

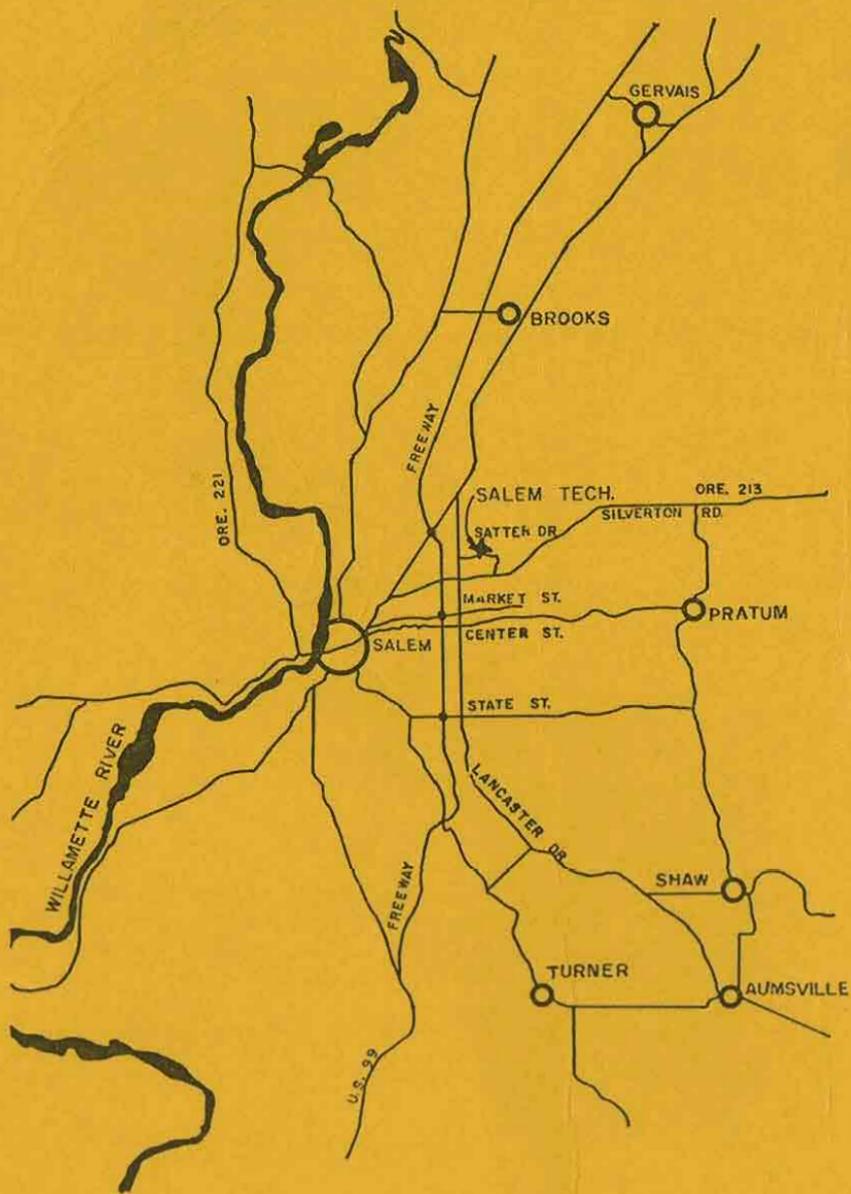
*Salem* TECHNICAL VOCATIONAL  
*Community College*

SALEM PUBLIC SCHOOLS

**CATALOG**  
1968 • 1969



## Highways leading to Salem Tech



# SALEM TECHNICAL VOCATIONAL COMMUNITY COLLEGE

4389 Satter Drive N.E.

Salem, Oregon



## CATALOG 1968 - 1969

A Public Area Education Center Serving  
MARION, LINN and POLK COUNTIES

OPERATED BY SCHOOL DISTRICT No. 24J  
SALEM PUBLIC SCHOOLS

# School District 24J

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Technical Vocational Education

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# Academic Calendar

## Fall Term — 1968-69

Sept. 23-25	(Mon.-Wed.)	.....	New Student Orientation
Sept. 26-27	(Thur.-Fri.)	.....	Registration
Sept. 30	(Mon.)	.....	Classes in regular session
Oct. 1	(Tue.)	.....	Last day to register without penalty
Oct. 11	(Fri.)	.....	Last day to register for Fall Term
Oct. 11	(Fri.)	.....	Last day of make program changes
Nov. 4-7	(Mon.-Thur)	.....	Midterm Evaluation
Nov. 11	(Mon.)	.....	Veterans' Day Holiday
Nov. 19	(Mon.)	.....	Last day to withdraw from classes
Nov. 28-29	(Thur.-Fri.)	.....	Thanksgiving Vacation
Dec. 2-6	(Mon.-Fri.)	.....	Schedule planning for Winter Term
Dec. 17-19	(Tue.-Wed.-Thur.)	.....	Final examinations
Dec. 20	(Fri.)	.....	Fall Term ends

## Winter Term — 1968-69

Jan. 6	(Mon.)	.....	Registration
Jan. 7	(Tue.)	.....	Classes in regular session
Jan. 7	(Tue.)	.....	Last day to register without penalty
Jan. 17	(Fri.)	.....	Last day to register for Winter Term
Feb. 10-13	(Mon.-Thur.)	.....	Midterm Evaluation
Feb. 21	(Fri.)	.....	Last day to withdraw from classes
Mar. 3-7	(Mon.-Fri.)	.....	Schedule planning for Spring Term
Mar. 18-20	(Tue.-Wed.-Thur)	.....	Final examinations
Mar. 21	(Fri.)	.....	Winter Term ends

## Spring Term — 1968-69

Mar. 31	(Mon.)	.....	Registration
Apr. 1	(Tue.)	.....	Classes in regular session
Apr. 1	(Tue.)	.....	Last day to register without penalty
Apr. 11	(Fri.)	.....	Last day to register for Spring Term
May 5-8	(Mon.-Thur)	.....	Midterm Evaluation
May 16	(Fri.)	.....	Last day to withdraw from classes
May 30	(Fri.)	.....	Memorial Day Holiday
June 10-12	(Tue.-Wed.-Thur.)	.....	Final Examinations
June 13	(Fri.)	.....	Graduation Exercises
June 13	(Fri.)	.....	Spring Term ends

## Fall Term — 1969-70

Sept. 22-24	(Mon.-Wed.)	.....	New Student Orientation
Sept. 25-26	(Thur.-Fri.)	.....	Registration
Sept. 29	(Mon.)	.....	Classes in regular session

# Faculty

- ACKERMAN, Winona B. (1968)**  
Emanuel School of Nursing (1943)  
B.A. University of Puget Sound (1961)
- BALL, Harold L. (1968)**  
Humboldt State College  
B.S. University of California (1960)
- BERG, Betty M. (1963)**  
A.A. South Dakota State College. Ten years experience in business field.
- BETTERTON, Roe (1968)**  
Oklahoma A.&M. Junior College  
M.Ed. University of Oregon (1959)  
B.S. University of Oregon (1955)
- BLAKNEY, Clement D. (1965)**  
B.S. Oregon State University (1949). Industrial experience in wood industries and production.
- BLANK, Franklin W., Jr. (1961)**  
B.A. Business Administration, Willamette University (1953). Nine years experience Business and Personnel Management.
- CIRCLE, Melvin W. (1957)**  
Sacramento Junior College. B.S. Oregon State University (1968)
- COLE, Henry T. (1963)**  
B.S. Oregon State University (1959). M.Ed. Oregon State University (1961).
- COOK, Conrad (1964)**  
Oregon State University. Registered Professional Land Surveyor. Certified Data Processor. Ten Years Business Ownership. Eleven Years Electronic Data Processing.
- DAVEY, Stanley H. (1965)**  
Oregon State University, Lower Columbia Junior College. Eleven years business and industrial experience.
- DEISCHER, Mildred E. (1964)**  
B.S. and M.S. Home Economics Education, Iowa State University. Advanced graduate study at Columbia University and Oregon State University. Experience in high school, college teaching, and in State Home Economics Education Supervision.

- DODGE, Thomas I. (1964)  
Lewis & Clark College. Nine years sheet metal fabrication and installation experience.
- DUBY, Mary (1967)  
B.S., Nursing Education, Lewis and Clark College (1953).  
M.S., Teaching and Supervision in Nursing Education, University of Oregon (1962).
- DUFFIELD, Donald E. (1967)  
Drilling Contractor, 22 years experience. Supervisor in Division of Weights and Measures, State Department of Agriculture.
- ELLING, Kay C. (1967)  
B.A. Willamette University (1960). M.Ed. Willamette University (1964).
- EMERSON, Willard B. (1966)  
B.S. Oregon State University (1963). Seven years fire-fighting and fire training experience.
- FOSTER, Margaret L. (1967)  
Names-Boling Business College (1943). B.S. Oregon State University (1949) .
- FOSTER, Selma A. (1963)  
Tabor College, Hillsboro, Kansas. Ten years dental assisting experience, Certified Dental Assistant.
- GUSTAFSON, Jean (1962)  
B.S. Oregon State University. M.S. Oregon State University (1940). M.L., Librarianship, University of Washington (1967).
- HADLEY, Marlyn M. (1966)  
Seventeen years experience in mechanical field. Twenty-two years foreman and supervisor in industrial fields.
- HATFIELD, Gladys E. (1963)  
B.S. Nursing Education, University of Oregon (1947). M.Ed. Oregon State University (1967). Six years teaching, five years experience in nursing.
- HEATER, Jerald R. (1967)  
Oregon State University. Varied Fireman Training Institutes.
- HESSMAN, Robert D. (1967)  
Selected Navy schools. (U.S. Navy Retired).
- JEPSEN, Leland R. (1965)  
B.S. Mechanical Engineering, Oregon State University (1950). Three years testing experience, U.S. Navy. Four years experience in construction.

- KASSELL, Richard M. (1965)**  
A.S. Salem Technical Vocational Community College, Data Processing (1965) University of Oregon. Fourteen years industrial experience, printing and allied trades.
- LATHAM, Robert S. (1964)**  
B.A. Colorado State College at Greeley (1950). M.Ed. Oregon State University (1963). Five years business experience, five years drafting and design experience.
- LEACH, Alvin M. (1966)**  
M.S. Oregon State University (1959).
- LOYD, A. Leon (1965)**  
B.S. Oregon College of Education (1964). Eight years experience in Data Processing.
- MAGUREN, Janet D. (1967)**  
Diploma, Emanuel Hospital School of Nursing (1953). B.S. University of Oregon (1962). Twelve years nursing experience.
- MASON, Patricia L. (1967)**  
Cascade College. Portland State College. B.S. University of Oregon (1963).
- MEFFORD, Harrison W. (1964)**  
Northern Idaho College of Education. B.S. Oregon State University (1968). Twenty years experience in civil engineering and construction fields.
- NEWMAN, Leah H. (1968)**  
Swedish Hospital School of Nursing (1931). B.S. University of Oregon (1962).
- NICHOLS, Victor (1962)**  
University of Washington. Seven years experience in machinist field, thirteen years boat building foreman, purchasing agent, and engineering.
- PINCKNEY, Dale E. (1968)**  
B.S. University of Utah (1947). Ten years teaching Social Science at the University of Montana.
- POHL, Leslie (1965)**  
Technical School of Budapest (1941). Los Angeles Valley College. Twenty-eight years experience as a tool and die-maker.
- RICE, Leonard (1960)**  
B.S. Industrial Arts Education, Oregon State University, (1959). Four years industrial experience, three years as Senior Draftsman.
- RICHARDSON, James A. (1965)**  
B.A. Chico State College (1959). Six years work experience in electronic engineering and mathematics.

- RONER, Bennie D. (1966)  
Twelve years television sales and repair.
- ROSS, Gertrude L. (1965)  
Southern California College. B.S. Southern Oregon College (1965). M.S. Oregon State University (1968). Ten years experience in cartographic drafting and photogrammetry.
- RUBY, George R. (1965)  
B.B.A. Business Administration, University of Minnesota (1950) M.Ed. University of Oregon (1963). Ten years experience in distributive business and management.
- RYAN, Coral R. (1967)  
B.S. University of Portland (1963). The Catholic University of America (1967).
- SALTER, Merlin E. (1966)  
B.S. Oregon College of Education (1965). Elementary and secondary teaching, extensive automobile repair and maintenance experience.
- SHEPARD, Lucile M. (1967)  
St. Mary's School of Nursing (1944). B.S. University of Portland (1950). M.Ed. Oregon State University (1967).
- SHOWERS, Keith M. (1965)  
B.S. Oregon College of Education (1963).
- SHOWERS, Lloyd D. (1966)  
B.S. Oregon College of Education (1958).
- SLONECKER, William (1963)  
A.A. University of Washington. B.S. Oregon State University (1968). Ten years experience as an electronics technician working on microwave and telemetering installations.
- SMITH, Joseph W. (1963)  
B.S. Forest Management, University of Washington (1951). Field Assistant, Rehabilitation Assistant, Oregon State Board of Forestry, Management Forester. Ten years forestry experience.
- SODERSTROM, Duayne M. (1966)  
B.S. Forest Products, Oregon State University (1951).
- TRAXLER, Mary E. (1968)  
Ancker Hospital School of Nursing (1941). B.S. University of Minnesota (1960).
- WADE, DeVon D. (1967)  
A.B. Asbury College (1952). M.A. University of Kentucky (1960).

WILBRECHT, Lloyd C. (1952)

A.A. North Dakota State School of Science. Purdue University, Mississippi Southern University, selected Air Force schools (U.S. Air Force, retired).

WILMETH, Paul F. (1952)

B.E. Oregon State University (1957). M.Ed. Oregon State University (1960).

### PART TIME INSTRUCTORS PREPARATORY

Listella, Guido  
Love, Cal

Tebeau, William  
White, Roger

### APPRENTICE

Bell, Charles	Inside Wire
Berns, Robert	Industrial Maintenance Electrician
Brickel, Don	Sheet Metal
Brown, Larry	Linoleum Layers
Davis, Lorne	Inside Wire
Henning, John	Mill man, Cabinet Maker
Jain, Lester	Carpentry
McConnell, David	Plumbers
Maude, Ralph	Carpentry
Meade, Elmer	Auto Mechanics
Meier, Frank	Plumbers
Munnings, William	Inside Wire
Nichols, Victor	Machinist
Nickerson, Ralph	Painters
Phillips, Elwin	Sheet Metal

### SUPERVISORY, TECHNICAL

Hughes, William C.  
Johnson, Kerby  
Loynes, Ernest

Shattuck, Gordon  
Stevens, R. E.

### HOME ECONOMICS EDUCATION FOR ADULTS

Arnold, Gail  
Buren, Richard  
Chapman, Lella  
Clausen, Doris  
Ericksen, Dorothy  
Elwell, Lois  
Ficklin, Alice  
Gailbraith, Joan

Hardwick, Dorothy  
Myers, Jo  
Murphy, John  
Redeye, Norma  
Shepard, Violet  
Varnum, Sara  
Vejluek, Lillis  
Whitteman, Floyd

## FIREMAN TRAINING

Cary, LaVern H.  
DeRoss, Ronald  
Ditter, Delbert  
Lee, O. W.  
Miller, W. C.  
Myers, James C.

Norton, Robert  
Pflughaupt, Walter  
Reinke, Donald  
Reynolds, Franklin G.  
Snook, Bernard  
Stettler, John D., Jr.

# Advisory Committees Of Salem Technical Vocational Community College

## CIVIL-STRUCTURAL AND DRAFTING TECHNOLOGY

Anderson, John A.  
Baker, George P.  
Morrow, Robert D.  
Richardson, Donald W.

## DATA PROCESSING TECHNOLOGY COMMITTEE

Giroux, Joseph  
LeTourneaux, George  
× Noegel, Joe  
- Peer, Donald F.  
× Price, Donald E.  
- Rice, Roy J.

## DENTAL ASSISTANTS PROGRAM COMMITTEE

Adams, Kenard W., D.M.D.  
Brutsch, James B., D.M.D.  
Humphrey, Irene E.  
Schultz, Mabel P.

## DRILL OPERATORS PROGRAM COMMITTEE

Anderson, Ronald  
Bartholomew, William S.  
Berry, Howard E.  
Huffman, Harlan M.  
Mackaness, Frank G.  
Robinson, Harry A.  
Strasser, Robert L.

## ELECTRONICS ENGINEERING TECHNOLOGY COMMITTEE

Berg, Norman  
Christenson, Robert W.  
Fields, Gene A.  
Johnson, M. G.  
Van Meter, Joseph C.

## FIRE PROTECTION TECHNOLOGY COMMITTEE

Brady, Paul J.  
Carpenter, Larry  
Harvey, Peter C.  
Milligan, Donald  
Shedeck, Glen H.  
Stender, Leonard  
Wood, Howard E.

