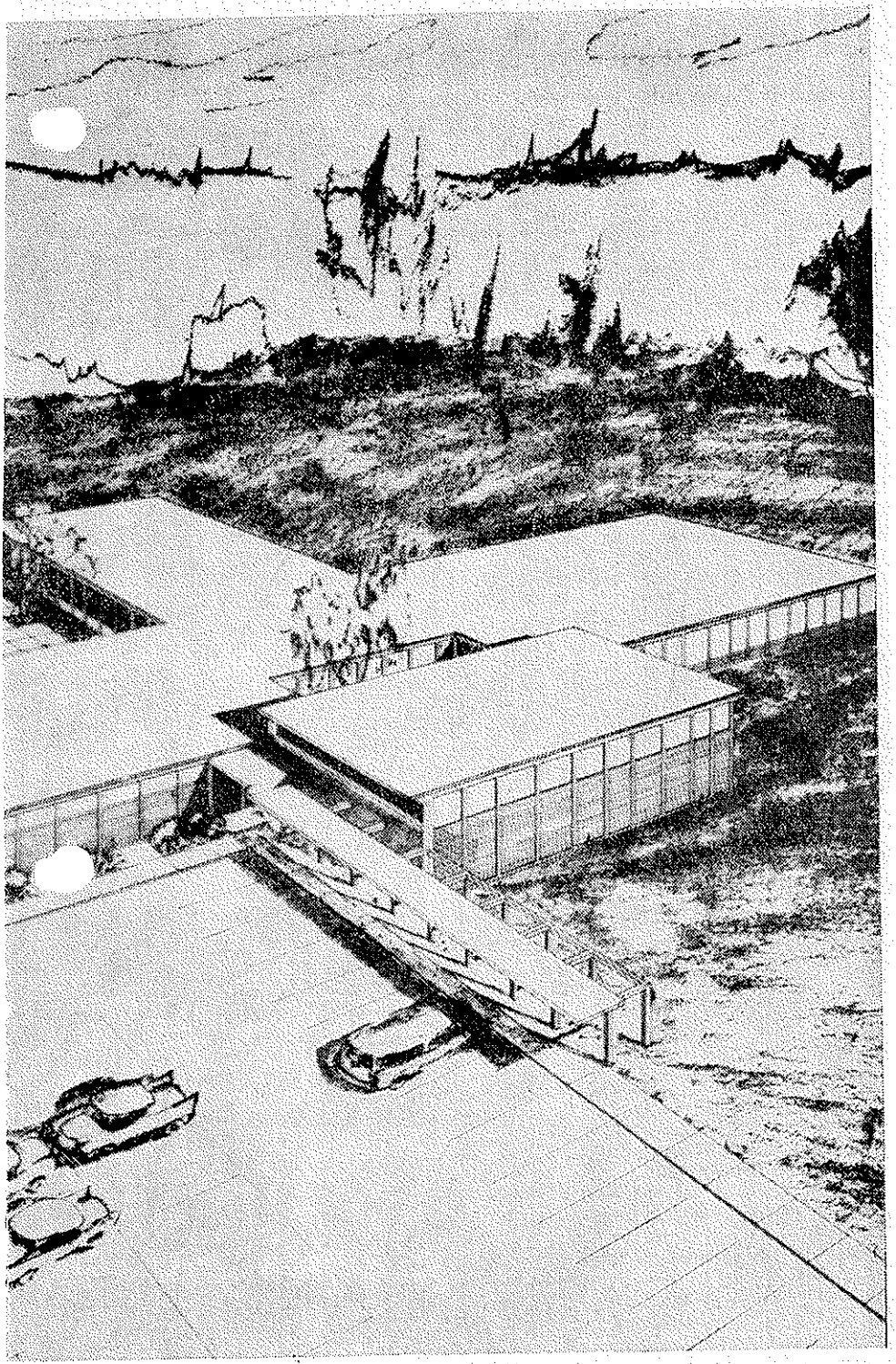
	Class	Clinical
PHASE I 4 weeks 20 days - 7½ hours per day - Beginning August 26, 1963		
1. Professional Adjustment ..... 20 hours		
2. Normal Nutrition ..... 20 hours		
3. Integrated Material ..... 40 hours		
a. 8 hours Anatomy & Phys.		
b. 24 hours Med. & Surg.		
c. 4 hours Pharmacology		
d. 4 hours Diet Therapy		
4. Fundamentals of Nursing ..... 70 hours		
Total Class	150	
PHASE II 12 weeks minimum - Beginning September 23, 1963		
1. Technical Classes ..... 43 hours		
5 hrs. per week in Com. Skills & Prof. Adjustment		
2. Integrated Material ..... 92 hours		
a. 30 hours Anatomy & Phys.		
b. 8 hours Pharmacology		
c. 16 hours Diet Therapy		
d. 38 hours Med. & Surg.		
3. Fundamentals of Nursing ..... 45 hours		
4. Obstetrics ..... 30 hours		
Total Class	210	
5. Clinical Experience		270
PHASE III 25 weeks - Beginning January 2, 1964		
1. Pediatrics ..... 30 hours		
2. Advanced Nursing Arts ..... 29 hours		
3. First Aid ..... 10 hours		
4. Disaster Nursing ..... 6 hours		
5. Professional Adjustment II ..... 12 hours		
Total Class	87	
6. Clinical Experience - Med. & Surg. Nursing		903
Totals	447	1173

Total Clock Hours for Program - 1580

End of School Year - June 20, 1964



Sketch of the
Salem Technical Vocational
School Building



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General Education Courses

Mathematics Courses

Major Technology Courses

Index to Course Descriptions

Index to Course Descriptions

Course Descriptions

General Education Courses

		LEC.	LAB.	TERM UNITS
AMERICAN INSTITUTIONS	**1.600**	**3**	**0**	**3**

A study of the effect of American social, economic, and political institutions upon the individual as a citizen and as a worker in business and industry. The inter-relationship of freedom and control is utilized as a common denominator in considering the fundamental principles and processes involved in the development of the basic institutions of our society. Topics considered are: culture, its functions and changes; social groups in relation to problems of urban living, personality formation, the family, and social classes; the American economic system, its concepts and organization; public opinion, the American political system, its constitutional foundations, judicial, executive, and legislative divisions; and international relations.

BUSINESS ECONOMICS	**1.524**	**3**	**0**	**3**

Business Economics 1.524 deals with the underlying principles by which business is influenced. Production, income, management, prices, values, markets, money, wastes, interest, and profits are examples of subjects studied with illustrations of how they affect current business situations. The course is designed to help the student understand the problems of business and thus have a deeper insight into his personal responsibilities to his firm.

COMMUNICATION SKILLS	**1.100**	**3**	**0**	**3**

This course is designed to improve the student's speaking and writing skills and to help him grow in language power through the development of correct habits of careful, forceful expressions. The course material covering the four basic skills—reading, speaking, writing, and listening—has been correlated so that the methods used in these four areas are complementary parts of the communication process. The practical phase of communication problems is kept in the foreground, and every effort is made to lead the student through industrial and business experiences that are thoroughly practical in nature. Problems in the field of oral communication include individual speech analysis, business and social conversation group speaking in business and industry, informative talks, demonstrations, explanations, etc. Cultivating the student's powers of analysis and evaluation of contemporary communication is an important objective in this course; therefore contemporary speeches, books, magazines, and newspaper are the source materials for oral and written assignments. Problems in outlining, note-taking, summarizing, report making, and in conventional usages in mechanics and grammar are considered.

COMMUNICATION SKILLS	**1.102**	**3**	**0**	**3**

This course presents the next steps in the process of improving the student's speaking, reading, writing, and listening skills. Problems in these areas are on a graduated basis and have been so selected as to help the student proceed in an orderly fashion to achieve greater competency of expression and a stronger sense of security in communicating his ideas and thoughts to others. Practice is provided for the student in developing reports; giving talks; taking part in conferences; reading, analyzing, and discussing

both general and technical periodicals; and handling representative forms of business writing. The general objective is to provide a graduated scale of activities which will help.

Prerequisite: Communication Skills 1.100 or equivalent.

EMPLOYER-EMPLOYEE RELATIONS 4.500 2 0 2

The objective of this course is to provide an understanding of the rights and responsibilities of employees. As a guide to making adequate decisions a study of population, economic and employment trends, and hours and working conditions is included. The development of and the role played by labor organizations, how labor representatives and management bargain, government laws and regulations covering collective bargaining, other state and federal labor laws, and how labor disputes are negotiated are given consideration. Information on government programs for old age and unemployment assistance and additional information on the problems faced by individuals applying for work and the individual's association with fellow workers and company representatives are covered.

HEALTH EDUCATION 1.605 2 0 2

This course is designed to provide individuals with select health and physical education activities through participation or study for the purpose of adding to their knowledge and appreciation of desirable mental and physical health practices as they relate to the individual and the community.