## FOREST INDUSTRIES TECHNOLOGY COMMITTEE

Alley, Tom	Hughes, William G.
Bergman, Morris	Krueger, Otto C. F.
Ellicott, Ross	Walch, John

## HEALTH OCCUPATIONS PROGRAM COMMITTEE

Bodine, Donald P., Pharm.	Myers, Helen E., RRL
Bray, Don, M.D.	Nelson, James, OTR
Dormkowski, Jane	O'Brien, John R., M.D.
Emerson, June O.	Pierce, George, RN
Flesher, Gurnee A.	Pomeroy, James M., M.D.
Gilson, Layton J., RPT	Shangle, Verne G.
Harris, Arlene, RPT	Shiffer, Maynard C., M.D.
Herzog, Jerome A.	Singleton, Estelle, RN
Hiatt, Barbara G., RN	Sister M. Antoinette, OSB
Horner, Jack	Skirvin, Nancy H., Pharm.
Jetmalani, Naraindas B., M.D.	Stoddard, Joan E., RN
Krieg, Helen, R.N.	Swanson, Marie, RN
	Wedel, Irwin F.

## HIGHWAY ENGINEERING TECHNOLOGY COMMITTEE

Hill, Frank  
Huntley, Gene  
Merchant, Ivan D.

## HOME ECONOMICS COMMITTEE

Belton, Mrs. Howard C.	Leth, Mrs. Walter C.
Bunnell, Mrs. James E.	Lusted, Mrs. Keith
Elliot, Mrs. Vincent	Mort, Charles L.
Flesher, Gurnee A.	VanCleave, Mrs. Howard
Heringer, Maxine	Vejlupsek, Mrs. Donald
Hillstrom, Mrs. E. W.	

## INDUSTRIAL SUPERVISORS PROGRAM COMMITTEE

Butler, Roger	Lind, Genevieve
Hall, George A.	Walker, William
Henken, George P.	White, Douglas C.
Hibbard, William	

## MECHANICAL-MACHINE TECHNOLOGY COMMITTEE

Butler, Roger	Henken, George P.
Cummings, Truman	Lyman, Ronald G.
Day, L. B.	Walker, William
Gerlinger, Carl A.	

## MEDICAL ASSISTANT PROGRAM COMMITTEE

Clarke, Beulah	Much, Joseph C., M.D.
Hann, Delores V.	Prudente, Lucille
Lidbeck, William L., M.D.	Shangle, Verne G.
Lusted, Keith, M.D.	

## OFFICE OCCUPATIONS PROGRAM COMMITTEE

Carter, Lee	Lorenz, Jewell
Currie, Deryl G.	Ruettgers, Helen
Jaeger, Don	Seeley, Marion
Kleinschmit, Kay	Stiles, Everett B.
Kroepin, Mercel	

## PRACTICAL NURSE PROGRAM COMMITTEE

Best, Marguerite, LPN	Krieg, Helen, RN
Corley, Julia, RN	LeFor, Fae D., RN
Earls, Emmett S.	Renner, Betty, RN
Edwards, Thomas A., MD.	Ringstad, Carolyn, RN
Hansen, Blossom, LPN	Sullivan, Mary, RN
Hiatt, Barbara G., RN	Wedel, Irwin F.

## REAL ESTATE PROGRAM COMMITTEE

Black, John E.	Reimann, Leo
Brownell, Mary	Sherman, Kenneth
Crawford, Gordon	Stewart, Wesley E., Jr.
Gardner, Arne H.	

## TECHNICAL NURSING COMMITTEE

Detering, Etta Mae, RN	Shangle, Verne G.
Earls, Emmett S.	Shiffer, Maynard C., M.D.
Kahn, Alan	Springer, Carol, RN
Murray, Helen R., RN	Wedel, Irwin F.
Myers, Gladys, RN	

## TELEVISION-RADIO SERVICE PROGRAM COMMITTEE

Anderson, Frank	Payton, John J.
Heidt, Stan	Smith, Clinton F.
Lamer, Al F.	

# General Information

## History

In 1955, the Salem Technical Vocational Community College was established as a post high school institution to meet the increasing technical and vocational needs of Marion, Polk and parts of Linn counties. The school's first curriculum, February 1955, was in Machine Shop Practices.

Since 1955 programs have been added and expanded to cover many of the technologies, business and health occupations. A complete listing of the present offerings can be found in the table of contents of this catalog.

In 1963 the college was moved from an old site in West Salem to the present facilities on Satter Drive N.E. There is a continuing planning effort to design and develop additional space as the needs increase and the funds are available.

Through legislative and school board action, the name was changed, effective July 1, 1965, from Salem Technical Vocational School to Salem Technical Vocational Community College.

Salem Technical Vocational Community College is financially supported by funds from the State Department of Education, local School District and student tuition.

## Definition and Philosophy

One of today's most rapidly growing demands on education is for technical and vocational training to support business and industry and its required skilled manpower needs. The Salem Technical Vocational Community College's purpose is to meet these demands through its one and two year post high school programs. The college anticipates and provides for local needs with well planned and well organized occupational centered curricula in the field of technical and vocational education.

Instructors at Salem Tech are selected primarily for their proven competency in the occupational or subject area in which they will teach, educational background, and ability to impart this knowledge to others. The Technical-Vocational instructors retain contact with their occupational areas through close cooperation with advisory committees and summer employment in the field or area in which they teach.

The underlying philosophy of Salem Technical Vocational Community College is to develop and instruct youth and adults for useful employment as skilled and/or highly skilled individuals in recognized occupations. The development of skills,

abilities, attitudes, working habits and appreciations are all coordinated so that the graduate will enter and advance in his chosen occupation, and participate in the social and civil life of the community.

## **Academic Regulations**

### **Admission**

Admittance to Salem Technical Vocational Community College 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.

### **APPLICATIONS**

To be admitted to a program a student must submit an application for admittance accompanied by a \$10.00 registration fee which is applied to the student's tuition.

### **TRANSCRIPTS**

An official transcript of all high school and college records must be forwarded for evaluation.

### **APPLICATION FOR HEALTH OCCUPATIONS**

Applications for enrollment in one of the Health Occupation programs must be made as early as possible. Selection of students for enrolling in the Health Occupations is made in the early spring preceeding the fall in which the classes will start.

### **ENTRANCE EXAMINATIONS**

All persons applying for entrance 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.

### **Tuition and Fees**

Tuition and fees are payable in full at time of registration. 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 24J.

## TUITION

Full time student (In district) .....	\$ 95.00 per term
Full time students (Out of district) .....	\$120.00 per term
Part time students .....	\$9.00 per term unit
Out of state tuition .....	\$650.00 per year

## LATE REGISTRATION

A late registration fee will be charged in accordance with the schedule shown below:

Day of Term	Late Registration Fee
1st and 2nd	No charge
3rd	\$1.00
4th and 5th	3.00
6th to closing date	5.00

Registration will be closed after the day indicated in the Academic Calendar. The college will not accept student registration for the current term after this day, except part time extension courses or special program.

## OTHER FEES

Locker .....	\$2.50 per term
Transcript .....	\$.25

Each student is entitled to his first three copies free. Additional copies will be furnished at the rate of \$.25 ea.

Laboratory Fee .....	Varied
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Laboratory fees will be assessed as necessary.  
A schedule of lab fees will be made available at the time of registration.

## BOOKS and SUPPLIES

Books and supplies may be purchased at the college book store. The cost of books and needed supplies will vary, depending on the program. For example, in the Electronics program, a full time student can expect to purchase, during the first year, approximately \$60.00 worth of texts and roughly a like amount for necessary supplies.

## TUITION REFUND

Students who withdraw from the college 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 submitted on a withdrawal form at the 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. The following is the refund schedule adopted by the School District and is followed by the college. The registration fee will be

deducted before applying the below refund schedule in all cases of withdrawal from school, both in day and evening, part and full time.

During the first week .....	90% of tuition
During the second week .....	70% of tuition
During the third week .....	50% of tuition
During the fourth week .....	40% of tuition

### 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; F as failure; W indicates withdrawal; and Inc. as incomplete.

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 and withdrawals are disregarded in the computation of grade-point averages.

### INCOMPLETES

When a student has been in regular attendance in a class, but in the judgment of the instructor has failed to complete a minor portion of the required course work, an incomplete may be awarded. The incomplete must be made up within the following term and the grade recorded in the college office or the incomplete becomes an F. It is the student's responsibility to take care of incompletes.

### WITHDRAWAL

Students may withdraw from a course on or prior to the date indicated in the Academic Calendar by filing an official withdrawal form with the college office. A student who registers for a course is considered in attendance unless an official withdrawal has been made.

Students are expected to process withdrawals in person. Proper withdrawal is reflected on the student's transcript and protects his academic record.

### Graduation Requirements

Upon satisfactory completion of all program and degree requirements, students in two year programs are awarded an Associate in Science Degree. Students who are enrolled in one year programs are, upon satisfactory completion of program and certificate requirements, awarded the Certificate of Completion.

Awarding of the degrees and certificates is made at a formal graduation exercise which is conducted the evening of the date for graduation indicated in the Academic Calendar.

Approval for awarding the Associate in Science Degree was given to the Salem Technical Vocational Community College by the Oregon State Board of Education.

#### **REQUIREMENTS FOR ASSOCIATE IN SCIENCE DEGREE**

The Associate in Science Degree is awarded after the following requirements are met:

1. Satisfactory completion of all planned course work within a two year program.
2. Cumulative grade point average (GPA) of 2.00 or above.
3. A minimum of 18 term hours of selected general education courses or an approved equivalent.

#### **REQUIREMENTS FOR CERTIFICATE OF COMPLETION**

The Certificate of Completion is awarded after the following requirements are met:

1. Satisfactory completion of all planned course work within a one year program.
2. Cumulative grade point average (GPA) of 2.00 or above.

#### **APPLICATION FOR GRADUATION**

Students who are enrolled in two year programs working towards an Associate in Science Degree must submit written application for graduation and degree by the end of the first week of the winter term of the graduating year. Application forms will be made available to these students at registration for the winter term.

Students in one year programs for which the Certificate of Completion is awarded must submit written application for graduation and certificate before the end of the second week of spring term. Application forms will be made available to these students at registration for the spring term.

#### **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 of course descriptions.

#### **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 assistance will be given students completing programs and who are seeking jobs in the occupations for which they have been training.

The college coordinates and plans employer recruitment visitations to the school for the convenience of its graduates each spring.

### **Evaluation**

Certain courses within the curriculum may be waived if, upon evaluation of student's 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 content of the waived courses would be required by complying with procedures already established for such. It is the student's responsibility to petition for examination for formal credit.

Petitions for examination for formal credit must be submitted to the college office within the first week of the term in which the course is offered.

No student may take a special examination for credit in the term in which he completes his requirements for graduation.

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.

### **Counseling and Guidance**

A counseling and testing service is available to each interested individual in the community, without obligation. The service is offered to assist individuals with selecting and planning their educational futures in areas commensurate with their abilities and interests.

This service is especially helpful to young people who experience difficulty in choosing an occupation or an area of training.

### **Student Living Accommodations**

The college does not provide living accommodations, nor does the college assume any responsibility for arrangements the student may make. However, there is a wide range of living accommodations available in the Salem area.

The two Salem daily papers are the best sources of currently available accommodations.

### **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. Twenty-five hours per week of class (inc. lab. time) in some programs and thirty hours per week of class (inc. lab. time) in others 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 college regardless of whether subsistence checks have been received or not.

Dates for payments of costs cannot be waived because of delay in receiving benefits. Prospective veteran students may obtain applications for educational benefits from the Bookkeeper's Office at the College.

### **Financial Aid**

Financial aid at Salem Technical Vocational Community College is available in a variety of forms and scholarships.

### **SCHOOL DISTRICT 24J SCHOLARSHIP**

The School District has authorized a scholarship for graduates of the district high schools. The scholarship is awarded on the basis of scholastic ability, financial need, and citizenship. Information can be obtained at the college general office.

### **CLARK & GROFF ENGINEERS, INC., STUDENT LOAN PROGRAM**

A loan of up to \$100 per month will be made available to students while maintaining satisfactory grades in their second year of Civil-Highway Engineering Technology program. Candidates for this loan are selected by a committee of three members on the basis of need, and probability of achievement in the field of Civil or Highway Engineering Technology. Requirements for application are that the student has an accumulative grade point average of at least 2.5 for the first year and a G.P.A. of at least 2.5 in the third term. Parents or guardians of minors will be required to co-sign any note.

### **Evening Program**

The evening classes at Salem Tech consist of both full and part time students, persons just out of high school and employed workers who have been out of school for some time. The evening student may elect to take up an entirely new occupation, or enroll in a Math or Science class for refresher purposes.

The requirements for entrance into the evening program are that the individual be 16 years of age or over and be capable of profiting from the instruction. Tuition for the classes will vary depending on the number and type of courses. Generally the cost is \$9.00 per term unit.

The classes normally are held between the hours of 6 p.m. and 11 p.m.

Further information on the evening program such as cost, time, and availability of various classes can be obtained by

calling or writing Salem Tech, 4389 Satter Drive N.E., Salem, Oregon 97303. Phone 585-6166, Extension 341. Evenings 585-6176.

### **Part Time Extension**

#### **OCCUPATIONAL EXTENSION**

The Occupational Extension classes are offered by Salem Tech to interested persons who are already experienced in a trade or craft. The classes are planned so that the participants may increase their performance skills and related technical information in order that they may become more valuable employees.

Classes may be arranged for any interested group of 10 or more individuals in most industrial occupations, skilled or semi-skilled trade or craft, and in any service or business occupation. Some examples of classes which have been conducted in the past are: Firemen Training; Oil Burner Service; Welding; Inside and Outside Wiring; Supervisory training; and specialized courses for the food processing industry.

The cost of these classes will vary depending on the circumstances.

#### **HOME ECONOMICS ADULT EDUCATION COURSES**

Home Economics courses for adults are planned for women and men of all ages and interests, in the Salem area. These non-college credit courses attempt to meet the needs of those who are combining wage-earning with homemaking responsibilities as well as those of retired status.

Certified, well-qualified instructors make it possible to offer a wide variety of Home Economics courses centered toward preparation for better home and family living and as an aid to wage-earning.

The minimum age for enrollment in all Home Economics Adult courses is 16 years. High School Students may enroll for credit when authorized by their high school principal. Each will be required to complete the work satisfactorily according to requirements of the instructor.

#### **FIREMEN TRAINING**

This program consists of a series of courses designed to fill the need for technical instruction of volunteer and full-time firemen. The courses may be offered in the local fire station or the college. Instructors are selected on the basis of their experience and special competence in the subjects being taught. The interested individual or group may elect to follow several courses of action depending upon their needs, with an ultimate goal of an Associate Degree in Fire Protection Technology.

## INDUSTRIAL SUPERVISORY PROGRAM

This program is a planned series of courses in Supervisory Methods and Techniques. The courses are available to individuals who are currently involved in supervisory duties or personnel who will assume supervisory duties eventually.

## CONTEMPORARY CORRECTIONS PROGRAM

A program designed to serve the needs of those persons who are employed in the corrections field, and as a preparation for those wishing to enter corrections work.

## REAL ESTATE PROGRAM

An evening program designed to serve the needs of persons who are already employed in the field of real estate and who wish to increase their effectiveness in the profession.

### Special Programs

On occasion, agencies on the federal, state or local level will have cooperative training or retraining programs in session at the college.

## FEDERAL MANPOWER DEVELOPMENT AND TRAINING ACT PROGRAMS

Certain programs are offered in conjunction with the Employment Service of Oregon through the Federal Manpower Training Act. Under the Act, the Employment Service makes the initial selection of the individuals for training in the programs.

For additional information concerning the college, the programs or the courses offered, Telephone, Write or Visit

### SALEM TECHNICAL VOCATIONAL COMMUNITY COLLEGE

4389 Satter Drive NE, Salem, Oregon  
Telephone 585-6166, Ext. 341; Evenings 585-6176

# Data Processing Technology

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

This is a two year program providing for specialization in the second year. The first year of the program provides for common business data processing training. The second year has two options: Electric Accounting Machines and Electronic Data Processing. The second year options provide for concentrated study and skill development in these specific fields. Selection of the second year option is based on testing and individual counseling of each student.

Students receive a thorough grounding in accounting, business data processing, computer programming, and management procedures. Comprehensive instruction in logic principles and actual operation of tabulating machines, collators, sorters, interpreters, key punch, reproducing punch and electronic computer is provided.

Upon satisfactory completion of the requirements in the Data Processing Program, an Associate in 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 here:

Coders	EDP Clerk and Librarian
EDPM Programmer Trainee (CS)	EDPM Programmer 1 (CS)
Machine Operator—Peripheral	Machine Operators—Computer
Tabulating Machine Operator 1 (CS)	Procedures Writer
Systems and Procedures Trainee	

Associate in Science Degree:

Electronic Accounting Machine: Required 98 Term Units

Electronic Data Processing: Required 103 Term Units

# Data Processing Curriculum

## First Year

### Term 1

Hours Class	Work Lab.	Course Title	Course No.	Term Units
3	3	Accounting .....	6.920	4
3		Communication Skills .....	1.101	3
3		Introduction to Business and Public Administration .....	2.502	3
3	3	Introduction to Electric Accounting Machines .....	6.913	4
2	2	Mathematics .....	4.202	3

### Term 2

3	3	Accounting .....	6.921	4
3		Communication Skills .....	1.104	3
2	6	Electric Accounting Machines, Logic Principles .....	6.940	4
2	2	Mathematics .....	4.204	3
3		General Education Elective .....		3

### Term 3

3	3	Accounting .....	6.922	4
3		Technical Report Writing .....	6.126	3
3		Business Statistics .....	6.912	3
3		Data Processing Mathematics .....	6.925	3
3	3	Programming .....	6.935	4

# Data Processing Curriculum

## Second Year Options Electric Accounting Machines Curriculum

### Term 4

Hours Class	Work Lab.	Course Title	Course No.	Term Units
3	2	Introduction to Electronic Accounting Machine Applications .....	6.944	4
3		Introduction to Systems and Procedures .....	6.902	3
2	6	Introduction to Electric Accounting Machine Operations .....	6.941	4
3		Cost Accounting .....	2.576	3
3		Introduction to Psychology .....	1.606	3

### Term 5

3	3	Intermediate Electric Accounting Machine Applications .....	6.945	4
3		Automated Systems and Procedures .....	6.904	3
2	6	Intermediate Electric Accounting Machine Operations .....	6.942	4
3		Business Economics .....	1.524	3

### Term 6

3	3	Advanced Electronic Accounting Machine Applications .....	6.946	4
3		Business Management .....	6.908	3
2	6	Advanced Electric Accounting Machine Operations .....	6.943	4
2		Electric Systems Management .....	6.947	2
3		General Education Elective .....		3

## Electronic Data Processing Curriculum

### Term 4

2	3	Electronic Data Processing Machine Operations .....	6.909	3
3		Introduction to Systems and Procedures .....	6.902	3
3	6	Programming .....	6.936	4
3		Cost Accounting .....	2.576	3
3		Data Processing Mathematics .....	6.926	3
3		Introduction to Psychology .....	1.606	3

### Term 5

3	3	Electronic Data Processing Applications .....	6.949	4
3		Automated Systems and Procedures .....	6.904	3
3	6	Programming .....	6.937	4
3		Business Economics .....	1.524	3
3		Data Processing Mathematics .....	6.927	3

### Term 6

3	3	Electronic Data Processing Applications .....	6.950	4
3	6	Programming .....	6.938	4
3		Business Management .....	6.908	3
2		Electronic Systems Management .....	6.948	2
3		General Education Elective .....		3

## Real Estate Technology

This curriculum is designed to provide depth of understanding in the requirements of the occupations in and associated with the real estate industry.

Real Estate Appraisal, Property Management, Real Estate Finance, Title and Escrow, Sales and Brokerage are among the many various fields of interest considered in this curriculum.

The two year program in Real Estate will present, in broad scope, the information essential for satisfactory performance in these occupational areas.

An evening program is also provided, presenting courses which will be of value to persons presently employed in real estate occupations and who wish to enhance their professional ability by continued study. The instructors for these courses are selected for their prominence in the various specialized areas of real estate.

Upon satisfactory completion of the requirements of the Real Estate Technology Program, an Associate in Science Degree will be awarded.

Associate in Science Degree: Required 103 Term Units

# Real Estate Curriculum

## First Year

### Term 1

Hours Class	Work Lab.	Course Title	Course No.	Term Units
3		Introduction to Psychology .....	1.606	3
3	3	Accounting .....	6.920	4
1	4	Typing .....	2.606	2
3		Business Mathematics .....	6.918	3
3		Communication Skills .....	1.101	3
1	3	Business Machines .....	2.660	2

### Term 2

3		Business Mathematics .....	6.923	3
3		Communication Skills .....	1.104	3
3		Real Estate Principles .....	2.400	3
3		Business Law .....	2.320	3
3	3	Accounting .....	6.921	4
3		General Education Elective .....		3

### Term 3

3		Real Estate Principles .....	2.410	3
3		Real Estate Finance .....	2.406	3
3		Real Estate Law .....	2.402	3
2	2	Public Speaking .....	1.610	3
3		Business Economics .....	1.524	3
3	3	Accounting .....	6.921	4

## Second Year

### Term 4

1	4	Real Estate Salesmanship .....	2.415	3
2	3	Real Estate Practices .....	2.404	3
3		Real Estate Trends and Developments .....	2.412	3
1	4	Elements of Design and Construction .....	2.418	3
3		Fundamentals of Real Estate Taxation .....	2.416	3

### Term 5

2		Subdividing and Community Planning .....	2.438	2
2	3	Real Estate Appraisal .....	2.408	3
2	3	Real Estate Sales Promotion .....	2.420	3
1	3	Property Management .....	2.422	2
3		Fundamentals of Exchanging .....	2.417	3

### Term 6

2	3	Real Estate Appraisal .....	2.409	3
3	2	Commercial and Investment Properties .....	2.419	4
2	8	Real Estate Work Experience .....	2.431	6
5		Real Estate Counseling .....	2.440	5
2		Construction Estimating .....	6.110	2

# Civil and Structural Engineering Technology

The first year (initial three terms) of the following curricula are common:

- Civil and Structural Engineering Technology
- Highway Engineering Technology
- Civil-Structural Drafting Technology
- Surveyor Technician Program

The student will make a choice of a major technology at the end of the first year.

The objective of the Civil and Structural Program is to prepare students to meet the requirements for entrance into various branches of employment in Civil and Structural Engineering fields 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 in 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:

Construction Foreman  
Assistant Engineer  
Senior Draftsman  
Surveyor  
Civil Engineering Technician  
Structural Designer  
Supt. of Construction

Inspector  
Construction Estimator  
Cost Estimator  
Contractor's Assistant  
Technical Writer  
Computer  
Engineering Aide  
Instrument Man, Survey

Associate in Science Degree: Required 105 Term Units.

# Civil and Structural Engineering Technician Curriculum

## First Year

### Term 1

Hours	Work	Course Title	Course No.	Term
Class	Lab.			Units
3	2	Applied Physics .....	6.370	4
2	6	Plane Surveying .....	6.101	4
	4	Drafting .....	4.101	2
3		Technical Mathematics .....	6.261	3
	2	Slide Rule Operations .....	6.137	1
3		Communication Skills .....	1.101	3

### Term 2

	2	Engineering Problems .....	6.138	1
3	2	Applied Physics .....	6.371	4
3		Communication Skills .....	1.104	3
	4	Drafting .....	4.105	2
2	6	Plane Surveying .....	6.103	4
3		Technical Mathematics .....	6.262	3

### Term 3

1	2	Practical Descriptive Geometry .....	6.127	2
2	3	Applied Mechanics .....	6.109	3
1	6	Surveying Computations .....	6.500	3
2	3	Strength of Materials .....	6.105	3
3		Technical Mathematics .....	6.266	3
3		Technical Report Writing .....	6.126	3
* 2	3	Properties of Materials .....	6.341	3

## Second Year

### Term 4

1	5	Land Division and Mapping .....	6.355	3
2	3	Strength of Materials .....	6.128	3
2	3	Applied Mechanics .....	6.111	3
1	3	Earthwork Computations and Estimates .....	6.528	2
1	6	Route Surveying .....	6.507	3
3		Introduction to Psychology .....	1.606	3

### Term 5

2	2	Hydraulics .....	6.112	3
3		Contracts and Specifications .....	6.118	3
1	3	Structural Analysis and Design .....	6.130	2
3	3	Timber and Steel Construction .....	6.125	4
3	3	Fortran Computer Programming .....	6.931	4
3		General Education Elective .....		3

### Term 6

2	5	Concrete Construction and Design .....	6.123	4
	4	Structural Drafting .....	4.111	2
2	2	Hydraulics .....	6.114	3
2	3	Soil Mechanics .....	6.124	3
2		Construction Estimating .....	6.110	2
3		General Education Elective .....		3

\*May be taken by surveyor majors in lieu of Strength of Materials.

# Highway Engineering Technician

\*(Optional upon the completion of the first year Civil Program)

The graduates of 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.

Upon satisfactory completion of the requirements in the Highway Engineering Technology Program, an Associate in 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:

Junior Construction Inspector	Construction Inspector
Map Draftsman	Soils Technician
Supervising Technician	Materials Lab Technician
Estimator	Land Surveyor
Instrumentman	Construction Surveyor
Engineering Office Technician	Highway Draftsman

Associate in Science Degree: Required 105 Term Units.

# Highway Engineering Technician Curriculum

## Second Year

### Term 4

Hours Class	Work Lab.	Course Title	Course No.	Term Units
1	5	Mapping and Computing .....	6.350	3
2	3	Strength of Materials .....	6.128	3
1	3	Earthwork Computation and Estimates .....	6.528	2
1	6	Route Surveying .....	6.507	3
3		Introduction to Psychology .....	1.606	3
2	3	Applied Mechanics .....	6.111	3

### Term 5

2	2	Hydraulics .....	6.112	3
1	5	Mapping and Computing .....	6.351	3
3		Contracts and Specifications .....	6.118	3
2	2	Concrete Practice .....	6.555	3
2	2	Data Processing Applications .....	6.930	3
3		General Education Elective .....		3

### Term 6

3		Traffic Engineering .....	6.553	3
2	3	Soil Mechanics .....	6.124	3
2	2	Asphalt Paving .....	6.551	3
3		Practical Hydrology .....	6.535	3
2	6	Highway Design .....	6.554	4
3		General Education Elective .....		3

## Civil and Structural Drafting Technician

\*(Optional upon the completion of the first year Civil program)

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 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.

Upon satisfactory completion of the requirements in the Civil and Structural Drafting Program an Associate in 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 Drafting Technology.

Associate in Science Degree: Required 101 Term Units.

# Civil and Structural Drafting Technician Curriculum

## Second Year

### Term 4

Hours Class	Work Lab.	Course Title	Course No.	Term Units
3		Introduction to Psychology .....	1.606	3
3		Introduction to Specifications .....	4.102	3
	8	Architectural Drafting .....	4.226	3
1	5	Mapping and Computing .....	6.350	3
1	6	Route Surveying .....	6.507	3
1	3	Earthwork Computation and Estimates .....	6.528	2

### Term 5

2	6	Industrial Construction Drafting .....	4.133	4
1	5	Mapping and Computing .....	6.351	3
3	3	Timber and Steel Construction .....	6.125	4
	8	Architectural Drafting .....	4.227	3
3		General Education Elective .....		3

### Term 6

2	6	Industrial Construction Drafting .....	4.137	4
	4	Structural Drafting .....	4.111	2
3	4	Photo Interpretation and Mapping .....	4.112	4
	8	Technical Illustration .....	4.228	3
3		General Education Elective .....		3

# Surveyor Technician Program

\*(Optional upon the completion of the first year Civil program)

The objective of this program is to develop the capabilities of the student in the basic concepts and the rules associated with surveying and inspection. The student upon graduating from this sequence of courses will be sufficiently founded in technical material to start work as a surveyor technician doing location work for roads or highways, building location, property surveys, office computations, and map preparation. An affiliated field of work is the construction inspector who represents the engineer on the job site and inspects the construction work as it progresses to assure compliance with the plans and specifications.

The training is wide enough in scope so the student can use the program as a base for further study in Surveying and general Civil Engineering. Together with further study and sufficient experience, the student will have an opportunity to become a registered surveyor or to advance to a civil engineering rating if employed by certain federal, state or city organizations.

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

Examples of opportunities are listed here:

Surveyor Aide	Cartographer Technician
Surveyor	Construction Estimator
Inspector	Contractor's Assistant
Engineering Aide	Computer
Construction Accountant	

Associate in Science Degree: Required 103 Term Units.

# Surveyor Technician Curriculum

## Second Year

### Term 4

Hours Class	Work Lab.	Course Title	Course No.	Term Units
1	5	Mapping and Computing .....	6.350	3
1	3	Earthwork Computation and Estimates .....	6.528	2
1	6	Route Surveying .....	6.507	3
1	2	Blueprint Reading for Construction .....	4.859	2
1	2	Asphalt and Concrete Practice .....	6.556	2
3		Introduction to Psychology .....	1.606	3

### Term 5

1	5	Mapping and Computing .....	6.351	3
2	2	Hydraulics .....	6.112	3
3		Industrial Safety .....	4.108	3
2	2	Data Processing Applications .....	6.930	3
3		Contracts and Specifications .....	6.118	3
3		General Education Elective .....		3

### Term 6

1	5	Mapping and Computing .....	6.352	3
2	2	Geodetic Surveying .....	6.343	3
3	4	Photo Interpretation and Mapping .....	4.112	4
2	3	Engineering Soil Testing .....	6.344	3
2	4	Construction and Special Surveys .....	6.342	3
3		General Education Elective .....		3

# Electronic Engineering Technology

The first year (initial three terms) of the following curricula are common:

- Electronic Engineering Technician
- Industrial Electronic and Communication Technician
- Electronic-Electrical Drafting Technician

The student will make a choice of a major technology at the end of the first 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-conductor 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.

Graduate Electronic Technicians employed in research and development activities usually assist physical scientists or engineers in designing, testing, and modifying experimental electronic devices. They may be called upon to devise practical solutions of 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 in 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.)	Electronic Computer Technician
Radio Operator and Dispatcher	Microwave Radio Technician
Electronics Technician	Electronic Instrument Service Technician
Laboratory Technician (Electronic)	Industrial Electronic Technician Supervisor
Electronic Instrument Technician (Mfg.)	Electronic Equipment Designer
Guided Missile Technician	Electronic Engineering Technician

Associate in Science Degree: Required 106 Term Units.

# Electronic Engineering Technician Curriculum

## First Year

### Term 1

Hours Class	Work Lab.	Course Title	Course No.	Term Units
3	2	Electrical Theory DC .....	6.200	4
	2	Slide Rule Operations .....	6.137	1
3		Technical Mathematics .....	6.261	3
3	2	Applied Physics .....	6.370	4
	3	Drafting .....	4.101	2
3		Communication Skills .....	1.101	3

### Term 2

3	2	Electrical Theory AC .....	6.202	4
	2	Engineering Problems .....	6.138	1
3		Technical Mathematics .....	6.262	3
3	2	Applied Physics .....	6.371	4
3	3	Vacuum Tube and Transistor Analysis .....	6.223	4
3		Communication Skills .....	1.104	3

### Term 3

3	3	Electrical Circuits .....	6.206	4
3	6	Amplifier Circuits and Design .....	6.217	5
3		Technical Report Writing .....	6.126	3
3		Technical Mathematics .....	6.266	3
3	2	Introductory Chemistry .....	6.275	4

## Second Year

### Term 4

3		Electrical Mathematics .....	6.115	3
2	6	Oscillators Circuits and Design .....	6.225	4
2	3	Wave Generation and Shaping .....	6.234	3
2	3	Semiconductors .....	6.237	3
2		Network Analysis .....	6.230	2

### Term 5

	4	Electronic Drafting .....	4.103	2
3	3	Industrial Electronics .....	6.218	4
3	3	Industrial Television .....	6.228	4
3		Electronic Data Processing .....	6.240	3
2		Antennas and Transmission Lines .....	6.231	2
3		General Education Elective .....		3

### Term 6

2	3	Advanced Electronic Circuits .....	6.216	3
3		Electronic Instruments .....	6.220	3
3	6	Industrial Television .....	6.235	5
3	3	Advanced Industrial Electronics .....	6.248	4
2	3	Microwaves .....	6.242	3

# Industrial Electronic and Communication Technician Program

\*(Optional upon completion of the first year Electronic Engineering Technician Curriculum)

The objective of the Industrial Electronic and Communication Technician Program is to prepare individuals for entrance into the field of industrial instrument processes or into the field of mobile communication work. The courses are designed to build a background knowledge of these fields. A heavy emphasis is placed upon practical theory and application allowing the student to become familiar with the usage of the equipment for the purpose of testing and servicing. The technician in this field should have a good background in manual skill, also technical judgment based on mathematics and scientific principles with a proficiency of materials and processes in his specialized field and a knowledge of organization and communication skills.

For satisfactory completion of this program a minimum of a second class radio-telephone license is required. Upon satisfactory completion of the requirements in the Industrial Electronic and Communication Technician Program, an Associate in Science Degree will be awarded, signifying that the student is prepared to effectively function and advance in the many job areas of the industrial electronic and communication technician field.

Examples of job opportunities are listed below:

Mobile Radio Technician	Instrument Test and Calibration Technician
Microwave Technician	Laboratory Technician
Microwave Installer	
Industrial Instrumentation Technician	

Associate in Science Degree: Required 104 Term Units.

# Industrial Electronic and Communication Technician Curriculum

## Second Year

### Term 4

Hours Class	Work Lab.	Course Title	Course No.	Term Units
2	3	Wave Generation and Shaping .....	6.234	3
2	3	Semiconductors .....	6.237	3
2		Network Analysis .....	6.230	2
3	3	Radio Transmitters .....	6.250	4
3		Introduction to Psychology .....	1.606	3

### Term 5

3	3	Industrial Electronics .....	6.218	4
2	3	Industrial Television .....	6.228	3
2		Antennas and Transmission Lines .....	6.231	2
2	3	Industrial Instrumentation .....	6.253	3
2	3	Communication Receivers .....	6.251	3
3		General Education Elective .....		3

### Term 6

2	3	Microwaves .....	6.242	3
2		Radio Law .....	6.252	2
2	3	Industrial Instrumentation .....	6.254	3
3		Business Management .....	2.202	3
3	3	Advanced Industrial Electronics .....	6.248	4

# Electronic-Electrical Drafting Technician

\*(Optional upon completion of first year Electronic Engineering Technician Curriculum)

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.

Upon satisfactory completion of the requirements in the Electronic-Electrical Drafting Program, an Associate in 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 Drafting 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 Science Degree: Required 100 Term Units.