INDUSTRIAL ECONOMICS 1.506 2 0 2

Industrial Economics deals with the principles involved in the operation of the American economics system. The role of business and industry in the total economy is studied. Basic economic principles are applied to the relationship of employer and employee. Topics considered include historic trends, business organization, prices and competition, imperfect competition and monopoly, price levels, business cycles, taxation, labor unions management association, labor-management relations, labor legislation, and social and private security.

INTRODUCTION TO PSYCHOLOGY 1.606 3 0 3

This course is designed for the student who desires an introductory course in psychology. It explains the scope, methods, basic concepts, and facts of psychology. Some of the subjects covered are motivation, learning, thinking, perception, emotion, personality, mental health, animal behavior, and applied psychology.

PSYCHOLOGY AND HUMAN RELATIONS
1.546 3 0 3

Psychological principles and fundamentals of individual behavior involved in understanding the relationship of the individual and his reactions to the social framework with emphasis on business situations.

PSYCHOLOGY OF HUMAN RELATIONS
1.608 3 0 3

A study of principles of psychology that will be of assistance in the understanding of inter-personal relations on the job. Motivation, feelings, and emotions, and learning are considered with particular reference to their application to the on-the-job problems. Other topics investigated are: intelligence and aptitude tests, employee selection, supervision, job satisfaction, and industrial conflict as they relate to the employee and his work situation. Attention is also given to personal and group dynamics so that

the student may learn to apply the principles of mental hygiene to his adjustment problems as a worker and a member of the general community.

TECHNICAL REPORT WRITING **6.126** **3 0 3**

This is a course which supplies knowledge of the principles of composition and basic forms of writing reports. The subjects covered are: why reports are written, types of reports, make-up of reports, effectiveness of writing styles, gathering of facts for a report, planning a report, method of writing a report, layout and typing of a report, and visual aids in a report.

Prerequisite: Communication Skills 1.100

Mathematics Courses

ELECTRICAL MATHEMATICS **6.115** **3 0 3**

An applied course in mathematics for electronic engineering technicians. Includes an introduction to calculus covering graphical methods, differentiation, and integration with direct application to electronic and electrical circuitry.

Prerequsite: Technical Mathematics 6.266 or equivalent.

ENGINEERING PROBLEMS **6.135** **0 2 1**

This course of study in engineering problems is one in which the student is instructed in the development of accurate, effective, and efficient work and study habits. The course is intended to train the student to organize his analysis and record them in clear, concise form so that they can be interpreted.

Prerequisite: One year High School Algebra or Equivalent.

ENGINEERING PROBLEMS **6.136** **0 2 1**

This course aims to develop the skill of gathering together and sorting research results and problem solving records into logical summation. Mathematical and graphical analysis of data will be emphasized in the presentation of information in the report.

Prerequisite: Engineering Problems 6.135

MATHEMATICS **4.200** **3 0 3**

This is a course in practical mathematics including problems composed of whole numbers, fractions, measurements, formulas, graphs, and roots.

Prerequisite: Ability to profit from instruction.

MATHEMATICS **4.202** **3 0 3**

This is a course in practical mathematics for skilled workers, including the fundamentals of applied algebra and applied geometry, including symbols, equations, ratios and proportion, exponents, radicals, formulas, geometric lines and shapes, common geometric constructions, and introductory applied trigonometry.

Perequisite: Mathematics 4.200 or equivalent

		LEC.	LAB.	TERM UNITS
MATHEMATICS	**4.204**	**3**	**0**	**3**

This course concentrates on actual problems encountered by machinists, precision inspectors, tool-and-dyemakers, draftsmen, tool designers, and other workers in related industrial occupations. It applies arithmetic, algebra, geometry, trigonometry, and their various phases to jobs encounteed in every day industry. The emphasis is on the actual problem solving aspects growing out of various jobs. It is a continuous and more thorough coverage of many areas studied in the prerequisite Math. 4.202.

MATHEMATICS FOR AUTOMATIC DATA PROCESSING

6.916	**5**	**0**	**5**

Basic logic, numbering systems, algebra with emphasis on problem solving, computation with logarithms and with numbers in bases other than ten, and Boolean Algebra. This is a prescribed course for the Automatic Data Processing Curriculum.

Prerequisite: Mathematics 4.204 or its equivalent.

PRACTICAL DESCRIPTIVE GEOMETRY

6.127	**0**	**4**	**2**

This course gives a brief review of advanced drafting problems and takes the student further into the field of descriptive geometry principles. In the introduction of detailed drawing from assembly drawing the principles of Descriptive Geometry are necessary to the draftsman.

Prerequisite: Third Term standing or approval of dept. head.

TECHNICAL MATHEMATICS	**6.261**	**3**	**0**	**3**

This is an applied course in mathematics on the technican level, covering the slide rule, tables and interpolation, additional applications in geometry, a review of algebriac operations, systems of linear equations, function and graphs, advanced applications of exponents and radicals and quadratic equations in one unknown and introductory trigonometry.

Prerequisite: High School Algebra or equivalent.

TECHNICAL MATHEMATICS	**6.262**	**3**	**0**	**3**

This is an applied course in mathematics on the technician level including logarithms, right and oblique triangle problem solving, trigonometric applications, and graphs of trigonometric formulas, dentities and equations, and graphs of trigonometric functions.

Prerequisites: Technical Mathematics 6.216 or equivalent.

TECHNICAL MATHEMATICS	**6.266**	**3**	**0**	**3**

This is an applied course in mathematics on the technician level covering simultaneous quadratic equations, ratio and proportion, binomial theorem, arithmetic and geometric progressions, exponential functions, complex notation and vector algebra.

Prerequisite: Technical Mathematics 6.262 or equivalent

Science Courses

		LEC.	LAB.	TERM UNITS
APPLIED PHYSICS	**6.370**	**3**	**2**	**4**

A course in applied physics on the post high school level. Covers mechanics of measurement, structure of matter. heat, energy, heat engines, and sound and light. Laboratory time is provided for demonstrations and experiments to clarify principles and procedures covered in class.
Prerequisites: Tech Math 6.261 or equivalent or approval of dept. head.

APPLIED PHYSICS	**6.371**	**3**	**2**	**4**

A course in applied physics on the post high school level. Covers the principles of vectors, kinematics, work-power-energy, machines, and angular velocity. Laboratory time is provided for demonstration and experiments to clarify principles and procedures covered in class.
Prerequisites: Applied physics 6.370 or approval of dept. head.

APPLIED PHYSICS	**6.366**	**3**	**2**	**4**

A course in applied physics covering magnetism and electricity on the post high school level. Basic electronic currents, sources and effects of electric current, alternating current, generators, motors, distribution of electric power, and introduction to electronics and atomic energy in industry are covered. Laboratory time is provided for demonstrations and experiments to help clarify the principles and procedures covered in class.
Prerequisites: Applied Physics 6.371

MODERN PHYSICS	**STVS**	**3**	**2**	**4**

This course is designed to provide a working knowledge of the common theories and nomenclatures of the molecular, atomic, and nuclear sciences. Common physical phenomena relating to the molecular, crystalline, atomic states are studied. Radiation detection and measurement comprise the major areas of study in order that the student gain knowledge in the operation of equipment commonly used in the detection of nuclear radiation.
Prerequisite: Applied Physics 6.370 and 6.371

PRACTICAL PHYSICS	**4.300**	**3**	**2**	**4**

This course in practical physics is designed for skilled workers, covering matter, measurements, mechanics, and machines. Laboratory time is provided for demonstrations and experiments to help clarify the principles and procedures covered in class.

PRACTICAL PHYSICS	**4.302**	**3**	**2**	**4**

This course in practical physics is designed for skilled workers, covering heat, light, and sound. Laboratory time is provided for demonstrations and experiments to help clarify the principles and procedures covered in class.
Prerequisite: Mathematics 4.200 or equivalent

		LEC.	LAB.	TERM UNITS
PRACTICAL PHYSICS	**4.304**	**3**	**2**	**4**

This course in practical physics is designed for skilled workers, covering magnetism and electricity. Laboratory time is provided for demonstrations and experiments to help clarify the principles and procedures covered in class.

Prerequisites: Practical Physics 4.302

PRACTICAL PHYSICS	**6.919**	**3**	**2**	**4**

This course is designed to offer a broad introduction on the study of magnetism, electricity, and electronics. Laboratory time is provided for demonstrations and experiments to help clarify the principles and procedures covered in class.

Prerequisite: Mathematics 4.202 or approval of dept. head.

Major Technology Courses

ACCOUNTING	**6.920**	**3**	**3**	**4**

An introduction to the basic procedures of accounting and the preparation of financial statements. The methods of recording business transactions, the books commonly used, and the techniques of closing the books periodically.

ACCOUNTING	**6.921**	**3**	**3**	**4**

Accounting problems arising in different types of business, such as the corporation, partnerships, and individual proprietorship, together with their financing. Introduction to analysis and interpretation of financial statements.

Prerequisite: Accounting 6.920

ACCOUNTING	**6.922**	**3**	**3**	**4**

Methods of accounting for the corporate organization including capital stock, earnings, bonds, and intangibles. An introduction to accounting for manufacturing operations.

Prerequisites: Accounting 6.921

ADVANCED DRAFTING PROBLEMS	**4.115**	**3**	**0**	**3**

Introduction to practical descriptive geometry used by the draftsman. Theory of auxiliary views, true length, shape, angle, and point of intersection, developed from point-line-plane through the use of revolution. Introduction to graphical solution of simple vector problems. Emphasis on application of principles to problems commonly encountered by draftsmen.

Prerequisites: Drafting 4.105 and Math 4.204

TERM
LEC. LAB. UNITS

ADVANCED DRILL PRESS AND SHAPER PRACTICES 4.828 1 2 2

This is an advanced course in machine shop practices. Angular shaping; contour shaping; tongue and groove cuts; slotting work; and dovetails are the shaper areas covered. Drill press practices include: reamers and reaming; counter-boring and counter sinking; boring on the drill press; and power tapping. Laboratory time is provided for individual students to perform the various operations.

ADVANCED ELECTRONIC CIRCUITS 6.216R 2 3 3

A course designed to simulate problems in industry. Covers six electronic areas including computers, communications, industrial controls, electronics, microwaves, and radar. Class meetings involve overview of each area and study of current problems and opportunities. Lab involves construction, testing, and reporting performance of assigned circuits.

ADVANCED GRINDING PRACTICES 4.839 2 3 3

This is an advanced course covering precision grinding methods. Studies include: work and wheel speeds; wheel wear analysis; roughing and finishing cuts; arc and area of wheel contact; cylindrical grinding; internal grinding; surface grinding; and phase grinding.

ADVANCED LATHE PRACTICES 4.833 2 4 3

A continuation of the lathe series of classes. Studies include: internal boring; threading, and taper turning; external threading taper turning and angular turning; and machine reaming. Laboratory time is provided for student operation of equipment.

ADVANCED MACHINE DRAFTING 4.117 0 5 2

This course extends background in the area of machine drafting. It will include technical sketching and shape description, multi-view projections, sectional views, and revolutions.

ADVANCED MACHINE DRAFTING 4.123 0 5 2

This course presents advanced studies in the major areas of machine drafting. The areas covered will include threads and fasteners, assembly drawings, pictorial drawings, and engineering graphics.

Prerequisite: Advanced Machine Drafting 4.117

ADVANCED MACHINE DRAFTING 4.125 0 5 2

This course presents practical drafting problems requiring the application of previously learned principles of machine drafting. This will include advanced work on cams, gears, and the relationships of drafting to shop processes.

Prerequisite: Advanced Machine Drafting 4.123

		LEC.	LAB.	TERM UNITS
ADVANCED MILLING MACHINE PRACTICES	**4.837**	**2**	**4**	**3**

A continuation of the milling machine series. Studies include: straddle milling; rotary talle work; dividing head constructon and indexing; gear cutting and gear terminology; and boring work on milling machines. Laboratory time is provided for student operation of milling machines.

AMPLIFIER CIRCUITS & DESIGN	**6.214R**	**3**	**0**	**3**

A continuation of oscillator circuits and design. Covers the application of vacuum tubes and transistors in amplifier circuits. Analyzes the vacuum tube amplifier into its basic and equivalent circuit. Includes load-lines, distortion, and pentode and beam-power tube considerations. Analyzes transistor amplifiers in various circuit configurations and covers biasing methods. Also includes transformer analysis, transformer-coupled amplifiers, and R-C coupled amplifiers. Special amplifiers using vacuum tubes and transistors are studied. Includes push-pull circuit analysis and phase inversion; Class C amplifier analysis, and high frequency amplifiers.

AMPLIFIER CIRCUITS & DESIGN LAB.	**6.215R**	**0**	**6**	**2**

The application of theory studied in Amplifier Circuits and Design. Involves the design, construction, and testing of various types of vacuum tube and transistor amplifiers employing direct, transformer, and R-C coupling. Several push-pull circuits utilizing different types of phase inverters are built and tested and the principle of complementary symmetry is demonstrated in the operation of transistors in push-pull. Class C power amplifiers are consructed and adjusted for proper operation and different types of high-frequency amplifiers are also built and tested.

APPLIED MECHANICS	**6.109**	**2**	**3**	**3**

This course deals with forces and the effect of forces acting upon rigid bodies at rest. This includes resolution of forces, equilibrium and resultants of force systems, friction and centroids. Laboratory time is provided for the conducting of experiments to clarify the principles and procedures covered in class.

Prerequisites: Third Term standing or approval of dept. head.

APPLIED MECHANICS	**6.111**	**2**	**3**	**3**

This course deals with the motion of rigid bodies and with the forces that produce or change their motion. The principles of rectilinear motion, curvilinear motion, rotation, and plane motion are covered in the course. Laboratory time is provided for the conducting of experiments to clarify the principles and procedures covered in class.

Prerequisite: Fourth Term standing or approval of dept. head.

ARCHITECTURAL DRAWING	**4.107**	**0**	**4**	**2**

An advanced course emphasizing architectural drawing techniques. The course will cover methods and procedures in architectural drawings, lettering, layout and design of the standard drawings (construction and display), and rendering the display drawing. Carpentry and masonry principles and construction drawings are included. Design principles such as standard stock sizes, strength of joints, maximum loads and spans, and material weights will be discussed. Application consists of drawing complete sets of working drawings of residential and commercial buildings.

		LEC.	LAB.	TERM UNITS
ASPHALT PAVING	**6.551**	**2**	**2**	**3**

A study of asphalt paving including types of asphalt pavements, petroleum asphalts, aggregates, design of hot mix asphaltic concrete, plant construction, liquid asphalt mixes, seal coats, surface treatment, reconstruction of old pavements, design of flexible pavements, and testing procedures. Laboratory work will consist of field trips, testing of mixes, surfaces and aggregates, design of mixes, and application of a patch.
Prerequisites: Sixth Term standing or approval of dept. head.

AUTOMATED SYSTEMS & PROCEDURES	**6.904**	**3**	**0**	**3**

Fundamentals of automated data systems and procedures. Techniques and principles of systems analysis, forms design and control, systems economics, feasibility studies, and the installation of electronic data processing systems.

AUTOMATION SYSTEMS	**6.244**	**3**	**0**	**3**

This course is devoted to the study of the techniques of automation. Introduces the basic concepts of automation and covers automatic controls, pneumatic control devices, hydraulic conrol devices, and electronic and electric control devices. The application of automation is studied from examples in the areas of materials handling and assembling, production of metals, metal casting processes, mechanical working of metals, press working of metals, metal cutting operations, heat treating of metals, metal joining operations, and inspection and quality control.

BASIC TOOL DESIGN I	**STVS**	**1**	**6**	**3**

Lectures, classroom discussion, and actual drawing board work are combined to help the student gain knowledge and experience necessary to design tools commonly used in modern manufacturing. The work consists of designing and laying out cutting tools, gauges, simple jigs, fixtures, and dies. Mass production methods are discussed so that the student may apply the information gained in the practical work of tool designing.

BASIC TOOL DESIGN II	**STVS**	**1**	**6**	**3**

This course is a continuation of Basic Tool Design I. Lectures, classroom discussion, and actual drawing board work are combined to help the student gain knowledge and experience necessary to design tools commonly used in modern manufacturing. The work consists of designing and laying out cutting tools, gauges, simple jigs, fixtures, and dies. Mass production methods are discussed so that the student may apply the information gained in the practical work of tool designing.
Prerequisite; Basic Tool Design I

BENCH & LAYOUT PRACTICES	**4.821**	**2**	**3**	**3**

This is a course on bench tools and their use, with layout principles and applications. The bench tools studied will include hand tools such as: hammers; screwdrivers; files; chisels; wrenches; hand taps and reamers; hacksaws and threading dies. Layout work will consist of the use of tools, measurements, coating materials, and applications of bench and surface plate layout.

		LEC.	LAB.	TERM UNITS
BENCH & PEDESTAL GRINDING PRACTICES	**4.829**	**1**	**3**	**2**

This course considers the bench and pedestal grinder. Wheel construction, selection, mounting, and dressing methods are studied. The grinding of single and multiple point tools is undertaken. Care and maintenance of grinders and safety precautions receive attention. Laboratory time is utilized for grinding practice demonstrations and individual student operation of grinders.

Prerequisites: Bench and Layout Practices 4.821

BLUEPRINT READING & SKETCHING 4.853 **0 2 1**

This is the first in a series of blueprint reading courses. Common machine shop terms, abbreviations, decimal equivalents, tap drill sizes, dimensions, notes, three view drawings, line alphabet, notes and symbols are discussed.

Prerequisites: Curriculum entrance requirements.

BLUEPRINT READING & SKETCHING 4.855 **0 2 1**

A continuation of the blueprint reading series. Areas discussed are: scaling and scaling dimensions, holes; fillets; radii; title block; bill of materials; alterations and revisions; section and auxiliary views.