# Electronic-Electrical Drafting Technician Curriculum

## Second Year

### Term 4

Hours Class	Work Lab.	Course Title	Course No.	Term Units
3		Introduction to Specifications .....	4.102	3
3		Introduction to Psychology .....	1.606	3
3		Industrial Safety .....	4.108	3
2	6	Introduction to Fabrication Practices .....	4.100	4
3		Electronic-Electrical Standards .....	4.114	3
	6	Scales and Graphs .....	4.139	2

### Term 5

3	2	Production Planning and Practices .....	4.104	4
	4	Electronic Drafting .....	4.103	2
1	6	Control Layout Systems .....	4.143	3
2	6	Cost Computations .....	4.142	4
2		Health Education .....	1.605	2
3		General Education Elective .....		3

### Term 6

	4	Technical Illustration .....	4.127	2
1	8	Project Drafting .....	4.145	4
	6	Light Sheet Metal Drafting .....	4.147	2
	3	Pictorial Drafting .....	4.149	1
3		General Education Elective .....		3

# Mechanical Engineering Technology

This curriculum is designed to provide depths 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.

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.

Graduating 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.

Upon satisfactory completion of the requirements in the Mechanical Engineering Technology Program, an Associate in 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 opportunities are listed here:

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

Associate in Science Degree: Required 104 Term Units

# Mechanical Engineering Technician Curriculum

## First Year

### Term 1

Hours Class	Work Lab.	Course Title	Course No.	Term Units
	2	Slide Rule Operations .....	6.137	1
3		Technical Mathematics .....	6.261	3
3	2	Applied Physics .....	6.370	4
	4	Drafting .....	4.101	2
3		Communication Skills .....	1.101	3
1	3	Welding .....	4.150	2
3	2	Introduction to Chemistry .....	6.275	4

### Term 2

2	3	Metallurgy .....	6.602	3
2	3	Manufacturing Processes .....	6.606	3
	2	Engineering Problems .....	6.138	1
3		Technical Mathematics .....	6.262	3
3	2	Applied Physics .....	6.371	4
	4	Drafting .....	4.105	2
3		Communication Skills .....	1.104	3

### Term 3

2	3	Manufacturing Processes .....	6.610	3
2	3	Strength of Materials .....	6.105	3
1	2	Practical Descriptive Geometry .....	6.127	2
3		Technical Mathematics .....	6.266	3
3		Technical Report Writing .....	6.126	3
2	3	Applied Mechanics .....	6.109	3

## Second Year

### Term 4

3	3	Mechanisms .....	6.612	4
3	2	Electricity .....	6.208	4
3		Introduction to Psychology .....	1.606	3
2	3	Applied Mechanics .....	6.111	3
2	3	Strength of Materials .....	6.128	3

### Term 5

2	2	Hydraulics .....	6.112	3
2	3	Industrial Instrumentation .....	6.253	3
3	2	Machine Design .....	4.603	4
2	3	Applied Thermodynamics .....	6.615	3
3		General Education Elective .....		3

### Term 6

2	2	Applied Fluid Power .....	6.117	3
2	6	Design Problems .....	4.605	4
2	3	Industrial Instrumentation .....	6.254	3
2	3	Applied Heat Power .....	6.616	3
3		General Education Elective .....		3

# Industrial-Mechanical Technician Program

The courses in this program are designed to provide the basic knowledge, skills and information needed by persons preparing to enter the industrial mechanical field of employment.

This is a two-year program providing for specialization in the second year. The first year of the program provides for common industrial mechanical training which applies in several fields. After successful completion of the common first year the student may elect to continue in one of the options which will be offered.

Second year options provide for concentrated study and skill development in these specific fields.

Upon satisfactory completion of the requirements in the Industrial-Mechanical Technician Program, an Associate in Science Degree will be awarded.

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

Associate in Science Degree: Required Term Units:  
Machine Shop Option 103, Drafting Option 105  
Welding and Fabrication Option 98

## First Year

### Term 1

Hours Class	Work Lab.	Course Title	Course No.	Term Units
2	2	Mathematics .....	4.200	3
3		Communication Skills .....	1.101	3
3		Introduction to Psychology .....	1.606	3
	4	Drafting .....	4.101	2
2	4	Bench and Layout Practices .....	4.810	3
2	3	Machine Tool Processes .....	4.802	3

### Term 2

2	2	Mathematics .....	4.202	3
3		Communication Skills .....	1.104	3
	1	Shop Safety .....	4.253	1
3	2	Practical Physics .....	4.300	4
	4	Drafting .....	4.105	2
2	3	Machine Tool Processes .....	4.804	3
3		General Education Elective .....		3

### Term 3

2	2	Mathematics .....	4.204	3
2	4	Industrial Material and Processes .....	4.170	3
1	3	Welding .....	4.150	2
2	3	Machine Tool Processes .....	4.806	3
3	2	Practical Physics .....	4.302	4
3		General Education Elective .....		3

# Industrial-Mechanical Second Year Options

## MACHINE SHOP

### Term 4

Hours Class	Work Lab.	Course Title	Course No.	Term Units
3	3	Mechanical Systems .....	4.171	4
3	4	Power Systems .....	4.172	4
3		Machine Shop Problems .....	4.820	3
3	6	Machine Shop Practices .....	4.841	5

### Term 5

2	3	Hydraulic and Pneumatic Systems .....	4.173	3
2	4	Metal Fabrication and Finishing .....	4.174	3
2	4	Advanced Lathe Practices .....	4.833	3
2	4	Advanced Milling Machine Practices .....	4.837	3
3		General Education Elective .....		3

### Term 6

2		Machine Shop Automation .....	4.824	2
3	12	Job Machining Practices .....	4.845	7
2	4	Tool and Fixture Design and Application .....	4.847	3
3		Employer-Employee Relations .....	4.500	3
3		General Education Elective .....		3

## WELDING AND FABRICATION

### Term 4

3	3	Mechanical Systems .....	4.171	4
3	4	Power Systems .....	4.172	4
2	3	Blueprint Reading and Sketching .....	4.244	3
1	3	Electric-Arc Welding .....	4.160	2
1	3	Oxygen-Acetylene Welding .....	4.161	2

### Term 5

2	3	Hydraulic and Pneumatic Systems .....	4.173	3
2	4	Metal Fabrication and Finishing .....	4.174	3
2	6	Electric-Arc Welding .....	4.162	4
2	3	Metallurgy .....	6.602	3
3		General Education Elective .....		3

### Term 6

1	3	Tungsten inert Gas Welding .....	4.247	2
1	3	Metallic Inert Gas Welding .....	4.248	2
2	6	Welding for Certification .....	4.166	4
2	2	Welding for Production and Economy .....	4.165	3
	4	Fabrication Problems .....	4.167	2
3		General Education Elective .....		3

## MECHANICAL DRAFTING

### Term 3

Hours Class	Work Lab.	Course Title	Course No.	Term Units
1	2	Practical Descriptive Geometry .....	6.127	2

### Second Year

### Term 4

	2	Slide Rule Operations .....	6.137	1
3		Technical Mathematics .....	6.261	3
3	2	Applied Physics .....	6.370	4
	3	Sketching .....	4.118	1
1	1	Geometric Construction .....	4.120	1
	8	Cam and Gear Drafting .....	4.225	3
3	2	Electricity .....	6.208	4

### Term 5

	2	Engineering Problems .....	6.138	1
3		Technical Mathematics .....	6.262	3
1	9	Project Drafting .....	4.119	4
	8	Technical Illustration .....	4.228	3
3		Business Economics .....	1.524	3
	4	Electrical Drafting .....	4.103	2

### Term 6

3		Technical Report Writing .....	6.126	3
2		Machine Shop Automation .....	4.824	2
	8	Sheet Metal Drafting .....	4.230	3
	8	Jig and Fixture Drafting .....	4.231	3
	5	Technical Illustration .....	4.229	2
3		General Education Elective .....		3

## Well Drilling Technician

This is a preparation for an outdoor mechanical occupation. It is an option from a modified first year of the Industrial-Mechanical Technician Program.

The well drilling technician sets up and operates earth drilling machines. He hoists and positions tubular casing over the hole, lowers the drill stem into the casing, manipulates the drill, removes samples of subterrain, repairs and maintains the drilling and accessory equipment. He has a familiarity with geology, ground water location and quality, pumping and drilling techniques and equipment.

Job opportunity for the graduates of this option are found in the drilling industry in development for subterranean water resources, test holes, earth sampling, sales, installation and repair of pumping equipment, sales engineering for equipment manufacturers, inspection and quality control for state or regional ground water resources.

Associate in Science Degree: Required 107 Term units.

# Well Drilling Technician Curriculum

## First Year

### Term 1

Hours Class	Work Lab.	Course Title	Course No.	Term Units
2	2	Mathematics .....	4.200	3
3		Communication Skills .....	1.101	3
	4	Drafting .....	4.101	2
2	4	Bench and Layout Practices .....	4.821	3
2	3	Machine Tool Processes .....	4.802	3
3	4	Power Systems .....	4.172	4

### Term 2

2	2	Mathematics .....	4.202	3
3		Communication Skills .....	1.104	3
3	2	Practical Physics .....	4.302	4
2	3	Machine Tool Processes .....	4.804	3
2	3	Hydraulic and Pneumatic Systems .....	4.173	3
3		General Education Elective .....		3

### Term 3

2	4	Industrial Materials and Processes .....	4.170	3
1	3	Welding .....	4.150	2
2	3	Heat-Treatment of Steel .....	4.849	3
3	2	Drill Equipment, Tools and Terminology .....	4.290	4
2	4	Engine Theory and Maintenance .....	4.291	3

## Second Year

### Term 4

3		Introduction to Psychology .....	1.606	3
3	4	Mechanical Systems .....	4.171	4
3	4	Drilling Machine Maintenance and Repair .....	4.296	4
3	2	Elementary Geology .....	4.305	4
3		State Drilling Standards and Record Keeping .....	4.293	3

### Term 5

	1	Shop Safety .....	4.253	1
3		Business Economics .....	1.524	3
2	3	Intermediate Arc Welding .....	4.291	3
3	2	Hydraulics for Drillers .....	4.294	4
3		Finance, Contracts and the Law .....	2.340	3
2	2	Topographic Map Interpretation .....	4.130	3

### Term 6

2	6	Welding for Certification .....	4.166	4
3	4	Small Pump Installation .....	4.295	4
3	4	Drilling Setups and Operations .....	4.292	4
3		Special Drilling Problems .....	4.297	3
3		General Education Elective .....		3

# Technical Drafting

The objective 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 tasks such as drawing preliminary sketches, making layouts from technical information, rendering drawings in pencil and ink, making overlays and paste ups and detailed 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 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

Associate in Science Degree: Required 97 Term Units.

# Drafting Technician Curriculum

## First Year

### Term 1

Hours Class	Work Lab.	Course Title	Course No.	Term Units
3		Communication Skills .....	1.101	3
3		Introduction to Psychology .....	1.606	3
3		Technical Mathematics .....	6.261	3
	2	Slide Rule Operations .....	6.137	1
1	6	Plane Surveying .....	6.101	4
	3	Sketching .....	4.118	1
1	1	Geometric Construction .....	4.120	1
	5	Machine Drafting .....	4.221	2

### Term 2

3		Communication Skills .....	1.104	3
3		Technical Mathematics .....	6.262	3
2	6	Plane Surveying .....	6.103	4
2	3	Manufacturing Processes .....	6.606	3
	2	Engineering Problems .....	6.138	1
2		Dimensioning and Layout .....	4.224	2
	5	Machine Drafting .....	4.222	2

### Term 3

3		Psychology of Human Relations .....	1.608	3
3		Technical Mathematics .....	6.266	3
2	3	Manufacturing Processes .....	6.610	3
1	7	Mapping and Platting .....	4.131	3
1	2	Practical Descriptive Geometry .....	6.127	2
	5	Machine Drafting .....	4.223	2

## Second Year

### Term 4

3	2	Applied Physics .....	6.370	4
	8	Architectural Drafting .....	4.226	3
	8	Cam and Gear Drafting .....	4.225	3
	4	Electrical Drafting .....	4.103	2
3		Introduction to Specifications .....	4.102	3

### Term 5

3	2	Applied Physics .....	6.371	4
	8	Architectural Drafting .....	4.227	3
	8	Technical Illustration .....	4.228	3
3		Business Economics .....	1.524	3
3		General Education Elective .....		3

### Term 6

3	2	Applied Physics .....	6.366	4
	8	Sheet Metal Drafting .....	4.230	3
	5	Technical Illustration .....	4.229	2
	4	Structural Drafting .....	4.111	2
	8	Jig and Fixture Drafting .....	4.231	3

# Forest Industries Technology

A program of studies designed to prepare persons for employment in skilled and technical occupations related to the wood-producing and wood-using industries. The program includes courses which provide the scientific knowledge and technical skills determined by industry to be necessary for successful employment in forestry occupations.

This is a two year program which provides for specialization in the second year. The first year of the program provides for common training which applies in several fields. After successful completion of the first year, the student may elect to continue in one of the options, or seek employment at the Forestry Aide level.

Students interested in either of the options will be assisted in finding summer employment in their field.

## Forest Industries Technician Curriculum

### First Year

#### Term 1

Hours Class	Work Lab.	Course Title	Course No.	Term Units
3		Communication Skills .....	1.101	3
	4	Drafting .....	4.101	2
3		General Forestry .....	3.600	3
2	2	Mathematics .....	4.202	3
2	6	Plane Surveying .....	6.101	4
	2	Slide Rule Operations .....	6.137	1
1	2	Tools and Equipment .....	3.605	2

#### Term 2

3		Communications Skills .....	1.104	3
	4	Drafting .....	4.105	2
2	2	Analysis (Mathematics) .....	4.207	3
2	6	Plane Surveying .....	6.103	4
1	2	Tree Identification .....	3.610	2
3	3	Forest Products .....	4.280	4

#### Term 3

3		Technical Report Writing .....	6.126	3
3	4	Forest Mensuration .....	6.300	4
1	2	Tree Identification .....	3.611	2
	2	Accident Prevention and First Aid .....	4.190	1
1	6	Quality Control in Wood Products .....	6.285	3
1	5	Forest Photogrammetry .....	3.624	3

# Forest Products Technician Curriculum

The objectives of the Forest Products Technician Program are to qualify technicians for employment in a variety of forest product manufacturing operations and to prepare them for responsible positions in Oregon's largest industry.

Job opportunities are available for the qualified graduate in plant operations, research and development, quality control, and sales.

Upon satisfactory completion of the requirements of the Forest Products Technician Curriculum, an Associate in Science Degree will be awarded.

Associate in Science Degree: Required 112 Term Units.

## Forest Products Technician Curriculum

### Second Year

#### Term 4

Hours Class	Work Lab.	Course Title	Course No.	Term Units
3	3	Forest Products .....	4.281	4
1	6	Quality Control in Wood Products .....	6.287	3
2	3	Wood Preservation and Finishing .....	6.282	3
3	2	Introductory Chemistry .....	6.275	4
3	2	Practical Physics .....	4.300	4
3		Introduction to Psychology .....	1.608	3

#### Term 5

3		Wood Industry Economics .....	4.286	3
1	6	Wood Structure and Identification .....	6.280	3
2	3	Elementary Wood Physics .....	6.281	3
3	2	Chemistry .....	6.276	4
3	2	Practical Physics .....	4.302	4
3		Psychology of Human Relations .....	1.608	3

#### Term 6

2	3	Wood Products Marketing .....	2.614	3
2	6	Logging and Milling .....	4.282	4
3		Methods of Supervision .....	4.287	3
3		Employer-Employee Relations .....	4.500	3
3		Consumer Economics .....	1.525	3
2	3	Elementary Wood Chemistry.....	6.279	3

# Forest Technician Curriculum

The Forest Technician Curriculum is designed to provide the student with the necessary knowledge and technical skills required for employment as a Forest Technician.

Job opportunities are available in the areas of log scaling, timber management, fire control, recreation, timber stand improvement, and as Forest Engineering Technicians.

Upon satisfactory completion of the requirements of the Forest Technician Curriculum, an Associate in Science Degree will be awarded.

Associate in Science Degree: Required 105 Term Units.

## Forest Technician Curriculum

### Second Year

#### Term 4

Hours Class	Work Lab.	Course Title	Course No.	Term Units
3	2	Natural Cover Fire Protection .....	5.151	4
1	6	Route Surveying .....	6.507	3
1	2	Tools and Equipment .....	3.606	2
	2	Forest Pathology .....	3.607	1
3	2	Practical Physics .....	4.300	4
3		Introduction to Psychology .....	1.606	3

#### Term 5

3		Wood Industry Economics .....	4.286	3
1	6	Wood Structure and Identification .....	6.280	3
2	6	Scaling Practices .....	3.617	4
3	2	Practical Physics .....	4.302	4
3		Psychology of Human Relations .....	1.608	3

#### Term 6

2	3	Wood Products Marketing .....	3.614	3
2	6	Logging and Milling .....	4.282	4
3		Methods of Supervision .....	4.287	3
3		Employer-Employee Relations .....	4.500	3
3		Consumer Economics .....	1.525	3
3		General Education Elective .....		3

# Fire Protection Technology

This curriculum will provide the student with a knowledge adequate to understand the significance and implications of those procedures to be performed at the entry level of the fire protection field he selects to pursue. He will gain sufficient skills to make a desirable employee for more than one field of fire protection.