Prerequisites: Blueprint Reading and Sketching 4.853

BLUEPRINT READING & SKETCHING 4.857 **0 2 1**

A continuation of the Blueprint Reading Sequence. This course covers a study of gears, gear terminology, and gearing principles. Industrial blueprints are given attention, with the emphasis on reading and accurate interpretation of complex drawings.

Prerequisite: Blueprint Reading and Sketching 4.855

BUSINESS MANAGEMENT **6.908** **3 3 4**

The over-all picture of how industry is organized and how it functions, including the history of American industry, organization of the industrial enterprise, industrial risk and forecasting, financing the enterprise, building the internal organization, developing the product, constructing the physical facilities, planning and controlling the manufacture of the product, principles of industrial relations, and managing the office.

Prerequisite: Introduction to Business and Public Administration 2.502

BUSINESS STATISTICS **6.912** **3 3 4**

A practical course in the use and interpretation of statistics, incorporating elementary statistical concepts, frequency distribution analysis, index numbers, use of tables, charts, and graphs; sampling error theory; statistical distributions and their measurement; time series analysis; trends and seasonal business cycles.

Prerequisites: Introduction to Business and Public Administration; Math 4.204 and Accounting 6.920

		LEC.	LAB.	TERM UNITS
CONCRETE CONSTRUCTION & DESIGN	**6.123**	**2**	**5**	**4**

A study of concrete materials, shear and bending calculations, shear and bending stresses and design calculations. Coverage is given to rectangular, tee, and reinforced beams; reinforced floor systems and columns, foundations, retaining walls and miscellaneous members. Laboratory work will consist of problem solving.

Prerequisites: Sixth Term standing or approval of dept. head.

CONCRETE PRACTICES	**6.555**	**2**	**0**	**2**

A study of the producing, placing, finishing, and curing of concrete; the composition of various grades of concrete and their application to construction projects, forms, inspection, properties of concrete, and related factors.

Prerequisites: Sixth Term standing or approval of dept. head.

CONSTRUCTION CODES	**6.122**	**2**	**0**	**2**

This course is designed to familiarize the student with the various codes which specify the standards of construction and the installation of electrical and plumbing fixtures. Students study the Pacific Coast Uniform Building Code, The National Electrical Code and the Oregon State Plumbing Laws, and the Regulations governing Plumbing and Water supply. The function of Government units (state and local) charged with the administration and inspection of building construction will be covered.

Prerequisites: Approval of dept. head.

CONSTRUCTION COSTS COMPUTATION	**4.134**	**2**	**0**	**2**

Introduction to the basic principles of estimating the amount and cost of materials required and the attendant labor cost involved in various types of construction projects.

Prerequisites: Fifth Term standing or approval of dept. head.

CONSTRUCTION COSTS COMPUTATION LAB.	**4.135**	**0**	**5**	**2**

The student applies the principles of estimation to drawing assignments. Examples of local job estimates, and observation of the job site will be used to illustrate the principles whenever practicable.

Prerequisites: Fifth Term standing or approval of dept. head.

CONSTRUCTION ESTIMATING	**6.110**	**2**	**0**	**2**

Designed to develop skills in estimating the amount and cost of materials required, and labor cost involved in various types of construction. An opportunity is provided for the application of these skills by requiring the student to make estimates of material and labor quantities and costs for representative type of construction.

Prerequisites: Fifth Term standing or approval of dept. head.

		LEC.	LAB.	TERM UNITS
CONSTRUCTION STANDARDS	**4.110**	**2**	**0**	**2**

A study of the required practices covered in local, state, and federal construction standards.

Prerequisites: Fourth Term standing or approval of dept. head.

CONTRACTS & SPECIFICATIONS	**6.118**	**3**	**0**	**3**

This is a course designed to acquaint the student with common usage and practice in the preparation of contracts and attendant specifications. Examination of existing contracts covering current jobs will be used whenever possible with practical problems designed to teach the application of theory learned.

Prerequisites: Second Year Standing or approval of dept. head.

CONTROL LAYOUT SYSTEMS	**4.143**	**1**	**6**	**3**

Introduction of time and methods study for increased production, efficiency, and safety. Methods of equipment layout and production routing, and personnel and lighting requirements will be discussed. Laboratory time will be used in applying these principles to layout drawings.

Prerequisites: Fifth Term standing or approval of dept. head.

COST ACCOUNTING	**2.576**	**3**	**0**	**3**

Introduction to the analysis and control of material, labor, and overhead costs in manufacturing, with emphasis on process and job-order costs systems.

Prerequisite: Accounting 6.921

COST COMPUTATIONS	**4.140**	**2**	**0**	**2**

An introduction to the principles of time and cost computations for electronic-electrical device fabrication and installation.

Prerequisites: Fifth Term standing or approval of dept. head.

COST COMPUTATIONS LAB.	**4.141**	**0**	**6**	**2**

The student will apply the principles of estimating to find the cost and time allowances for simulated problems.

Prerequisites: Fifth Term standing or approval of dept. head.

DESIGN PROBLEMS I	**STVS**	**2**	**6**	**4**

Opportunities in advanced drafting room practice are offered in this course. The student applies his knowledge of mathematics, science, and drawing to practical problems while he is designing complete machines or component parts machines. He analyzes the problem, gathers data, sketches ideas on paper, does all necessary mathematical calculations, makes working drawings, and finally checks his work. Throughout the course he is encouraged to use his judgement and work on his initiative.

		LEC.	LAB.	TERM UNITS
DESIGN PROBLEMS II	**STVS**	**2**	**9**	**5**

This is a continuation of Design Problems I

Opportunities in advanced drafting room practice are offered in this course. The student applies his knowledge of mathematics, science, and drawing to practical problems while he is designing complete machines or component parts machines. He analyzes the problem, gathers data, sketches ideas on paper, does all necessary mathematical calculations, makes working drawings, and finally checks his work. Throughout the course he is encouraged to use his own judgement and work on his own initiative.

Prerequisite: Design Problems I

DRAFTING	**4.101**	**0**	**4**	**2**

This is a fundamental course in drafting designed to give the student a basic understanding of drawing techniques. Emphasis will be placed on the application of drafting instruments, standard orthographic projection, layout procedures, and ASA approved lettering techniques. Drawing techniques such as geometric construction, selection of views, sectional and auxiliary views, revolutions, heads, and standard dimensioning practices will be covered.

DRAFTING	**4.105**	**0**	**4**	**2**

This is an intermediate course designed to prepare students to enter mechanical, structural, civil, and architectural drafting. It includes isometric projection, perspective drawings. Emphasis is placed on the concept, technique of inking, and the development of working drawings as used in industry. Limitations of general shop equipment are discussed.

DRILL PRESS PRACTICES	**4.827**	**2**	**3**	**3**

This course is an introduction to the construction, care, function and operation of drill presses. Studies of the sensitive, radial, and gang drill presses will be made. Speeds and feed for drilling will be discussed and applied. Different types of drill bits, methods of mounting the work, and drilling procedures will receive attention. Operations will be performed on the drill press during scheduled laboratory periods.

Prerequisite: Curriculum entrance requirements.

EARTHWORK COMPUTATIONS & ESTIMATES	**6.528**	**1**	**3**	**2**

Problems in computing cuts and fills in highway work, mass diagrams, borrow pits, are worked out in detail. Estimating is limited to computations of quantities and costs on highway, bridge and heavy consruction work.

Prerequisites: Fourth Term Standing or approval of dept. head.

ELECTRIC ACCOUNTING MACHINE APPLICATIONS	**6.917**	**3**	**2**	**4**

Theory and practice in the application of electric accounting machines to the solution of business problems. Examples of currently operating punch card systems in basic industries.

ELECTRIC ACCOUNTING MACHINE OPERATIONS	**6.915**	**2**	**6**	**4**

Intensive study and practice on punch card equipment studied in Introduction to Electronic Accounting Machines 6.913. Functional wiring principles of basic punch card data processing machines.

		LEC.	LAB.	TERM UNITS
ELECTRICAL CIRCUITS	**6.204R**	**3**	**0**	**3**

A continuation of electrical theory with an emphasis on the analysis of the characteristics of complex waveform circuits. Covers passive filter networks, bi-directional wave forms, complex waveform analysis of simple circuits, waveform analysis of series R-C circuits, waveform analysis of series R-L circuits and waveform analysis of combined networks.

ELECTRICAL CIRCUITS LAB.	**6.205R**	**0**	**6**	**2**

Practical application of the theory studied in Electrical Circuits 6.204R. Involves the construction and testing of passive filter networks including the constant k, the series m-derived, and the shunt m-derived types. Response of simple circuits involving diodes, resistance, inductance, and capacitance to square-wave, triangular-wave, saw-tooth-wave, and rectangular-wave pulses is analyzed. Various R-L-C combinations are designed and tested for low and high-frequency response, rise and fall times are measured, and integrator and differentiator circuits are constructed and analyzed.

ELECTRICAL DRAFTING	**4.103**	**0**	**4**	**2**

A course covering the techniques and inventions used in the electronic-electrical industry. It includes symbols, wiring diagrams, introduction to pictoral drawings, chassis layout schematic diagrams, power distribution diagrams and charts, graphs, and ASA and EEIA approved symbols.
Prerequisite: Drafting 4.101 or approval of dept. head.