The curriculum is designed to provide a broad base of technical and general subject matter. The instruction centers around elements that normally are not obtained through experience alone. Such background most certainly will enhance promotional and specialization opportunities.

Upon satisfactory completion of the requirements of the program, an Associate in Science Degree will be awarded, signifying that the student is prepared to effectively function and advance in an interesting, challenging and rewarding field offering a wide scope of employment opportunities. Employment opportunities for graduates are found in Municipal Fire Departments, Fire Equipment Sales Companies, Insurance Companies, Industrial Security Organizations and Forest Connected industries. The majority of opportunities are available in Municipal Fire Departments that have specific physical and social requirements. A prospective student interested in this field should check on these requirements before entrance into the program.

Certain core courses of the curriculum can be made available to presently employed Firefighters as In-Service Training to broaden their knowledge and increase their potential in the field.

Associate in Science Degree: Required 97 Term Units.

# Fire Protection Technician Curriculum

## First Year

### Term 1

Hours	Work	Course Title	Course No.	Term Units
Class	Lab.			
3		Introduction to Psychology .....	1.606	3
2	2	Mathematics .....	4.200	3
3		Communication Skills .....	1.101	3
3	2	Elementary Science for Firefighters .....	5.103	4
3		Introduction to Fire Protection .....	5.100	3

### Term 2

2	2	Mathematics .....	4.202	3
3		Communication Skills .....	1.104	3
3	2	Fire Science .....	6.995	4
2	2	Fire Apparatus and Equipment .....	5.102	3
3		Blueprint Reading for Firemen .....	5.119	3

### Term 3

3	2	Fire Science .....	6.996	4
3		Fundamentals of Fire Prevention .....	5.101	3
	9	Firefighting Skills .....	5.110	3
3		Hazardous Materials .....	5.108	3
3		General Education Elective .....		3

## Second Year

### Term 4

	9	Firefighting Skills .....	5.111	3
3		Hazardous Materials .....	5.109	3
2	2	Pump Operations and Practical Hydraulics .....	5.105	3
3	2	Fire Service Hydraulics .....	5.104	4
3	2	Natural Cover Fire Protection .....	5.151	4

### Term 5

3	2	Rescue and Emergency Care .....	5.120	4
3		Fire Department Organization and Management .....	5.112	3
3		Fire Protection Systems and Extinguishers .....	5.106	3
3		Firefighting Tactics and Strategy .....	5.113	3
3		General Education Elective .....		3

### Term 6

3		Technical Report Writing .....	6.126	3
3		Fire Department Communications and Alerting Systems .....	5.115	3
3		Water Distribution Systems .....	5.107	3
3	2	Fire Investigation .....	5.117	4
3		Building Construction for Fire Protection .....	5.116	3

# Television-Radio Service Program

The objective of this course is to prepare the students for employment in the field of radio and television servicing. The program is designed to provide the basic principles, theory and laboratory work in the practical phases of radio and television service work. Basic mathematics and communication skills necessary to the serviceman are given as part of the theory materials as they are needed.

Upon completion of the course each trainee should be able to take an entry job in the field of radio and television servicing, have had a good background in radio and television theory and maintenance and be familiar with both vacuum tube and transistor circuits. The trainee will also have a proficient knowledge in the use and application of test equipment.

The applicants must have a high school diploma or equivalent and be in good physical condition.

A Certificate of Completion is awarded to those individuals who have satisfactorily completed the required courses within the curriculum.

Examples of opportunities are listed below:

Radio-TV Serviceman	Sound System Maintenance Man
HiFi Serviceman	Factory Service Representative
Auto Radio Serviceman	Electronic Parts Salesman

## Television-Radio Service Curriculum

### Term 1

Hours Class	Work Lab.	Course Title	Course No.	Term Units
12		DC Theory and AC Theory .....	4.255	9
	6	DC Theory and AC Theory Lab. ....	4.256	2
6		Vacuum Tube and Circuits Theory .....	4.257	5
	6	Vacuum Tube and Circuits Theory Lab. ....	4.258	2

### Term 2

3	6	Transistors and Circuits Theory .....	4.259	5
2		Radio Principles .....	4.262	2
	6	Radio Principles Lab. ....	4.263	2
2		Use of Instruments I .....	4.260	2
3		Television Principles .....	4.266	3
	8	Television Principles Lab. ....	4.267	3

### Term 3

2		Radio Servicing .....	4.264	2
	6	Radio Servicing Lab. ....	4.265	2
3		Television Servicing .....	4.268	3
	8	Television Servicing Lab. ....	4.269	3
2		Use of Instruments II .....	4.261	2
3		FM and HiFi Theory .....	4.270	3
	3	FM and HiFi Theory Lab. ....	4.271	1
3		Business Management .....	2.202	3

# Welding Program

The courses in the welding program are designed to provide for skill development in the varied welding processes and to provide the necessary knowledge and information required in the welding occupations.

This is a one year program providing laboratory time for developing and practicing welding skills.

After satisfactory completion of the welding program the student is awarded a Certificate of Completion. An opportunity is provided for certification in arc welding by the Oregon State Bureau of Labor. An extra fee for this test is determined by the number of students involved and the type of test.

Job opportunities for the graduate of this program are found in job shops, specialty shops, production and maintenance shops.

Examples of job opportunities are listed below:

Oxygen Cutter	Oxy-acetylene Welder
Arc Cutter	Arc Welder
Welding Helper	Pipeline Welder

## Welding Curriculum

Term 1			Course No.	Term Units
Hours Class	Work Lab.	Course Title		
2	9	Basic Arc Welding .....	4.240	4
2	6	Basic Oxy-Acetylene Welding .....	4.242	4
2	3	Blueprint Reading and Sketching .....	4.244	3
2	2	✗ Shop Arithmetic .....	4.246	3
	2	✗ Shop Projects .....	4.250	1
Term 2				
2	12	Intermediate Arc Welding .....	4.241	5
	8	Intermediate Oxy-Acetylene Welding .....	4.243	2
2	3	Layout Practices .....	4.245	3
	1	✗ Shop Safety .....	4.253	1
	2	✗ Shop Projects .....	4.251	1
Term 3				
1	3	Tungsten Inert Gas Welding .....	4.247	2
1	3	Metallic Inert Gas Welding .....	4.248	2
2	6	Welding for Certification .....	4.166	4
3	9	✗ Weld Shop Problems .....	4.249	5
	2	✗ Shop Projects .....	4.252	1

# General Drafting Program

The objective of the General Drafting Program 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.

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:

General Drafting  
Machine Draftsman  
Tracer

## General Drafting Curriculum

Term 1				
Hours	Work	Course Title	Course No.	Term Units
Class	Lab.			
	4	Drafting .....	4.101	2
1	1	Geometric Construction .....	4.120	1
	3	Sketching .....	4.118	1
2	7	Introduction to Fabrication Practices .....	4.100	4
2	2	Mathematics .....	4.200	3
3		Communication Skills .....	1.101	3
Term 2				
	4	Drafting .....	4.105	2
	4	Electrical Drafting .....	4.103	2
1	9	Project Drafting .....	4.119	4
2	2	Mathematics .....	4.202	3
3		Communication Skills .....	1.104	3
1	7	Introduction to Mapping .....	4.132	3
Term 3				
	4	Mechanical Drafting .....	4.109	2
	8	Project Drafting .....	4.121	3
2	2	Mathematics .....	4.204	3
3	2	Practical Physics .....	4.302	4
	7	Architectural Drawing .....	4.107	3

## Office Occupations Program

The courses in this curriculum are designed to develop the skills and understanding that are necessary for entry employment into one of the office occupations.

A person entering this program may elect to study the subject matter relating to the work of the secretary or the stenographer. These courses are contained within the structure of the Clerk-Stenographer Curriculum.

Students interested in bookkeeping, typing, clerical, or other general office activities might elect the General Business Curriculum for studies relating to these general office positions.

The Certificate of Completion is awarded to those individuals who have satisfactorily completed the required courses within the curriculum.

# Office Occupations Curriculum

## CLERK-STENOGRAPHER

### Term 1

Hours Class	Work Lab.	Course Title	Course No.	Term Units
1	4	Typing .....	2.606	3
3		Communication Skills .....	1.101	3
3		Business Mathematics .....	2.650	3
3	4	Shorthand and Transcription .....	2.620	4
1	1	Personal Development .....	2.518	1
2	2	Records Management .....	2.642	3
3		Elective .....		3

### Term 2

1	4	Typing .....	2.607	3
1	3	Business Machines .....	2.660	2
3		Business English Fundamentals .....	2.673	3
3	4	Shorthand and Transcription .....	2.621	4
3		Secretarial Accounting .....	2.651	3
3		Elective .....		3

### Term 3

1	4	Typing .....	2.608	3
1	3	Business Machines .....	2.661	2
3		Business Correspondence .....	2.672	3
2	2	Office Procedures .....	2.622	3
2	3	Shorthand and Transcription .....	2.622	3
1	3	Applied Stenography .....	2.675	2

## GENERAL BUSINESS

### Term 1

1	4	Typing .....	2.606	3
3		Communication Skills .....	1.101	3
2	2	Records Management .....	2.642	3
3		Business Mathematics .....	2.650	3
3	3	Accounting .....	6.920	4
1	1	Personal Development .....	2.518	1
3		Elective .....		3

### Term 2

1	4	Typing .....	2.607	3
1	3	Business Machines .....	2.660	2
3		Business English Fundamentals .....	2.673	3
3	3	Accounting .....	6.921	4
6		Electives .....		6

### Term 3

1	4	Typing .....	2.608	3
1	3	Business Machines .....	2.661	2
3		Business Correspondence .....	2.672	3
2	2	Office Procedures .....	2.641	3
3		Psychology of Human Relations .....	1.608	3
3	3	Accounting .....	6.922	4

## Dental Assistant Program

The objective of this program is to prepare individuals for employment in dental offices, laboratories, and clinics, and also to provide opportunities to those already working in this field to further their knowledge and skill. The program is designed to provide training in the specialized skills necessary in dental chair assisting and in business practice ability.

The program is sufficiently comprehensive in nature so that the student acquires proficiency in assisting the dentist in a variety of capacities in the private office or in a dental health clinic. The program of study includes such activities as mixing of filling materials, instruments and their uses, preparation of patient, sterilization, and other general and specialized courses in dental science. Dental office management is an integral part of the program and includes instruction in areas such as reception of patients, office records, fees and other business practices.

Upon completion of the course of study, the graduate will be ably qualified to assist in a dental office or clinic with a minimum of familiarization and orientation from the dentist.

Typical duties will include preparation of the patients for treatment, mixing filling materials and dental cement, checking and sterilizing equipment, taking inventories and ordering supplies. Laboratory duties include studying models of teeth, casting inlays and taking and developing x-ray films. In the capacity of office manager she acts as receptionist, schedules appointments, keeps accounts and records, sends out bills and is responsible for the general appearance of the office.

Applicants for the dental assistant program must be a minimum of 16 years of age, and be a graduate of an accredited high school or the equivalent. The assistant should be neat, clean, and in good health. A pleasant personality is essential in dealing with dentist's patients. She should be able to meet people and put them at ease and be able to express herself clearly and pleasantly.

# Dental Assistant Curriculum

## Term 1

Hours Class	Work Lab.	Course Title	Course No.	Term Units
2	3	Introduction and Basic Procedures .....	5.411	3
3		Dental Anatomy and Physiology .....	5.405	3
3		Communication Skills .....	1.101	3
3		Introduction to Psychology .....	1.606	3
1	4	Typing .....	2.633	3
3		Business Mathematics .....	2.650	3

## Term 2

2	3	Chairside Assisting and Basic Laboratory Procedures .....	5.403	3
1	2	Roentgenology .....	5.406	2
3		Dental Sciences .....	5.404	3
1	2	Nutrition for Health Occupations .....	5.430	2
3		Communication Skills .....	1.104	3
1	4	Typing .....	2.634	3
2	3	Dental Office Management .....	5.410	3

## Term 3

2	3	Advanced Laboratory and Chairside Procedures .....	5.407	3
2	3	Roentgenology .....	5.408	3
3		Dental Office Correspondence .....	5.412	3
	12	Dental Office Practice .....	5.409	2
3		General Education Elective .....		3

## Medical Assistant Program

A Medical Assistant is a person trained to assist the licensed physician in his office. There is a steady demand for young women in this field performing in various types of medical offices. The range of duties will be from assisting with the physical examination, to receptionist and office responsibilities. Each office will differ in its requirements.

The objectives of the Medical Assistant Program are to develop understanding for the professional nature of the physician's practice and a respect for human dignity and rights of those who seek his service, and to develop the skills needed to function safely and effectively as a health team member in three principal areas of work assignment: the reception of patients, understanding business practices and medical record keeping, and the technical aspects of assisting with medical procedures.

The one year curriculum includes general education subjects, orientation to the health occupations, basic sciences, and technically oriented courses in medical and office procedures. The third term makes provisions for supervised clinical experience in clinics, physicians' offices and selected areas of the hospitals, nurses, medical assistants and teachers of commercial and general education subjects will constitute the faculty and Advisory Committee.

Applicants for the Medical Assistant Program 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 and have suitable personal traits and character.

A Certificate of Completion will be given upon satisfactory completion of the program. After a suitable period of successful employment the American Association of Medical Assistants certifies graduates by examination.

# Medical Assistant Curriculum

## Term 1

Hours Class	Work Lab.	Course Title	Course No.	Term Units
3		Introduction to Medical Assisting .....	5.600	3
3		Communication Skills .....	1.101	3
3		Introduction to Psychology .....	1.606	3
3		Business Mathematics .....	2.650	3
1	4	Typing .....	2.633	3
3	3	Basic Sciences for Health Occupations .....	5.601	4

## Term 2

2	6	Medical Assisting, Basic Procedures .....	5.602	4
3		Communication Skills .....	1.104	3
2	3	Medical Office Procedures .....	5.604	3
1	4	Typing .....	2.634	3
3		Human Anatomy and Physiology .....	5.608	3
1	2	Nutrition for Health Occupations .....	5.430	2

## Term 3

2		Medical Science .....	5.605	2
2	16	Medical Assisting, Advanced Procedures .....	5.606	4
3		Medical Office Management .....	5.607	3
3		Business Correspondence .....	2.672	3
1		First Aid .....	5.513	1
3		General Education Elective .....		3

## Technical Nursing Program

The Technical Nursing Program prepares selected students for the technical nurse role as a beginning staff nurse in hospitals and other health agencies. The graduate will earn an Associate Degree in Nursing and will be eligible to take the licensure examination for becoming a registered nurse in the State of Oregon.

The Technical Nursing Program offers preparation for nursing within the fabric of general education. The selected content in general and nursing courses is based upon fundamental principles of the humanities and on the social, natural, and health sciences. Nursing courses must be taken in sequence and a minimum grade of C is required in each nursing course to continue the sequence. Students are involved in patient-family nursing situations in the community hospitals and health agencies as an integral part of the program.

Applicants must meet the admission criteria for the Technical Nursing Program and have a high school grade average of 2.0 or above.

Upon the satisfactory completion of the requirements in the Technical Nursing Program, an Associate in Science Degree will be awarded.

Associate in Science Degree: Required 96 Term Units.

# Technical Nursing Curriculum

## First Year

### Term 1

Hours Work		Course Title	Course No.	Term Units
Class	Lab.			
4	12	Nursing: Fundamentals .....	5.701	7
1		Health Occupations Overview .....	5.700	1
3	3	Basic Science Principles .....	5.721	4
3		Psychology .....	Psy 201	3
3		English Composition .....	Wr 111	3

### Term 2

4	12	Nursing: Maternal & Child Health .....	5.702	8
3	3	Human Anatomy and Physiology .....	5.722	4
3		Psychology .....	Psy 202	3
3		English Composition .....	Wr 112	3

### Term 3

4	12	Nursing: Long Term Illness .....	5.703	8
3	3	Microbiology .....	5.723	4
3		Psychology .....	Psy 203	3

## Second Year

### Term 4

4	15	Nursing: Short Term and Acute Illness ....	5.704	9
3		Speech .....	Sp 111	3
3		Group Process .....	5.730	3

### Term 5

4	15	Nursing: Mental Illness and Mental Retardation .....	5.705	9
3		Introduction to Political Science .....	PS 101	3
3		Anthropology .....	Anth 103	3

### Term 6

4	15	Advanced Nursing .....	5.706	9
3		American Government .....	Ps 201	3
3		Nursing Trends and Practice .....	5.720	3

## Practical Nursing Program

The Practical Nurse is a person prepared in an approved educational program and is qualified for nursing practice by licensure of a state board of nursing. She participates in direct patient care as a nursing team member independently functioning in simple, relatively stable nursing situations and is an assistant to the registered nurse and/or licensed physician. The adequately prepared and properly utilized Practical Nurse contributes immeasurably to quality patient care.

The Practical Nursing curriculum is an occupational preparatory program. The purpose is to prepare selected people for a career in practical nursing, who are able to perform the functions of a practical nurse, and who help fulfill the need of health services in Oregon, and to prepare the student for examination given by the Oregon State Board of Nursing for licensing practical nurses.

The one year curriculum is based on principles of education and organized around the nurse's defined functions. Subjects included are practical nursing, basic sciences, and communication skills. Clinical laboratory experience is provided in hospitals and health agencies in the community. Nursing faculty are responsible for planning and selecting student learning.

Applicants for the Practical Nursing program 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 examination, and have suitable personal traits and character.

The Certificate of Completion is awarded to those individuals who have completed the requirements for the Certificate as outlined in the general information section of this catalog.

## Practical Nursing Curriculum

<b>Term 1</b>				
Hours Class	Work Lab.	Course Title	Course No.	Term Units
5	12	Practical Nursing .....	5.520	9
3	3	Basic Sciences .....	5.526	4
3		Communication Skills .....	1.101	3
<b>Term 2</b>				
2	21	Practical Nursing .....	5.521	9
3	3	Basic Sciences .....	5.527	4
<b>Term 3</b>				
2	21	Practical Nursing .....	5.522	9
3	3	Basic Sciences .....	5.528	4

# Industrial Supervisory Program

This program is a planned series of courses in Supervisory Methods and Techniques. The courses are available to individuals who are currently involved in supervisory duties or personnel who will assume supervisory duties eventually.

An interested individual may elect to follow one of three planned programs, depending upon his ultimate needs, culminating in a Certificate or an Associate Degree.

Instructors for these courses are selected from industry. These instructors are selected on the basis of experience in industry and special competence in the course to be taught. The instructor also must have a State teaching certificate in Industrial Supervision as the result of 60 hours of teacher training which is provided in cooperation with Oregon State University, School of Education.

The following gives an example of a suggested planned program of study.

## TYPICAL COURSE SEQUENCE

<b>I. FOR CERTIFICATE IN BASIC SUPERVISORY PRACTICES</b>		
	(Limited Certificate)	*Term Units
✓	Elements of Supervision .....	3
	Basic Psychology for Supervisors .....	3
	Developing the Employee Through Training .....	3
✓	Written Communications, or Oral Communications .....	3
	(Restricted elective from Supervisory Courses) .....	3
	Elective, or credit evaluation for supervisory experience .....	3
	<b>Total</b> .....	<b>18</b>
<b>II. FOR CERTIFICATE IN PRINCIPLES AND PRACTICES (Special Certificate)</b>		
	(Courses required beyond those included in Limited Certificate)	
	Human Relations .....	3
	Labor Management Relations .....	3
	Oral Communications, or Written Communications .....	3
	(Restricted elective from General Education courses) .....	3
	(Occupational elective course) .....	3
	(Occupational elective course) .....	3
	(Occupational elective course) .....	3
	Electives or credit evaluation for supervisory experience .....	6
	<b>Cumulative Total</b> .....	<b>45</b>
<b>III. FOR DIPLOMA OR ASSOCIATE DEGREE</b>		
	(Courses required beyond Limited and Special Certification)	
✓	Methods of Improvement for Supervisors .....	3
	Cost Control for Supervisors .....	3
	Industrial Economics .....	3
	(Restricted elective from Supervision courses) .....	3
	(Restricted elective from General Education courses) .....	3
	(Restricted elective from General Education courses) .....	3
	(Restricted elective from General Education courses) .....	3
	(Occupational elective course) .....	3
	(Occupational elective course) .....	3
	Electives, or credit for supervisory experience .....	18
	<b>Cumulative Total</b> .....	<b>90</b>

\*(A term unit represents 10 clock hours in class)

## ALLOWANCE OF CREDIT FOR SUPERVISORY EXPERIENCE

Supervisory experience may be credited for General Elective courses up to a maximum of 24 hours.

## CONTEMPORARY CORRECTIONS PROGRAM

A program developed as a basic orientation to the humanities and processes that apply in the corrections field. The courses are designed for the further development of those persons presently involved in corrections work, and for those who wish to prepare for entry into this field of employment.

The following gives an example of the planned program of study.

	Term Units
<b>I. BASIC CERTIFICATE IN CORRECTIONS (Limited Certificate)</b>	
*Communications Skills 1.101 .....	3
*Introduction to Psychology 1.606 .....	3
*Introduction to Sociology .....	3
*Social Disorganization .....	3
Approved Elective (See II B) .....	3
Elective, or credit evaluation for correctional experience .....	3
Total .....	18
<b>II. CERTIFICATE IN CONTEMPORARY CORRECTIONS (Special Certificate)</b>	
A. Courses required beyond those of Basic Certificate:	
*American Institutions 1.600 .....	3
*Communication Skills 1.104 .....	3
*Correctional Processes .....	3
B. Approved Electives: .....	12
Correctional Communities .....	(3)
*Developmental Psychology .....	(3)
*Criminology .....	(3)
*Juvenile Delinquency .....	(3)
Introduction to Law Enforcement .....	(3)
Psychology of Adolescence .....	(3)
C. Elective, or credit evaluation for correctional experience .....	6
Cumulative Total .....	45
<b>III. ASSOCIATE DECREE IN CORRECTIONS</b>	
A. Courses required beyond Special Certificate from approved electives (II B and following) .....	
Personality and Character Disorders .....	(3)
Psychology of Adjustment .....	(3)
Group Behavior .....	(3)
Small Group Dynamics .....	(3)
Parole and Probation .....	(3)
Correctional Administration .....	(3)
Analysis of Criminal Careers .....	(3)
Introduction to Abnormal Psychology .....	(3)
Introduction to Counseling .....	(3)
B. Electives, or credit for experience and inservice training in corrections .....	18
Cumulative Total .....	90

\*Courses available 1967-1968.

## Real Estate Program

This evening program is designed to serve the needs of persons who are already employed in the field of real estate and who wish to increase their professional acumen, develop their judgment skills, and deepen their perception of real estate problems.

Experienced salesmen and brokers may wish to have their occupational experience equated with certain courses, thereby reducing the total hours of class work necessary for completion of the program.

The Certificate of Completion is awarded to those individuals who satisfactorily complete the required courses within the curriculum.

### Requirements for the Certificate of Completion:

18 term units of required courses.

9 term units of recommended electives.

Course No.	Courses Required	Term Units
9.262	Real Estate Principles .....	3
9.263	Real Estate Principles .....	3
9.264	Real Estate Practice .....	3
9.265	Real Estate Law .....	3
9.266	Real Estate Appraisal .....	3
9.267	Real Estate Finance .....	3

Course No.	Courses Required	Term Units
9.268	Real Estate Trends and Development .....	3
9.270	Real Estate Salesmanship .....	3
9.271	Fund. of Real Estate Taxation .....	4
9.272	Fundamentals of Exchanging .....	3
9.274	Elements of Design and Construction .....	3
9.275	Commercial and Investment Property .....	4
9.276	Real Estate Sales Promotion .....	3
9.277	Property Management .....	2
9.278	Subdividing and Community Planning .....	2
9.280	Real Estate Appraisal .....	3
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Mathematics 4.204 .....	83
Practical Descriptive Geometry 6.127 .....	83
Shop Arithmetic 4.246 .....	83
Slide Rule Operations 6.137 .....	83
Technical Mathematics 6.261 .....	83
Technical Mathematics 6.262 .....	83
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Bench and Layout Practices 4.810	90
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Blueprint Reading for Construction 4.859	90
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# COURSE DESCRIPTIONS

## General Education Courses

		Lec.	Lab.	Term Units
<b>American Institutions</b>	<b>1.600</b>	<b>3</b>	<b>0</b>	<b>3</b>

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, the family, and social classes; the American economic system, its concepts and organization; public opinion, the American political system, and international relations.

<b>Business Economics</b>	<b>1.524</b>	<b>3</b>	<b>0</b>	<b>3</b>
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*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 as an employee.*

<b>Communication Skills</b>	<b>1.101</b>	<b>3</b>	<b>0</b>	<b>3</b>
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This course is designed to improve the student's communicative skills through reading, listening, writing and speaking, with emphasis on research and writing. The practical phase of communication problems is kept in the foreground. Problems in reading, note taking, gathering information, report writing, and conventional usages of mechanics and grammar are utilized.

<b>Communication Skills</b>	<b>1.104</b>	<b>3</b>	<b>0</b>	<b>3</b>
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This course is a continuation of the processes of improving the student's speaking, reading, writing, and listening skills, with emphasis on speaking.

Practical applications are provided for the student to develop effective habits of communication through speaking, participating in conferences, presentation of reports, gathering information, listening, observing, and evaluation sources.

Prerequisite: Communication Skills 1.101 or equivalent.

<b>Constitutional Government</b>	<b>1.601</b>	<b>3</b>	<b>0</b>	<b>3</b>
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This course is a study of the Constitution of the United States and its meaning to the individual through government. This course is designed to develop in the student, an understanding of the meaning of the Constitutional provisions and an appreciation of its contemporary relevance. In the treatment employed here the historic roots of the document are studied to establish the precedents for particular institutional arrangements, e. g., bicameral legislatures.

<b>Consumer Economics</b>	<b>1.525</b>	<b>3</b>	<b>0</b>	<b>3</b>
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Consumer Economics 1.525 deals with the principles and problems of the consumer and how he can get the most out of life through the fullest use of his money, time and energy. Credit, Investment, Housing, Insurance, Consumer Law, Budgeting are examples of the subjects covered. The course is designed to explain, guide and show the student how to become more efficient in meeting everyday problems thus laying the ground work for competent adult consumership.

		Lec.	Lab.	Term Units
<b>Employer-Employee Relations</b>	<b>4.500</b>	<b>3</b>	<b>0</b>	<b>3</b>

The objective of this course is to provide an understanding of the rights and responsibilities of Labor and Management, and the roles played by them in relation to the individual, the community, and the national economy. Areas covered include history, organization, laws, wage and hours, contracts, and community responsibilities.

<b>Introduction to Psychology</b>	<b>1.606</b>	<b>3</b>	<b>0</b>	<b>3</b>
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This course is designed for the student who desires an introductory course in psychology. It explains the scopes, methods, and basic concepts of psychology. Some of the subjects covered are motivation, learning, thinking, perception, emotion, personality, mental health, animal behavior, and applied psychology.

<b>Occupational Skills &amp; Geography</b>	<b>1.302</b>	<b>3</b>	<b>0</b>	<b>3</b>
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This course specifies what the geographic factors are and how they exert an influence on occupational endeavors. Special emphasis is placed on the geographic factors of Oregon and Washington and upon the occupational courses being taught. Each student learns how his specific occupational field is influenced by geography through development of a study of his field in different geographic settings.

<b>Psychology of Human Relations</b>	<b>1.608</b>	<b>3</b>	<b>0</b>	<b>3</b>
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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 are considered with their particular reference to the application to the on-the-job problems. Other problems investigated are employee selection supervision, job satisfaction, and industrial conflict as they relate to the employee and his work. Attention is also given to personal and group dynamics to 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.

<b>Public Speaking</b>	<b>1.610</b>	<b>2</b>	<b>2</b>	<b>3</b>
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This course is intended to develop speaking, skills with emphasis on the dual role of speech as both a speaking and listening skill, and on adjusting the approach to the specific audience. Practice is provided through individual speeches and group discussions with careful attention to the general principles of speech, stress is placed on poise and confidence and on understanding their psychological basis.

<b>Technical Report Writing</b>	<b>6.126</b>	<b>3</b>	<b>0</b>	<b>3</b>
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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 a report, and visual aids in a report.

Prerequisite: Communication Skills 1.101.

### Mathematics Courses

<b>Analysis (Mathematics)</b>	<b>4.207</b>	<b>2</b>	<b>2</b>	<b>3</b>
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A theory-lab course designed to provide for practical application and problem solving using basic mathematical concepts. Training is provided on a variety of calculating machines.

Prerequisite: Math. 4.202 or equivalent.

		Lec.	Lab.	Term Units
<b>Business Mathematics</b>	<b>6.918</b>	<b>3</b>	<b>0</b>	<b>3</b>

This is a course designed to acquaint the student with practical mathematical applications in the business area. Fundamentals of applied algebra, symbols, equations, ratios, and proportion, exponents, radicals and formulas are covered with emphasis on business applications.

<b>Business Mathematics</b>	<b>6.923</b>	<b>3</b>	<b>0</b>	<b>3</b>
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This is a course in practical business mathematics. The fundamentals of simple and compound interests, discount, annuities, and sinking funds, bond amortization tables, ratio and proportion inequalities, algebra, business graphs, percentage, redundant digit check systems, numerical relationships, and number coding systems.

<b>Business Mathematics</b>	<b>2.650</b>	<b>3</b>	<b>0</b>	<b>3</b>
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This is a course in practical mathematics including problems composed of whole numbers, fractions, measurements, formulas, graphs and roots. The mathematics used in determining dosage is included as related information.

<b>Data Processing Mathematics</b>	<b>6.925</b>	<b>3</b>	<b>0</b>	<b>3</b>
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An introduction to business data processing mathematics. The course contains accounting control logic, binary numbering systems, accounting numbering systems, report and accounting system balancing methods, and business data processing formulas, with an emphasis on

<b>Data Processing Mathematics</b>	<b>6.926</b>	<b>3</b>	<b>0</b>	<b>3</b>
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This is an applied course in mathematics for Electronic Computer Applications. It provides a practical foundation for the solution of business, business management and applied science problems.

<b>Data Processing Mathematics</b>	<b>6.927</b>	<b>3</b>	<b>0</b>	<b>3</b>
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A continuation of Data Processing Mathematics. This course covers: problem solutions by iteration, matrix algebra, linear programming, etc. Sample problems developed in class are operated on the IBM 1401 Computer and then analyzed.

<b>Electrical Mathematics</b>	<b>6.115</b>	<b>3</b>	<b>0</b>	<b>3</b>
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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.

<b>Engineering Problems</b>	<b>6.138</b>	<b>0</b>	<b>2</b>	<b>1</b>
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This is a course in the presentation of technical data and computations. The procedures for dimensional analysis, recognition and usage of unit systems, preparation and usage of graphs and curves, and practical applications of such skills are emphasized. A background of history and fields of engineering is presented. Practical applications will utilize diagrams, graphs, charts, tables, curves, and the slide rule.

<b>Mathematics</b>	<b>4.200</b>	<b>2</b>	<b>2</b>	<b>3</b>
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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.

		Lec.	Lab.	Term Units
<b>Mathematics</b>	<b>4.202</b>	<b>2</b>	<b>2</b>	<b>3</b>
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.				
<b>Mathematics</b>	<b>4.204</b>	<b>2</b>	<b>2</b>	<b>3</b>
This course concentrates on actual problems encountered by machinists, precision inspectors, tool-and-diemakers, draftsmen, tool designers, and other workers in related industrial occupations. It applies arithmetic, algebra, geometry, trigonometry, and their various phases to jobs encountered 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.				
<b>Practical Descriptive Geometry</b>	<b>6.127</b>	<b>1</b>	<b>2</b>	<b>2</b>
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 shown to be necessary for the draftsman.				
Prerequisite: Third Term standing or approval of department head.				
<b>Shop Arithmetic</b>	<b>4.246</b>	<b>2</b>	<b>2</b>	<b>3</b>
A one term course in basic arithmetic used in the weld shop. It will cover addition, subtraction, multiplication, division, ratios, and triangles in preparation for layout work and calculation of time and material costs, deposition, rates, etc.				
<b>Slide Rule Operations</b>	<b>6.137</b>	<b>0</b>	<b>2</b>	<b>1</b>
This course consists of a study of the slide rule applicable to problem solving in the technical fields. This study involves care, adjustment, and manipulation of the slide rule. Practical application of slide rule operation with emphasis on problem solving and accuracy.				
<b>Technical Mathematics</b>	<b>6.261</b>	<b>3</b>	<b>0</b>	<b>3</b>
This course covers algebraic operations including the study of first and second degree equation solutions by analytic and graphical means, exponents and radicals, and their respective applications to technologies. Concurrent with the above, a review of plane geometric principles and introduction to the fundamental trigonometry operations will be offered.				
<b>Technical Mathematics</b>	<b>6.262</b>	<b>3</b>	<b>0</b>	<b>3</b>
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, densities and equations, and graphs of trigonometric functions.				
Prerequisites: Technical Mathematics 6.261 or equivalent.				
<b>Technical Mathemaitcs</b>	<b>6.266</b>	<b>3</b>	<b>0</b>	<b>3</b>
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
<b>Applied Physics</b>	<b>6.366</b>	<b>3</b>	<b>2</b>	<b>4</b>
<p>A course in applied physics covering magnetism and electricity on the post high school level. Basic electronic circuits, 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.</p>				
<b>Applied Physics</b>	<b>6.370</b>	<b>3</b>	<b>2</b>	<b>4</b>
<p>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.</p>				
<b>Applied Physics</b>	<b>6.371</b>	<b>3</b>	<b>2</b>	<b>4</b>
<p>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 demonstrations and experiments to clarify principles and procedures covered in class.</p>				
<b>Basic Sciences for Health Occupations</b>	<b>5.601</b>	<b>3</b>	<b>3</b>	<b>4</b>
<p>This course is designed to present the introductory concepts of physics, chemistry and microbiology. It includes practical application of problem solving, scientific observation and measurement, use of equipment and basic laboratory techniques.</p>				
<b>Basic Science Principles</b>	<b>5.721</b>	<b>3</b>	<b>3</b>	<b>4</b>
<p>The meaning of science; scientific thinking and methods; a survey of introductory concepts of physics, chemistry, and microbiology underlying skills essential to health occupations.</p>				
<b>Chemistry</b>	<b>6.276</b>	<b>3</b>	<b>2</b>	<b>4</b>
<p>A continuation of Introductory Chemistry covering the basic principles of General Chemistry.</p>				
<b>Elementary Science for Firefighters</b>	<b>5.103</b>	<b>3</b>	<b>2</b>	<b>4</b>
<p>Characteristics and behavior of fire; fundamentals of physical laws and chemical reactions occurring in fire and fire suppression; analysis of factors contributing to fire - its cause, rate of burning, heat generation and travel, by-products of combustion, and to its confinement, control, and extinguishment.</p>				
<b>Elementary Wood Chemistry</b>	<b>6.279</b>	<b>2</b>	<b>3</b>	<b>3</b>
<p>This course is designed to acquaint the student with the basic chemical properties of wood, wood adhesives, wood preservatives, wood finishes and the basic chemistry of pulp and paper. Basic tests and testing methods are included.</p>				
<p>Prerequisite: Chemistry 6.276.</p>				
<b>Fire Science</b>	<b>6.995</b>	<b>3</b>	<b>2</b>	<b>4</b>
<p>A course in practical physics covering matter, measurements, machines and energy. Laboratory time is provided for demonstrations and experiments to help clarify the principles and procedures covered in class.</p>				

		Lec.	Lab.	Term Units
<b>Fire Science</b>	<b>6.996</b>	<b>3</b>	<b>2</b>	<b>4</b>

The physical and chemical properties of substances; chemical bonds and reactions; ionization; covalent substances. Laboratory time is provided for clarifying demonstrations and experiments.