ELECTRICAL THEORY DC	**6.200R**	**3**	**2**	**4**

Presents an introduction to electronics on the basis of direct currents with an emphasis on contemporary techniques as a supplement to basic concepts. Covers the principles of electron physics, unidirectional current, and factors affecting its magnitude, series-circuit analysis, parallel-circuit analysis, complex unidirectional-current circuits the phenomena of magnetism and electromagnetism, inductance and its characteristics, characteristics of capacitance, and electrical measurement instruments.

ELECTRICAL THEORY AC	**6.202R**	**3**	**2**	**4**

A continuation of electrical theory on the basis of alternating currents with an emphasis on contemporary techniques as a supplement to basic concept. Covers the analysis of the sine wave series circuits with a sinewave input, series resonance, parallel circuits with a sine wave input, parallel resonance, the non-resonant and the resonant transformer and attenuators and pads.
Prerequisite: Electrical Theory DC 6.200R

ELECTRONIC DATA PROCESSING	**6.240**	**3**	**0**	**4**

An introduction to the principles of electronic digital computers. Covers the application and programming of computers in business, industrial, and scientific organizations. Reviews the decimal and binary numbering systems as they relate to computers; analyzes computer circuitry with emphasis on transistor and diode switching circuits; presents the fundamentals of logical design with an introducton to Boolean Algebra and the use of block diagrams; analyzes the major divisions of a digital computor in terms of the arithmetic element, the memory element, input and output devices, and the conrol element.

ELECTRONIC DATA PROCESSING MACHINE APPLICATIONS

		LEC.	LAB.	TERM UNITS
	6.911	3	2	4

The applications of electronic computers to the solution of data processing problems in such areas as inventory control, sales analysis, payroll, production scheduling, etc., in basic industries. The function of Electronic Data Processing machines in banking, insurance, utilities, government, and manufacturing.

Prerequisites: Introduction to Programming; Automated Systems and Procedures.

ELECTRONIC-ELECTRICAL STANDARDS

	4.114	3	0	3

A study of the industrial standards published by the ASA, AIEE, and the NEMA. Also includes a survey of typical state, federal, and military electronic-electrical practices as they affect the draftsman.

Prerequisite: Fourth term standing or approval of dept. head.

FOUNDATIONS OF STRUCTURES 6.120 3 0 3

A study of various materials, devices, and designs used in structural foundations such as footings, cofferdams, caissons, abutments, piers, and underpinnings.

Prerequisites: Applied Mech. 6.111 and Tech Math 6.266

HEAT TREATMENT OF STEEL 4.849 2 3 3

A study of methods and procedures for improving the characteristics of steel by hardening and tempering. Process of heat treating include: Furnace and flame hardening; case hardening; tempering, annealing, and normalizing; and hardness and tensile testing. Laboratory time is provided for hardening, tempering and testing demonstrations and experiments.

Prerequisites: Practical Physics 4.300

HYDRAULICS 6.112 3 0 3

The first course in the study of hydraulics covers the fundamental properties of fluids, principles of hydrostatic pressure—including Pascal's Law, the hydro-static paradox, the Archimede's principle—measurement by manometer, the measurement of fluid properties. The relationship of hydrostatic pressure and center of gravity and the effect of hydrostatic pressure exerted against plane surfaces will also be discussed. Time is provided for demonstrations and experiments to help clarify the principles and procedures covered in class.

Prerequisite: 5th Term Standing or approval of dept. head.

HYDRAULICS 6.114 3 0 3

Consists of the fundamentals of fluid flow, Bernoullis theorem, flow profiles, stream restrictions (such as weirs, flumes, metering runs), distribution of energy in the stream, flow through pipe, Reynolds Law, Newton's Laws of hydrodynamics, vector representation, hydraulic similitude, and dimensional analysis. Time is provided for demonstration and experiments to help clarify the principles and procedures covered in class.

Prerequisite: Hydraulics 6.112 or equivalent.

		LEC.	LAB.	TERM UNITS
INDUSTRIAL CONSTRUCTION DRAFTING 4.133		**2**	**6**	**4**

Introduction to the steps of construction for commercial and industrial building. Discussion of modern construction techniques; materials; drawing requirements; inter-relationship of architectural, civil, mechanical, and electrical professions in industral construction; labor trends as they affect building design; and elements of industrial electrical drawing. Laboratory time is used to develop typical drawings requiring application of principles discussed.

Prerequsite: Fifth term standing or approval of dept. head.

INDUSTRIAL CONSTRUCTION DRAFTING 4.137		**2**	**6**	**4**

Continuation of the industrial construction processes with emphasis on bridge and tower construction, plant layout, field drawings, revisions, and piping drawings. Laboraory time is used to develop typical drawings requiring application of principles discussed.

Prerequisite: Fifth term standing or approval of department head.

INDUSTRIAL ELECTRONICS	**6.218R**	**2**	**3**	**3**

An introductory class and laboratory course covering the principles and applications of electronics in industry. Involves a review of the principles of D-C motors and generators, and covers D-C motor controls with emphasis on electronic controls. Also covers relays and time-delay circuits; industrial photo-electric control and typical applications; electronic power-control with saturable core reactors and the amplidyne; and electronic control of welding.

Prerequisite: Amplifier Circuit and Design Lab.

INDUSTRIAL ELECTRONICS	**6.246**	**3**	**0**	**3**

A continuation of industrial electronics with emphasis on A-C principles and applications in industry. Covers alternating current characteristics, generation of A-C, vector diagram analysis, properties of electric circuits, and graphical representation of resistance, reactance, and impedance. Single phase circuits are analyzed in terms of power factor, and three phase wye and delta combinations are studied. Also includes transformers and regulators, alternating-current generators, polyphase induction motor, synchronous motors and self-synchronous devices, single phase motors, circuit-protective and switching equipment, electrical instruments and electrical measurement.

Prerequisite: Industrial Electronics 6.218R

INDUSTRIAL ELECTRONICS LAB.	**6.247**	**0**	**3**	**1**

The practical application of the theory studied in Industrial Electronics 6.246. Alternating Current theory and principles are verified by the construction and testing of circuits involving series resistance, inductance, and capacitance. Phase-angle, reactance, and impedance are calculated and checked, and vector diagrams are drawn to show current and voltage relationships. Three-phase transformers are wired in various delta-wye combinations and output voltages are calculated and verified. Small transformers are designed to deliver specified outputs. Alternating-current generators, polyphase induction motors, synchronous motors, selsyn transmitters and receivers, and single-phase motors of all types are disassembled and their construction studied. Various circuit-protective and switching equipment are connected from a test panel to motors and tested. All types of electrical measuring equipment are tested by application.

		LEC.	LAB.	TERM UNITS
INDUSTRIAL SAFETY	**4.108**	**3**	**0**	**3**

A survey of the principles of safety for industry. Includes safety codes, personnel considerations, and safety practices relating to design work, materials handling, and equipment.

INDUSTRIAL TELEVISION	**6.228**	**2**	**3**	**3**

A theory and lab course designed to cover television systems, scanning and synchronization, composite video signal, frequency modulation, television receivers and monitors, picture tubes, power supplies, video amplification, practical design of video amplifiers, brightness-control and D-C reinsertion video detection automatic gain-control and sync-separation, and deflection oscillator and amplifier circuits.

INDUSTRIAL TELEVISION	**6.235**	**1**	**2**	**1**

A theory and lab course covering closed-circuit television systems, picture transmission, scanning process and the composite signal, camera tubes and circuits, camera video amplifier systems, camera sync and deflection generators, and several types of commercial industrial cameras with emphasis on circuit analysis, set-up procedure, operation, and adjustment.

INTRODUCTION TO AUTOMATIC DATA PROCESSING	**6.900**	**3**	**2**	**4**

A basic orientation to the field of Automatic Data Processing. Emphasis on the growing technology in the field of processing business data and how this growth in business, industry, and government has necessitated the automation of business routines. Applications of input-output preparation, manipulation of data in automated systems, communication with data processing machines, and computer languages.

INTRODUCTION TO BUSINESS & PUBLIC ADMINISTRATION	**2.502**	**3**	**0**	**3**

A basic background course in the general fields of business aimed at developing an awareness of the nature of the business in the capitalistic system. Included are problems of ownership, organization, personnel, finance, marketing, and managerial and governmental control. This course or its equivalent is prerequisite to all professional courses in Automatic Data Processing. The nature of public administration, its rules, trends, and functions. Study of government corporation; finances and controls.

INTRODUCTION TO ELECTRIC ACCOUNTING MACHINES	**6.913**	**3**	**3**	**4**

The nature and purpose of electro-mechanical machine operation. Principles and practice of punch card operations including key punches, interpreters, verifiers, sorters, collators, reproducers, accounting machines, and calculating punches. Prerequisite: Accounting 6.920

INTRODUCTION TO FABRICATION PRACTICES	**4.100**	**2**	**6**	**4**

An introductory course of observation and drafting. Students will be assigned drawing projects and will normally view the physical object of the drawing in order to develop their visualization of the subject on the drafting board. Frequent field trips should be made to observe modern methods of manufacturing, casting, forging, construction, and assembly at local industry. Emphasis will be placed on materials, methods of fabrication, glossary, scaling for drawing, and visualization of fabricated objects or assemblies.

		LEC.	LAB.	TERM UNITS
INTRODUCTION TO PROGRAMMING	**6.903**	**3**	**3**	**4**

Theory and practice in solving business data processing problems on modern digital computors. Principles of problem analysis, block diagramming, coding and checkout of programs.

INTRODUCTION TO SPECIFICATIONS **4.102** **3 0 3**

This is a course designed to acquaint the student with the common usage and practice in preparation and interpretation of specifications. Examinations of existing specifications covering current subjects will be used whenever possible with practical problems to teach the application of theory learned.

INTRODUCTION TO SYSTEMS AND PROCEDURES **6.902** **3 0 3**

Procedures as a basic administrative technique. The principles of organizing, planning and administering a procedure program. Methods of carrying out individual systems and procedures studies. Procedures analysis and improvement techniques, the role of systems and procedures in business management, systems charting, working simplification and measurement.

JOB MACHINING PRACTICES **4.845** **3 12 7**

This course covers typical job shop applications. Students repair and manufacture a variety of machines, equipment, parts, and tools. Typical job shop sequence will be followed with emphasis on speed and quality of finished product.

LATHE PRACTICES **4.831** **2 4 3**

This is a course which introduces engine lathe work and practices. Studies of lathe construction, function, operation and care of lathes are included. Operations such as facing, drilling, turning, and parting are performed by students during laboratory periods.

LIGHT SHEET METAL DRAFTING **4.147** **0 6 2**

A study of pattern development, basic die development techniques, and steps of fabrication for light sheet metal construction as applied to the electronic-electrical industry. Production design and layout for chassis, raceways, ducts, and metal cabinets are included.

Prerequisites: Sixth term standing or approval of dept. head.

MACHINE DESIGN **STVS** **3 2 4**

A course in which the design principles of machine elements are taken up and calculations are made in determining the size and shape of various machine parts. It includes factors which influence the selection of the materials to be used in designing such elements as beams, bearings, clutches, brakes, shafts, bushings, screws, rivets, gears, belts, and flywheels. Attention is given to various types of loading conditions, stresses, deformations, fits, finishes, and other factors which must be considered in the design of machine elements.

Prerequisite: Fourth Term standing or consent of Instructor.

MACHINERY REPAIR & RECONDITIONING

		LEC.	LAB.	TERM UNITS
	4.851	3	6	5

This course is a study and application of theories and methods of machine tool repair. The student will utilize laboratory time for reconditioning and repair practices. Included in the course are such areas as: the hand scraper; spotting tools; levels and leveling; gibs; grooves; frosting techniques; slides and ways; power transmission; construction studies; etc. Prerequisite: Fifth Term standing or approval of dept. head.

MACHINE SHOP AUTOMATION 4.824 2 0 2

A study of theory and practices of automation. Mechanical, numerical card and tape controls will be studied. History, theories, trends and applications of automated machines will be given attention. Field trips will be scheduled to supplement classroom activities.

MACHINE SHOP PRACTICES 4.841 3 6 5

This course stresses the working conditions of a typical machine shop. Students will be assigned projects that will require the related technical information and shop skills previously acquired. Instruction will include advanced theory application and extended machine operations. Speed and accuracy will be considered of paramount importance.

MACHINE SHOP PRACTICES 4.843 3 6 5

A continuation of the emphasis on industrial working conditions. Advanced projects requiring the utilization of previously acquired skill and knowledge. Theory classes will be devoted to problem solving and further applications of machcine shop theories. Laboratory hours will be spent in machine tool operations with speed and accuracy of prime importance.

MACHINE SHOP PROBLEMS 4.820 3 0 3

An applied mathematics course. Typical machine shop problems are solved with the aid of mathematics. Sections covered include powers and roots of numbers; segments of circles; transportation of various formulae; practical trigonometry; geometrical figures; practical application of logarithms; figuring tapers; tolerances and allowances; and gearing problems.

MACHINE SHOP PROJECT DRAFTING

4.823 0 4 2

This course combines machine shop knowledge with drafting procedures. Students will design selected projects for fabrication in the shop. The development of working drawings and the use of these drawings in manufacturing industries are studied. The development of perspective views and isometric projection is also included.

MANUFACTURING PROCESSES I STVS 2 3 3

This course is designed to provide a background of knowledge covering the various manufacturing materials and fundamental types of manufacturing methods as employed in cold working processes. Through lecture, demonstrations and practical applications, the student is given opportunity to become familiar with the various types of machine tools, tooling, measuring, and inspection procedures. Automation is introduced and information is presented to acquaint the student with modern practice of numerical control for machine tools.

		LEC.	LAB.	TERM UNITS
MANUFACTURING PROCESSES II	**STVS**	**2**	**3**	**3**

This course is designed to provide a background of knowledge coverin the various manufacturing materials and fundamental types of manufac turing methods as employed in hot working processes. Through lecture, demonstration, and practical applications, the student becomes familiar with various types of welding processes and their applications. Certain special machine operations such as ultrasonic electrical discharge, electro-arc, and chemical milling are studied.

Prerequisite: Manufacturing Process I or approval of dept. head.

MANUFACTURING PROCESSES III	**STVS**	**2**	**3**	**3**

This course is designed to provide a background of knowledge covering the various casting and foundry practices. Through lectures, demonstrations and discussions the student becomes familiar with the production of simple molds, cores and castings and in basic heat treatment, inspection and testing using both destructive and non destructive methods.

MAPPING AND COMPUTING	**6.131**	**0**	**4**	**2**

Advanced map plotting, earthwork computation, field surveying from maps; legal description; subdivision planning and simulated problems of construction are used.

Prerequisite: Fourth Term standing or approval of dept head.

MAPPING AND COMPUTING II	**6.133**	**0**	**6**	**2**

A study of surveying laws, public land survey procedures, professional surveyor practices, earth work computations and map projections. The student will lay out a highway section, prepare a zone, change map, retrace a government survey, compute earth quantities from a topograph map. Students will perform related operations such as verification o ownership and conformance with zoning laws or similar projects.

Prerequisite: Mapping and Computing 6.131 or equivalent.

MAPPING AND PLATTING	**4.131**	**1**	**7**	**3**

Principles of map platting using field survey data. Office procedure: basic earthwork computation, legal description, and subdivision planning. Simulated problems are used for application of principles.

Prerequisite: Fourth term standing or approval of dept. head.

MATERIALS OF CONSTRUCTION	**6.108**	**2**	**0**	**2**

Comparisons of various materials, their source, method of manufacture, physical and chemical properties; grading under a variety of conditions; soil and terrain as encountered in construction work.

Prerequisite: Approval of dept. head.

		LEC.	LAB.	TERM UNITS
MECHANICAL DRAFTING	**4.109**	**0**	**4**	**2**

An advanced course emphasizing mechanical design. It includes sketching, cam and gear layout, isometric drawings, welding drawings, tolerances and allowances, and tool jig drawings. Simplified drawing techniques will be covered and general shop procedures will be discussed. Emphasis will be placed on the industrial requirements of drawings.

Prerequisite: Third Term standing or approval of dept. head.

MECHANISMS I	**STVS**	**3**	**3**	**4**

A course dealing with the analysis of the motion characteristics of mechanism of existing design and the applications of this study in the design of a mechanism to provide desired motion characteristics. In the motion study, absolute and relative velocities, accelerations and the use of instant centers are discussed. Centrodes are studied as they apply to mechanism. The use of belts and linkages are illustrated by problems. Cam layout is taken up in detail and appropriate problems are solved.

Prerequisites: Tech Math 6.266; Physics 6.370 or Approval of dept. head.

MECHANISMS II	**STVS**	**3**	**3**	**4**

Second in a series of two courses dealing with basic mechanisms. This course deals with an analysis of the characteristics of gearing. The design and application of various gearing employed in modern industry are included. Practical problems are used in the study of gearing. Attention is also given to such mechanics as ratchets, pantographs, valves, clutches, and universal joints.

Prerequisite; Mechanisms I

METALLURGY I	**STVS**	**3**	**2**	**4**

This course covers principles relating to ferrous metals; their formation and production; properties of metals; uses of metals; hardening and temperings and hardness testing. Laboratory time is provided for demonstrations and experiments to aid classroom studies.

METALLURGY II	**STVS**	**3**	**2**	**4**

A continuation of Metallurgy I with introduction of non-ferrous metals. Formation, uses, production, heat treating and hardness testing. Laboratory time is provided for demonstrations and experiments to aid class room studies.