<b>Human Anatomy and Physiology</b>	<b>5.608</b>	<b>3</b>	<b>0</b>	<b>3</b>
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Study of normal structure and function of the human body; characteristics of the cell as basis for life; organization of tissues, organs and systems; structure and function of body tissues, organs and systems; structure and function of body systems. Presentation consists of lecture and demonstration.

<b>Human Anatomy and Physiology</b>	<b>5.722</b>	<b>3</b>	<b>3</b>	<b>4</b>
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Structure and function of the human body, structure, function and characteristics of the living cell; organization of tissues, organs and systems; structure and function of body systems.

<b>Introductory Chemistry</b>	<b>6.275</b>	<b>3</b>	<b>2</b>	<b>4</b>
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An introductory course presenting the fundamentals of modern chemistry for students who have had little or no previous training in chemistry. The majority of the course will cover the basic principles and fundamentals of chemistry with emphasis on industrial application.

<b>Microbiology</b>	<b>5.723</b>	<b>3</b>	<b>3</b>	<b>4</b>
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Continuation of survey of bacteria and other microorganisms, emphasizing their impact upon human health and welfare.

<b>Practical Physics</b>	<b>4.300</b>	<b>3</b>	<b>2</b>	<b>4</b>
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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.

<b>Practical Physics</b>	<b>4.302</b>	<b>3</b>	<b>2</b>	<b>4</b>
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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.

### Technical Courses

<b>Accident Prevention and First Aid</b>	<b>4.190</b>	<b>0</b>	<b>2</b>	<b>1</b>
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A study of accident prevention, recognition of hazards, good housekeeping and personnel protective equipment. Study and practice of emergency treatment for various types of injuries, control of bleeding, artificial respiration, transportation, splinting and bandaging. Course leads to a Red Cross Standard Certificate.

<b>Accounting</b>	<b>6.920</b>	<b>3</b>	<b>3</b>	<b>4</b>
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An introduction to the basic procedures of accounting and the preparation of financial statements. The methods of recording business transactions, the books commonly used, the techniques of closing the books periodically.

<b>Accounting</b>	<b>6.921</b>	<b>3</b>	<b>3</b>	<b>4</b>
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Accounting problems arising in different types of business, such as the corporation, partnerships, and individual proprietorship and interpretation of financial statements.

Prerequisite: Accounting 6.920.

		Lec.	Lab.	Term Units
<b>Accounting</b>	<b>6.922</b>	<b>3</b>	<b>3</b>	<b>4</b>

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

<b>Advanced Electric Accounting Machine Applications</b>	<b>6.946</b>	<b>2</b>	<b>6</b>	<b>4</b>
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This course is a continuation of Intermediate Electric Accounting Machine Applications with emphasis on more complex business data processing applications. Students will be assigned a variety of projects designed to apply a wide range of concepts and practices in unit record installations.

Prerequisite: Intermediate Electric Accounting Machine Applications.

<b>Advanced Electric Accounting Machine Operations</b>	<b>6.943</b>	<b>2</b>	<b>6</b>	<b>4</b>
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This course is a continuation of Intermediate Electric Accounting Machine Operations with emphasis on development of more complex operating procedures. Comprehensive operating procedures and control panel wiring practices will be stressed.

Prerequisite: Intermediate Electric Accounting Machine Operations.

<b>Advanced Electronic Circuits</b>	<b>6.216</b>	<b>2</b>	<b>3</b>	<b>3</b>
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Each student designs and builds a project of his own. Emphasis is placed upon the design, quality of workmanship and upon the written manual for the project.

<b>Advanced Industrial Electronics</b>	<b>6.248</b>	<b>3</b>	<b>3</b>	<b>4</b>
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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 motors, synchronous motors and self-synchronous devices, single phase, motors, circuit-protective and switching equipment, electrical instruments and electrical measurement.

Prerequisite: Industrial Electronics 6.218.

<b>Advanced Inert Gas and Shielded Arc Welding</b>	<b>4.164</b>	<b>2</b>	<b>6</b>	<b>4</b>
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A continuation of Inert Gas Welding 4.163. Introducing fundamentals and operations of consumable electrodes and metallic shielded arc welding.

Prerequisite: Inert Gas Welding 4.163.

<b>Advanced Laboratory and Chairside Procedures</b>	<b>5.407</b>	<b>2</b>	<b>3</b>	<b>3</b>
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This course is designed to teach the student the principles of full and partial denture prosthesis, and the use of laboratory equipment. She will be able to invest and cast inlays and assist in other advanced laboratory procedures.

<b>Advanced Lathe Practices</b>	<b>4.833</b>	<b>2</b>	<b>4</b>	<b>3</b>
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A continuation of the Machine Tool 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.

Prerequisite: Machine Shop Practices 4.841.

		Lec.	Lab.	Term Units
<b>Advanced Milling Machine Practices</b>	<b>4.837</b>	<b>2</b>	<b>4</b>	<b>3</b>
A continuation of the Machine Tool series of classes. Studies include: straddle milling, rotary table work, dividing head construction and indexing, gear cutting and terminology and boring work on milling machines. Laboratory time is provided for student operation of equipment.				
Prerequisite: Machine Shop Practices 4.841.				
<b>Advanced Nursing</b>	<b>5.706</b>	<b>4</b>	<b>15</b>	<b>9</b>
Meeting the needs of children and adults in more complex nursing situations. Nursing care of a group of children or adults, of a child or adult with multiple problems, a child or adult in a crisis situation, a child or adult in emergency situations.				
<b>Advanced Oxyacetylene and Electric Arc Welding</b>	<b>4.162</b>	<b>1</b>	<b>3</b>	<b>2</b>
A continuation of Oxyacetylene Welding 4.161 and Electric Arc Welding 4.160. Developing techniques in the more complicated weld applications involving both ferrous and nonferrous materials.				
Prerequisite: Electric Arc Welding 4.160. Oxyacetylene Welding 4.161.				
<b>Amplifier Circuits and Designs 6.217</b>		<b>3</b>	<b>6</b>	<b>5</b>
A continuation of vacuum tube and transistor analysis. 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 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.				
Prerequisite: Vacuum tube and transistor analysis 6.223, or approval of department head.				
<b>Antennas and Transmission Lines 6.231</b>		<b>2</b>	<b>0</b>	<b>2</b>
A course in both the practical and theoretical aspects of transmission lines and antennas. Basic antenna theory of antenna design, radiation patterns, phasing, and coupling networks are studied. Coaxial and open-wire transmission line studies are emphasized for all frequencies.				
Prerequisite: Network Analysis 6.230.				
<b>Applied Fluid Power</b>	<b>6.117</b>	<b>2</b>	<b>2</b>	<b>3</b>
A course designed to provide instruction in the fundamental principles of fluid power systems. Included is the study of the basic components of fluid power systems, how they are combined to build up circuits, and the uses of these circuits. The students will learn the basics of design and use of fluid power systems, and the use of various components in these circuits. Laboratory time is provided to illustrate and amplify the classroom learning.				

		Lec.	Lab.	Term Units
<b>Applied Heat Power</b>	<b>6.616</b>	<b>2</b>	<b>3</b>	<b>3</b>

A continuation of Applied Thermodynamics 6.615. A study of the various types of heat engines will be made including their basic cycles. Fuels and the energy available from them will be analyzed to determine engine output efficiency. Valve and ignition timing will be studied in relationship to the fuels. Laboratory time is provided to analyze and test the various points brought out during the lectures.

Prerequisite: Applied Thermodynamics 6.615.

<b>Applied Mechanics</b>	<b>6.109</b>	<b>2</b>	<b>3</b>	<b>3</b>
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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.

Prerequisite: Third Term standing or approval of department head.

<b>Applied Mechanics</b>	<b>6.111</b>	<b>2</b>	<b>3</b>	<b>3</b>
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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 department head.

<b>Applied Stenography</b>	<b>2.675</b>	<b>1</b>	<b>3</b>	<b>2</b>
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This course will coordinate and intensify all the training the student has received. The classroom situation will simulate that of an office with the student taking dictation in shorthand and from the dictating machine for transcribing at the typewriter in mailable form. It is planned that the student upon completion of this term of work will have gained from this on-the-job type experience confidence in her ability to enter the business world and that her production work will be of the highest quality.

<b>Applied Thermodynamics</b>	<b>6.615</b>	<b>2</b>	<b>3</b>	<b>3</b>
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The purpose of this course is to initiate the student into some of the principles of thermodynamics. More important, these principles are to be shown in action, that is, in relation to the many heat engines and other devices that transfer energy in the form of heat. Laboratory time is provided to achieve this end, and also to enable students to consult with the instructor on any parts of their study which may be causing difficulty.

<b>Architectural Drafting</b>	<b>4.226</b>	<b>0</b>	<b>8</b>	<b>3</b>
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A course emphasizing basic architectural drafting techniques and methods. The course will cover architectural lettering, layout, arrangement, symbols, and conventional construction methods used in residential or light commercial buildings.

Prerequisite: Two terms of drafting.

<b>Architectural Drafting</b>	<b>4.227</b>	<b>0</b>	<b>8</b>	<b>3</b>
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A course emphasizing basic architectural drafting techniques and methods. The course will familiarize the student with advance planning, detailing, design, presentation drawing, and rendering.

Prerequisite: Architectural Drafting 4.226.

		Lec.	Lab.	Term Units
<b>Architectural Drawing</b>	<b>4.107</b>	<b>0</b>	<b>7</b>	<b>3</b>
<p>This course is designed to train the student in the area of architectural detailing. Typical units of study will be footings and foundation walls, sill construction details, conventional house framing, window details, stairway details, fireplace details, floor plans, and elevations. The student will prepare a complete set of detail plans for an average sized home in meeting the requirements for this course.</p> <p>Prerequisite: Drafting 4.101.</p>				
<b>Asphalt and Concrete Practice</b>	<b>6.556</b>	<b>1</b>	<b>2</b>	<b>2</b>
<p>This is a course for developing an understanding of the composition, materials, proportion, mixing and properties of concrete of concrete and asphaltic materials. Design, testing and inspection is also studied.</p>				
<b>Asphalt Paving</b>	<b>6.551</b>	<b>2</b>	<b>2</b>	<b>3</b>
<p>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.</p> <p>Prerequisite: Sixth Term standing or approval of department head.</p>				
<b>Automated Systems and Procedures</b>	<b>6.904</b>	<b>3</b>	<b>0</b>	<b>3</b>
<p>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.</p>				
<b>Basic Arc Welding</b>	<b>4.240</b>	<b>2</b>	<b>9</b>	<b>4</b>
<p>This is a beginning course in arc welding, covering arc welding equipment, materials, and procedures as they are used in industry. This course is designed to develop basic techniques in flat, horizontal, vertical and overhead welding by demonstration and supervised practice. Basic technical and related information concerning processes and metallurgy will be included.</p>				
<b>Basic Oxy-Acetylene Welding</b>	<b>4.242</b>	<b>2</b>	<b>6</b>	<b>4</b>
<p>This is a beginning course in oxy-acetylene welding covering basic procedures and techniques used in flame cutting and welding. Related information concerning metallurgy and the control of distortion will be included. This course is designed to develop basic techniques in flat, horizontal, vertical, and overhead welding by demonstration and supervised practice.</p>				
<b>Basic Tool Design</b>	<b>4.608</b>	<b>1</b>	<b>6</b>	<b>3</b>
<p>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 layout 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.</p>				

		Lec.	Lab.	Term Units
<b>Bench and Layout Practices</b>	<b>4.810</b>	<b>2</b>	<b>4</b>	<b>3</b>

This is a course on bench tools and their use, with layout principles. The 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.

<b>Blueprint Reading and Sketching</b>	<b>4.244</b>	<b>2</b>	<b>3</b>	<b>3</b>
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This course covers basic sketching techniques, and reading of three view drawings for welders. Included will be: dimensioning practices, scaling, line alphabet, notes and symbols. Emphasis will be placed on developing an ability in reading detail and weldment drawings.

<b>Blueprint Reading for Construction</b>	<b>4.859</b>	<b>1</b>	<b>2</b>	<b>2</b>
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Introductory course on the development of plans; symbols used for drawings; basic construction methods; and electrical, plumbing, and heating schematics. Students develop ability to interpret and draw plans for light construction.

<b>Blueprint Reading for Firemen</b>	<b>5.119</b>	<b>3</b>	<b>0</b>	<b>3</b>
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A course designed to teach the fundamentals of blueprint reading including the interpretation and meaning of lines, views, elevations, conventions and symbols, and the relationship of the various elements comprising architectural drawings and specifications.

<b>Building Construction for Fire Protection</b>	<b>5.116</b>	<b>3</b>	<b>0</b>	<b>3</b>
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Classification of buildings, structural features effecting fire spread; effect of fire on structural strength; fire stops and ratings of materials; fire retardants; Sanborne maps.

<b>Business Correspondence</b>	<b>2.672</b>	<b>3</b>	<b>0</b>	<b>3</b>
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A review of grammar and punctuation. Vocabulary building and spelling will receive emphasis. The majority of the emphasis of the course, however, will be on the writing of various types of business correspondence . . . letters, memorandums, reports, report format, etc.

<b>Business English Fundamentals</b>	<b>2.673</b>	<b>3</b>	<b>0</b>	<b>3</b>
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The purpose of this course is to develop the student's vocabulary, spelling ability, usage of words, and provides a review of the principles of grammar. Written and oral communications as required in business situations are emphasized.

<b>Business Law</b>	<b>2.320</b>	<b>3</b>	<b>0</b>	<b>3</b>
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A review of the nature of law as necessary. Emphasis is on contractual relationships, the law of sales, bailments, and the negotiable instruments. Case studies are used to illustrate the principles involved.

<b>Business Machines</b>	<b>2.660</b>	<b>1</b>	<b>3</b>	<b>2</b>
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Business Machines presents instruction in the application of office machines to bookkeeping and other office procedures. The general function of adding machines and calculators, the understanding of their application in business, and the acquiring of reasonable skill in their use is the goal.

		Lec.	Lab.	Term Units
<b>Business Machines</b>	<b>2.661</b>	<b>1</b>	<b>3</b>	<b>2</b>
An introduction to the variety of up-to-date tools (dictating, transcribing, and duplicating machines) being used today to handle business communications. The general function of the available machines, understanding of their care, and the acquiring of reasonable skills in their use is the major goal.				
<b>Business Management</b>	<b>2.202</b>	<b>3</b>	<b>0</b>	<b>3</b>
A practical course to give an understanding in five basic areas important to business. These areas are the billing of customers, the art of letter writing, simplified accounting, inventory control, and business advertising.				
<b>Business Management</b>	<b>6.908</b>	<b>3</b>	<b>3</b>	<b>4</b>
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.				
<b>Business Statistics</b>	<b>6.912</b>	<b>3</b>	<b>0</b>	<b>3</b>
A practical course in the use and interpretation of statistics, incorporating elementary statistical concepts, frequency distribution analysis; trends and seasonal business cycles.				
Prerequisites: Introduction to Business and Public administration and Accounting 6.920.				
<b>Cam and Gear Drafting</b>	<b>4.225</b>	<b>0</b>	<b>8</b>	<b>3</b>
This is an advanced course in the area of mechanical and machine drafting. The course work involved will include the calculation of various types of gears in addition to the detail drawing of gears. The principles of the cam will be discussed and displacement diagrams and detail drawings will be made to illustrate various types of motion and various styles of cams in common use.				
Prerequisite: Machine Drafting 4.223 and Technical Math. 6.261 or Math 4.204.				
<b>Chairside Assisting and Basic Lab Procedures</b>	<b>5.403</b>	<b>2</b>	<b>3</b>	<b>3</b>
A continuation of Basic Chairside procedures including mixing filling materials, preparing impression materials for use, and processing the impression. The course also provides practical dental laboratory experience in pouring models and making base plates, and bite rims.				
<b>Commercial and Investment Properties</b>	<b>2.419</b>	<b>3</b>	<b>0</b>	<b>3</b>
A course designed to provide information for licensed brokers and real estate salesmen. Emphasis is placed on process of selecting commercial property of all types for investment purposes. All factors of influence are analyzed. Determination of actual net income is stressed.				
<b>Communication Receivers</b>	<b>6.251</b>	<b>2</b>	<b>3</b>	<b>3</b>
A study of the principles of operation and servicing techniques of commercial radio receivers, mobile radio receivers, both AM and FM models, and CB radio receivers. Practical applications are applied in the laboratory sessions.				