Prerequisite: Metallurgy I

METALS APPLICATION TREATMENT & TESTING	**4.106**	**2**	**3**	**3**

A survey course in metallurgy covering the common materials of fabrication, metals coding systems, characteristics, methods of refining and alloying, and methods of treating. The goal of the course is to acquaint the student with the various types and the working of metals used by industry.

		LEC.	LAB.	TERM UNITS
MICROWAVES	**6.242**	**2**	**3**	**3**

A theory and laboratory course designed as an introduction to microwaves. Begins with a study of ultra-high frequencies to develop a good foundation for the development of wave-guides and microwave circuitry. Covers UHF transmission lines, the application of quarter-wave lines, matching stubs, and standing wave measurements. Transmission of microwave energy through wave guides is analyzed and the TE and TM modes of transmission are studied. Various types of waveguide plumbing including choke joints, directional couplers, flap-attenuators, horns, guide partitions, and flexible waveguides are studied. Also includes cavity resonators, high-frequency oscillators, magnetron and klystron oscillators, the resnatron, traveling wave tubes, and other high frequency tubes and devices. Various types of UHF and microwave antennas and receiver circuitry are included. Microwave measurements involve the use of thermocouple voltmeters, bolometers, cavity wavemeters, slotted lines, and directional couplers.

Prerequisite: Sixth Term standing or approval of dept. head.

MILLING MACHINE PRACTICES	**4.835**	**2**	**4**	**3**

A course in fundamental milling machine work, studies of construction, types, attachments, and operation of milling machines. Laboratory time is provided for demonstrations and for individual student operation of equipment.

OFFICE MACHINES	**2.521**	**1**	**3**	**2**

This course covers the principles and functional applications of office machines used in the mathematical accounting field, such as adding machines, calculators, comptometers, and bookkeeping posting machines.

OSCILLATOR CIRCUITS & DESIGN	**6.212R**	**2**	**0**	**2**

A continuation of vacuum tube and transistor analysis. Involves the study of single-phase rectifier circuits and filters with calculation of the ripple-factor. Introduces the fundamental feedback equation and covers positive and negative feedback. Various types of feedback oscillators including the Hartley and the Colpitts are analyzed. Covers negative-resistance oscillators, miscellaneous sine-wave oscillators, non-sinusodial oscillators, including various multivibrator circuits. The principles of AM and FM modulation and detection are studied and the theory and application of the cathode-ray oscilloscope is included.

Prerequisites: Vacuum Tube and Transistor Analysis 6.210R and Vacuum Tube and Transistor Analysis Lab. 6.211R and Technical Math. 6.26

OSCILLATOR CIRCUITS & DESIGN LAB.	**6.213R**	**0**	**6**	**2**

Practical application of the theory studied in Oscillator Circuits and Design 6.212R. Involves the testing of half-wave and full-wave single-phase rectifier circuits and measurement of the D-C output and ripple-voltage. Includes the construction and testing of Harley, Colpitts, Armstrong, electron-coupled, crystal, tri-tet, phase-shift, Wein-bridge, and other types of feedback and negative-resistance oscillators. Grid, cathode, screen and plate AM modulation are tested and checked for percentage by means of an oscilloscope. The reactance tube modulator is constructed and tested

for FM modulation. The cathode-ray oscilloscope circuits are analyzed. Frequency-comparisons are made with Lissajous' patterns and Z-axis modulation. Applications and proper techniques for use of the oscilloscope are also included.

PHOTO INTERPRETATION & MAPPING 4.112 3 4 4

Principles of preparing maps and charts from aerial photographs by ground surveying and stereoscopic methods using standard computational forms. Prerequisite: Sixth term standing or approval of dept. head.

PICTORIAL DRAFTING 4.149 0 3 1

A concentrated study of the development of pictoral wiring diagrams for instructional, demonstration, or sales purposes. Use of drafting template and instrumental drawings will be emphasized.
Prerequisite: Sixth term standing or approval of dept. head.

PLANE SURVEYING 6.101 1 6 3

A beginning course in surveying techniques designed to give the student an understanding of the fundamentals of chaining and leveling, care and adjustment of surveying instruments and office procedures. Provision is made by appropriate field work for practical application of the techniques learned.

PLANE SURVEYING 6.103R 1 6 3

A continuation of Plane Surveying 6.101 designed to familiarize the student with the engineer's transit and its uses and an introduction to stadia surveying and leveling.
Prerequisite: Plane Surveying 6.101 and Tech Math 1.260R or equivalent.

PRACTICAL HYDROLOGY 6.535 3 0 3

A study of hydrology including Introduction to Geology, ground waters, stream flow or runoff, variations in runoff or stream discharge, floods and flood flows, and applications of hydrology.
Prerequisite: Fifth term standing or approval of dept. head.

PRODUCTION PLANNING & PRACTICES 4.104 3 2 4

This course will introduce elements of production control and planning such as: machine routing, steps of fabrication, efficient shop layout, materials handling, storage problems, and production records.
Prerequisite: Second year standing or approval of dept. head.

PROJECT DRAFTING 4.119 1 9 4

This course emphasized working conditions of the industrial drafting room. Students will be assigned projects that will include one or more drawings requiring all of the skills previously acquired. Instruction will include the methods for detail layout, reading specifications, common materials of fabrication, checking and back checking drawings, and material takeoffs. Discussion will cover the administration of the drafting room, issuing drawings and revisions. Speed and accuracy will be considered of paramount importance.
Prerequisite; Drafting 4.105 which may be taken concurrently.

		LEC.	LAB.	TERM UNITS
PROJECT DRAFTING	**4.121**	**0**	**8**	**3**

A continuation of the emphasis on industrial working conditions. Student will be assigned projects (requiring use of all previously learned skills and principles) that will familiarize them with many of the specialized fields of drafting. Instruction will include the basic methods for layout and detailing assemblies and sub-assemblies, reading specifications, common materials of fabrication, checking and back checking drawings, and materials takeoffs. Drafting room standards of various industries will be discussed. Speed and accuracy will be considered of paramount importance.

Prerequisite: Project Drafting 4.119 or equivalent.

PROJECT DRAFTING	**4.145**	**1**	**9**	**4**

A project drafting course emphasizing actual working conditions and drawing requirements. Diversified drawing project assignments will require the application of all previously acquired skills. Instruction will include speed dimensioning (co-ordinate dimensioning) use of drawing index, drafting room administration, co-ordination of specification and design, checking and backchecking methods, revisions, material take-offs, and different methods representing circuits and circuit components.

Prerequisite: Sixth term standing or approval of dept. head.

PROPERTY SURVEYING	**6.511**	**1**	**3**	**2**

An introduction to property surveying including description, study of rights, property transfer, location of metes and bounds, locating subdivisions and conveyances lacking senior rights; claims, sectionalized land, deeds, and duties of the surveyors are also covered. Laboratory work includes use of public records to trace titles, surveys and preparation of descriptions.

Prerequisite: Second term standing or approval of dept. head.

RECORDS AND REPORTS	**2.517**	**1**	**3**	**2**

This is a specialized treatment of records and has as its purpose developing the students' ability to prepare the many kinds of management data needed to guide a business operation other than the financial data furnished by the bookkeeping system. Reports, legal records, insurance records, personnel records, equipment records, sales and production records, visual reports, and assembly of data receive emphasis.

ROAD & HIGHWAY DRAFTING	**4.129**	**1**	**6**	**3**

Advanced course in drafting including profiles, grades, beds, routes, cross-sections and details of bridge constructions, and hard-and-dirt-surfaced roads. Emphasis is placed on drafting requirements for roads built by government agencies and private companies.

Prerequisite: Fourth term standing or approval of dept. head.

		LEC.	LAB.	TERM UNITS
ROUTE SURVEYING	**6.507**	**1**	**6**	**3**

An introduction to route survey problems including plans and profiles, distances, curves and grades, and circular curves. Laboratory work includes road layout on simple terrain, preparation of preliminary maps, and layout of road curves.

Prerequisite: Fifth term standing or approval of dept. head.

ROUTE SURVEYING	**6.509**	**2**	**6**	**4**

A continuation of Route Surveying 6.507 on an advanced basis, including complex curves, curve superelevation and widening, turn-out, connection and crossing problems, and drainages survey and facility problems. Laboratory work includes solution of related problems and curve layout.

Prerequisite: Sixth term standing or approval of dept. head.

SCALES & GRAPHS	**4.139**	**0**	**6**	**2**

An advanced course covering the techniques of design and layout of meter scales and graphs. Instruction includes methods of calculating the layouts for square root, logarithmic, semi-logarithmic, meter scales, etc. Layout and drawing techniques for co-ordinate, logarithmic, and polar graphs are also covered. Skills in inking procedures, use of the French curves and adjustable splines will be developed.

Prerequisite: Fourth term standing or approval of dept. head.

SEMI-CONDUCTORS	**6.234**	**2**	**0**	**2**

This course covers the physical principles underlying the behavior of semi-conductors, transistors, and other solid state devices, as well as their application to various electronic circuits. The physics pertinent to transistors and semi-conductors is discussed as are their characteristics and the ways in which they operate. The use of transistors in various amplifiers, oscillators, and switching circuits is covered with emphasis on developing concepts and knowledges basic to transistor and semi-conductor theory and practice.

Prerequisite: Electronics 6.214 and Electronics Lab 6.215 or equivalent.

SERVO SYSTEMS	**6.236R**	**1**	**3**	**2**

Presents the principles of servo and data transmission systems with emphasis on fundamentals. Covers control systems and servo-mechanisms, elementary forms of control systems, servo systems, synchros, servo elements, electronic and magnetic amplifiers, direct current servomotors, performance improvers methods for servos and measurement, and examples of servos and servo systems.

Prerequisite: Industrial Electronics 6.218R

		LEC.	LAB.	TERM UNITS
SHAPER PRACTICES	**4.825**	**2**	**3**	**3**

This is a course devoted to the introduction, care, and function of the metal-working shaper. The various parts and attachments, feeds, speeds and adjustments, and tooling will be discussed. Laboratory time is provided for supervised operation of the shaper.

Prehequisite: Curriculum entrance requirements.

SOIL MECHANICS **6.124** **2 3 3**

A study of index of properties of soil, hydraulic and mechanical properties, soil drainage and plastic equilibrium. Laboratory experiments and projects cover each phase of study.

Prerequisite: Second year standing or approval of dept. head.

SOIL MECHANICS **6.526** **3 0 3**

Soil exploration, earth pressure and stability of slopes, foundations and causes of settlement are covered with the use of demonstrations and other training aids wherever practical.

Prerequisite: Sixth term standing or approval of dept. head.

STRENGTH OF MATERIALS **6.107T** **2 0 2**

A study of the stresses and strains that occur in bodies when subjected to tensile, compressive and shearing forces, including the common theory of beams. The distribution and magnitude of stresses are examined in welded and riveted joints, thin wall cylinders, torsional members and beams. Practice problems emphasize the materials studied.

Prerequisite: Applied Mechanics 6.109 and Tech Math 6.266 or equivalent

STRENGTH OF MATERIALS LAB. **6.107** **0 3 1**

Principles of materials testing and loads measurement. Experiments include application of testing equipment to structural materals and calibration of testing equipment.

Prerequisite: To be taken concurrently with Strength of Materials 6.107T

STRENGTH OF MATERIALS II **6.128** **2 3 3**

A study of the design and deflection of beams and a study of the combination of forces and their effects upon various structural members. This course includes a study of failure of structural connection and laboratory tests of materials.

Prerequisite: Strength of Materials 6.107 and 6.107T or equivalent.

STRUCTURAL ANALYSIS & DESIGN 6.130 **1 3 2**

The course deals with the determination of stresses induced by loads on structures of wood, steel, concrete, selections of appropriate structural members and suitable connections; loading conditions causing compression, tension, shear, torision, and bending; practical design procedures, relating to various structural members, beams, girders, columns and footings.

Prerequisite: Applied Mechanics 6.109; Strength of Materials 6.107 and 6.107T.

		LEC.	LAB.	TERM UNITS
STRUCTURAL DRAFTING	**4.111**	**0**	**4**	**2**

An advanced course emphasizing civil and structural drafting procedures. It includes the function and design of; the general plan, stress diagrams, shop drawings, foundation or masonry plans, erection diagrams, falsework plans, and sheet metal layout. Also, bill of materials, rivet lists, drawing indexes, design considerations, and strength of joints will be covered. The student will become acquainted with structural shapes: bridges, dam, and earthwork constructions.

Prerequisite: Sixth term standing or approval of dept. head.

SURVEYING COMPUTATIONS	***6.500***	**1**	**6**	**3**

A study of trigonometric and geometric formulas, logarithms, mechanical computers and integrating instruments, area computations, traverse calculations, leveling, plotting surveys. Field trips and problems will be used as needed.

Prerequisite: Third term standing or approval of dept. head.

TECHNICAL ILLUSTRATIONS	**4.127**	**0**	**4**	**2**

This course will introduce the techniques required for modern technical illustrations and drawings such as those found in catalogues, published presentations or exploded drawings. Both freehand drawing and template drawing will be covered. Balance, surface rendering, kinds of drawing implements, pencils, brush and techniques of light and shadow will be discussed.

Prerequisite: Second year standing or approval of dept. head.

TIMBER & STEEL CONSTRUCTION	**6.125**	**3**	**3**	**4**

A study of steel and wood fasteners and connections, timber beams and columns. Structural members will be analyzed for design features. Field trips will be used to visualize application. Laboratory time will be used for testing.

Prerequisite: Structural Analysis and Design 6.130 or equivalent.

TOOL & FIXTURE DESIGN AND APPLICATION	**4.847**	**2**	**4**	**3**

An overview of design and machining of tool fixtures and jigs. Applications of drill jigs, special work holding devices, indexing work holders, templates for form turning and other applications. Class time is devoted to design and theory of design with laboratory time spent on the fabrication and machining of special fixtures for production runs.

TOPOGRAPHICAL SURVEYING	**6.517**	**1**	**6**	**3**

A course in preparation of topographical maps including filling in detail and plotting and finishing maps. Topographical surveying problems are included. Laboratory work includes making surveys and preparation of maps from notes gathered.

Prerequisite: Fourth term standing or approval of dept. head.

		LEC.	LAB.	TERM UNITS
TRAFFIC ENGINEERING	**6.553**	**3**	**0**	**3**

A study of traffic engineering and controls. Such topics as traffic characteristics, controls, illumination, regulation, design, surveys, route analysis, and planning are covered.

Prerequisite: Sixth term standing or approval of dept. head.

VACUUM TUBE & TRANSISTOR ANALYSIS

6.210R **3 0 3**

An introductory course to the analysis of the electrical characteristics of vacuum tubes and transistors. Includes a review of electron physics with emphasis on electron emission and fundamental transistor theory. Covers two element electron devices including hot and cold-cathode vacuum and gas diodes and semiconductor diodes; three element vacuum tubes and transistors; multi-grid tubes including tetrodes, pentodes, and beam-power tubes; special transistors and diodes. Includes a review of auxiliary electronic components including potentiometers, transformers, and relays, and a review of several electronic circuits involving series and parallel resonance, bandwidth and coupled-circuit theory. Also covers elementary filter design, harmonic analysis, network theorems, and four-terminal networks.

Prerequisite: Third term standing or approval of dept. head.

VACUUM TUBE & TRANSISTOR ANALYSIS LAB.

6.211R **0 3 1**

Practical application of the theory studied in Vacuum Tube and Transistor Analysis 6.210R. Involves the disassembling of diodes, triodes, tetrodes, pentodes, and multigrid tubes, and transistors to observe their construction. Also includes the plotting of the electrical characteristics curves of vacuum tubes and transistors. The plotted curves are used in determining transconductance, the amplification factor, and plate-resistance of vacuum tubes and the current-gain of junction transistors in various circuit configurations. The operation of the Thyraton is tested with A-C and D-C plate voltages, using a phase-shifter for grid-control. Includes the testing of Zener and double based diodes and special transistors such as the PNPN. Transformer-coupled theory is verified by testing out under-coupled, optimum-coupled, and over-coupled coils. Gain of amplifiers is computed in decibles and auxiliary audio elements such as microphones, speakers, and tape-recorders are reviewed.

Prerequisite: Third term standing or approval of dept. head.

		LEC.	LAB.	TERM UNITS
WAVE GENERATION & SHAPING	**6.234R**	**2**	**3**	**3**

A class and laboratory course designed as an introduction to pulse techniques. Begins with an introduction to pulses, giving their historical development, typical applications, nomenclature, importance of pulse shapes, and responses of frequency-selective circuits to pulses. Includes the theory and operation of limiter and clipper circuits, differentiating and integrating circuits, and D-C restoration. Various multivibrator circuits, synchronization circuits, and applications of multivibrators are studied. Also covers blocking oscillators of several types, their principle of operation, and application.

Prerequisite: Fourth term standing or approval of dept. head.

WELDING **4.150** **1 3 2**

This course may be taken in two terms of 1 class and 3 laboratory hours per week as Welding 4.150 (2 Term Units) and Welding 4.151 (2 Term Units). Set-up and operation of oxy-acetylene and electric arc welding equipment. Demonstrations and practice in welding, brazing, and soldering ferrous and non-ferrous metals and their alloys. Various types of welds are made and tested. Technical information is correlated with actual practice to provide the student with an understanding of the composition of the various metals and methods of fabrication used in construction, maintenance, and repair industries.

WELDING **4.151** **1 3 2**

This course may be taken in two terms of 1 class and 3 laboratory hours per week as Welding 4.150 (2 Term Units) and Welding 4.151 (2 Term Units). Set-up and operation of oxy-acetylene and electric arc welding equipment. Demonstrations and practice in welding, brazing, and soldering ferrous and non-ferrous metals and their alloys. Various types of welds are made and tested. Technical information is correlated with actual practice to provide the student with an understanding of the composition of the various metals and methods of fabrication used in construction, maintenance, and repair industries.

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