	Lec.	Lab.	Term Units
<b>Concrete Construction and Design 6.123</b>	<b>2</b>	<b>5</b>	<b>4</b>

A study of concrete materials, 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.

Prerequisite: Sixth term standing or approval of department head.

<b>Concrete Practice 6.555</b>	<b>2</b>	<b>2</b>	<b>3</b>
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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.

Prerequisite: Sixth term standing or approval of department head.

<b>Construction Estimating 6.110</b>	<b>2</b>	<b>2</b>	<b>3</b>
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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 department head.

<b>Construction and Special Surveys 6.342</b>	<b>2</b>	<b>4</b>	<b>3</b>
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This course is designed to acquaint the student with the methods in the layout of structures, utilities for public and private projects, hydrographic surveys, and mine and tunnel surveys. The material will be presented in such a manner so as to lead the student to a more complete understanding of the basic principles involved in these varied types of surveys.

<b>Contracts and Specifications 6.118</b>	<b>3</b>	<b>0</b>	<b>3</b>
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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.

<b>Control and Layout Systems 4.143</b>	<b>1</b>	<b>6</b>	<b>3</b>
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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.

<b>Cost Accounting 2.576</b>	<b>3</b>	<b>0</b>	<b>3</b>
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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.

<b>Cost Computations 4.142</b>	<b>2</b>	<b>6</b>	<b>4</b>
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An introduction to the principles of time and cost computations for electronic-electrical device fabrication and installation.

		Lec.	Lab.	Term Units
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**Cruising and Scaling Records**      **3.619**      **3**      **2**      **4**

This course will familiarize the student with the forms and procedures used to record and report the measurements, gross and net, of logs and other minor forest products. Data Processing applications to reports and records will also be studied.

**Data Processing Applications**      **6.930**      **2**      **2**      **3**

Preparation of source data for computer entry for open and closed traverses; observation of problem operation; computer report interpretation.

Prerequisite: Second year standing.

**DC Theory and AC Theory**      **4.255**      **12**      **0**      **9**

This is a course covering the basic principles of DC and AC Theory. The DC and AC theory is a necessary background for the understanding of the various phases of electronics. A basis is given for the principles of operation of the radio and television circuits and their components. Basic mathematics is taught and coordinated with the theory areas as needed.

**DC Theory and AC Theory Lab.**      **4.256**      **0**      **6**      **2**

This course uses the basic principles of soldering, wire connecting and the proper use of hand tools and hand powered tools. Safety procedures to be used in the shop. Also practical experiments proving the theories taught in the DC Theory and AC Theory class, with the use of basic meters and other equipment as needed.

**Dental Anatomy and Physiology**      **5.405**      **3**      **0**      **3**

A study of anatomical terminology, head anatomy including skeletal structure, blood supply, innervation of the face, oral anatomy and physiology, muscles of mastication, paranasal sinuses.

**Dental Office Correspondence**      **5.412**      **3**      **0**      **3**

A course designed to provide the Dental Assistant student with a study of Dental Office communications pertaining to letter writing, billing, requisitioning, etc.

**Dental Office Practice**      **5.409**      **0**      **12**      **2**

This course consists of practice and observation in an ethical dental office.

**Dental Office Management**      **5.410**      **2**      **3**      **3**

A course designed to help the student with personal and vocational relationships, including the telephone, reception procedure, business office procedure, purchases, storage and care of supplies, and maintenance of office equipment.

**Dental Sciences**      **5.404**      **3**      **0**      **3**

A study of the various fields of specialized dentistry recognized by the American Dental Association and the science connected with them. The course includes such subjects as oral hygiene, bacteriology, sterilization, drugs, and diet and nutrition.

**Design Problems**      **4.605**      **2**      **6**      **4**

Opportunities in advanced drafting room practice are offered in this course. The student applies 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 judgment and work on his initiative.

		Lec.	Lab.	Term Units
<b>Dictating Machine Operation</b>	<b>2.663</b>	<b>1</b>	<b>4</b>	<b>3</b>

The student develops skill in the dictation of letters, memos, reports and in the techniques of transcribing from the recorded voice to the typewriter. The student learns to operate the transcriber and to transcribe a mailable copy with speed and efficiency.

<b>Dimensioning and Layout</b>	<b>4.224</b>	<b>2</b>	<b>0</b>	<b>2</b>
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This is a theory course designed to give a detailed presentation of modern dimension and layout techniques. Typical area of study in this course will include principles and rules of dimensioning, datums, elements of gaging, layout practices, and projective and descriptive geometry as related to layout drawings.

Prerequisite: Machine Drafting 4.221.

<b>Drafting</b>	<b>4.101</b>	<b>0</b>	<b>4</b>	<b>2</b>
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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.

<b>Drafting</b>	<b>4.105</b>	<b>0</b>	<b>4</b>	<b>2</b>
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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.

<b>Drill Equipment, Tools and Terminology</b>	<b>4.290</b>	<b>3</b>	<b>2</b>	<b>3</b>
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A comprehensive study of drilling machines and accessory equipment, to develop an understanding of the variety of tools and tool usage. To develop a further understanding of the terminology, vocabulary and terms as used in the drilling industry to be accomplished through lecture, demonstration and field trips.

<b>Drilling Machine Maintenance and Repair</b>	<b>4.296</b>	<b>3</b>	<b>4</b>	<b>4</b>
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A study of drilling machine maintenance and repair problems and the economy involved for sale and economical operation. A study of tool dressing is further undertaken to incorporate machining and welding skills which were developed earlier in the program.

<b>Drilling Setups and Operations</b>	<b>4.292</b>	<b>3</b>	<b>4</b>	<b>4</b>
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A course designed to acquaint the student with a variety of machine setups and operations under varied conditions. The study to be made with the assistance of lecture, demonstration and field trips.

<b>Earthwork Computations and Estimates</b>	<b>6.528</b>	<b>1</b>	<b>3</b>	<b>2</b>
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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 construction work.

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

		Lec.	Lab.	Term Units
<b>Electric Accounting Machine</b>				
<b>Logic Principles</b>	<b>6.940</b>	<b>2</b>	<b>6</b>	<b>4</b>
Intensive study and practice on punch card equipment studied in Introduction to Electric Accounting Machines 6.913. Application of machine programming logic principles necessary to perform machine functions.				
<b>Electric Arc Welding</b>	<b>4.160</b>	<b>1</b>	<b>3</b>	<b>2</b>
A course in fundamentals on electric arc welding. Machine setting and electrode selection. Development of technique and electrode manipulation.				
Prerequisite: Welding 4.150.				
<b>Electric Systems Management</b>	<b>6.947</b>	<b>2</b>	<b>0</b>	<b>2</b>
This course is designed to provide instruction in the fundamentals of management and coordination of an electric accounting machine installation. Management of operating procedures, machine acquisition, personnel administration, and coordination of business data processing activities will be stressed.				
<b>Electrical Circuits</b>	<b>6.206</b>	<b>3</b>	<b>3</b>	<b>4</b>
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 wave-form analysis of combined networks.				
<b>Electrical Drafting</b>	<b>4.103</b>	<b>0</b>	<b>4</b>	<b>2</b>
A course covering the techniques and inventions used in the electronic-electrical industry. It includes symbols, wiring diagrams, introduction to pictorial 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.				
<b>Electrical Theory AC</b>	<b>6.202</b>	<b>3</b>	<b>3</b>	<b>4</b>
A continuation of electrical theory on the basis of alternating 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, the electrical measurement instruments.				
Prerequisite: Electrical Theory DC 6.200; Technical Mathematics 6.261, or approval of department head.				
<b>Electrical Theory DC</b>	<b>6.200</b>	<b>3</b>	<b>3</b>	<b>4</b>
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.				

		Lec.	Lab.	Term Units
<b>Electricity</b>	<b>6.208</b>	<b>3</b>	<b>2</b>	<b>4</b>

An introduction to electrical circuitry and equipment with emphasis on the concepts of electrical physics. Students will study electricity and magnetism, circuits and components, currents, power, basic electronics and motors and controls.

<b>Electronic Data Processing</b>	<b>6.240</b>	<b>3</b>	<b>0</b>	<b>3</b>
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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 introduction to Boolean Algebra and the use of block diagrams; analyzes the major divisions of digital computer in terms of the arithmetic element, the memory element, input and output devices, and the control element.

<b>Electronic Data Processing Applications</b>	<b>6.950</b>	<b>3</b>	<b>0</b>	<b>4</b>
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A continuation of Electronic Data Processing Applications, with an emphasis on cybernetics and scientific data processing. Laboratory periods will be devoted to processing current data in school, research, and development fields.

<b>Electronic Data Processing Machine Applications</b>	<b>6.949</b>	<b>3</b>	<b>3</b>	<b>4</b>
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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 6.903 and Introduction to Systems and Procedures 6.902.

<b>Electronic Data Processing Machine Operations</b>	<b>6.909</b>	<b>2</b>	<b>3</b>	<b>3</b>
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Study and practice in computer center operations including console operating, job setup, tape changing, and operation peripheral equipment such as card readers, punches, and high speed printers.

Prerequisite: Introduction to Automatic Data Processing 6.900 or approval of department head.

<b>Electronic-Electrical Standards</b>	<b>4.114</b>	<b>3</b>	<b>0</b>	<b>3</b>
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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.

<b>Electronic Instruments</b>	<b>6.220</b>	<b>2</b>	<b>2</b>	<b>3</b>
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A study of both service and laboratory type instruments, to gain the knowledge of the fundamental operating principles, to understand how the instruments work, using representative examples and explaining the specific function of the instruments and illustrate practical applications of the instruments.

<b>Electronic Systems Management</b>	<b>6.948</b>	<b>2</b>	<b>0</b>	<b>2</b>
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This is a course in computer systems management. It covers the basic standards of management systems control, systems analysis, operation and performance standards.

		Lec.	Lab.	Term Units
<b>Elementary Geology</b>	<b>4.305</b>	<b>3</b>	<b>2</b>	<b>4</b>
A study of basic structure geology as it pertains to the drilling industry. To develop an understanding and recognition of geological formation, topography and maps to better identify and locate satisfactory drilling sites in relationship to existing water tables.				
<b>Elementary Wood Physics</b>	<b>6.281</b>	<b>2</b>	<b>3</b>	<b>3</b>
This course is designed to acquaint the student with the basic physical and mechanical properties of wood as an engineering material. Various tests and testing methods are covered. Prerequisite: Practical Physics 4.300.				
<b>Elements of Design and Construction</b>	<b>2.418</b>	<b>0</b>	<b>4</b>	<b>2</b>
A comprehensive non-technical course given primarily for real estate licensees to familiarize them with building construction and materials, costs, building codes, terminology used in construction.				
<b>Engine Overhaul</b>	<b>4.184</b>	<b>3</b>	<b>12</b>	<b>6</b>
Engine overhaul deals with the recoprocating power systems and the necessary skills and procedures for reconditioning. Practical experience with machine tools and instruments related to these power plants will be provided in the laboratory. Included in the lab will be practical workshop experience. Theory and precautionary measures will be presented in the classroom. Various field visitations to enrich and clarify will be provided.				
<b>Engine Theory and Maintenance</b>	<b>4.291</b>	<b>2</b>	<b>4</b>	<b>3</b>
A continuation of the course Power Systems which will involve the student in a more detailed study of internal combustion engine performance. A study of Diesel Engines will be introduced concerning the operating and maintenance of such engines. Prerequisites: Power Systems 4.172 or approval of department head.				
<b>Engineering Soil Testing</b>	<b>6.344</b>	<b>2</b>	<b>3</b>	<b>3</b>
This course will emphasize the classification of soils, the function and behavior of the various soils, the soil tests used in typical engineering analysis, and the meaning of test results. The laboratory periods will be used to develop a familiarity with soil testing by actual performance of the various tests. Prerequisite: 2nd Year Standing or approval of department head.				
<b>Fabrication Problems</b>	<b>4.167</b>	<b>0</b>	<b>4</b>	<b>2</b>
An application of drafting and math courses to problems in fabrication of structural members, bins, hoppers, pipe fittings, chutes, etc. Principles and practices of pattern development for typical shapes and fittings are included. Prerequisites: Bench and Layout Practices, 4.810, Drafting 4.101, Mathematics 4.202 or approval of department head.				
<b>Finance, Contracts and Law</b>	<b>2.340</b>	<b>3</b>	<b>0</b>	<b>3</b>
A course designed to study the fields of Finance, Contracts, and the Civil Law as they pertain to the law, the contractor, equipment and the consumer.				
<b>Fire Apparatus and Equipment</b>	<b>5.102</b>	<b>2</b>	<b>2</b>	<b>3</b>
Familiarization with different types of fire apparatus; principles of application, care, and preventive maintenance; safe operating practices, emergency and non-emergency; National Board standards.				

		Lec.	Lab.	Term Units
<b>Fire Department Communications and Alerting Systems</b>	<b>5.115</b>	<b>3</b>	<b>0</b>	<b>3</b>
Receiving, dispatching and radio communication procedures; FCC regulations; municipal alarm; telephone and tone-activated alarm; recording messages; tap-out procedures, running cards, etc.				
<b>Fire Service Hydraulics</b>	<b>5.104</b>	<b>3</b>	<b>2</b>	<b>4</b>
Review of basic mathematics; hydraulic laws and formulas as applied to the fire service; application of formulas and mental calculations to hydraulic problems; fire ground water supply problems; Underwriter's requirements for pumps and accessories.				
<b>Fire Department Organization and Management</b>	<b>5.112</b>	<b>3</b>	<b>0</b>	<b>3</b>
Fire company and department organization and management; duties and responsibilities, response to alarms, public relations, fire prevention, records, reports, and communications. Basics of why and how various functions of administration are carried out; authority and responsibilities of command officers, chiefs, and elected officials.				
<b>Fire Fighting Skills</b>	<b>5.110</b>	<b>0</b>	<b>9</b>	<b>3</b>
Individual skills using small tools and minor equipment; practices in forcible entry, use of masks, salvage and overhaul, and different applications of small tools and minor equipment, safety practices.				
<b>Fire Fighting Skills</b>	<b>5.111</b>	<b>0</b>	<b>9</b>	<b>3</b>
Practice in team skills in various fire ground operations including hose and ladder evolutions, ventilation and coordinated attack simulation.				
<b>Fire Fighting Tactics and Strategy</b>	<b>5.113</b>	<b>3</b>	<b>0</b>	<b>3</b>
Pre-fire survey and planning; response and size-up; fire ground tactics; analysis and post-mortem.				
<b>Fire Investigation</b>	<b>5.117</b>	<b>3</b>	<b>2</b>	<b>4</b>
Effect on fire prevention by isolating cause of fire; interpreting clues and burn patterns leading to point of origin; identifying sources of ignition and materials ignited; preservation of the fire scene.				
<b>First Aid</b>	<b>5.513</b>	<b>1</b>	<b>0</b>	<b>1</b>
This course is designed to develop skills and knowledge for the immediate and temporary care in case of accident or sudden illness; preventive measures. This will be the standard Red Cross First Aid Course.				
<b>Fire Protection Systems and Extinguishers</b>	<b>5.106</b>	<b>3</b>	<b>0</b>	<b>3</b>
Portable extinguisher equipment; sprinkler system; protection systems for special hazards; fire detection systems; ventilating systems.				
<b>FM and HIFI Lab</b>	<b>4.271</b>	<b>0</b>	<b>3</b>	<b>1</b>
This lab consists of applying the principles studied in the theory course and the maintenance of FM and HIFI equipment. Basic record player units will be set up and checked out, serviced and lubricated and the cartridges studied and checked out.				
<b>FM and HIFI Theory</b>	<b>4.270</b>	<b>3</b>	<b>0</b>	<b>3</b>
In this course a study is made of the principles of FM receivers, the different kinds of FM detectors, the principles of multiplexing, the principles of HIFI, the operation of stereo sets, a study of HIFI amplifiers, the speaker systems.				

		Lec.	Lab.	Term Units
<b>Forest Mensuration</b>	<b>6.300</b>	<b>3</b>	<b>4</b>	<b>4</b>
This course is devoted to measuring the individual forest products and the standing tree in the forest. The student studies the various methods of timber cruising and puts this knowledge to work in actual field practice.				
<b>Forest Pathology</b>	<b>3.607</b>	<b>0</b>	<b>2</b>	<b>1</b>
A course designed to enable the student to recognize the common rots and stains found on logs and trees. The nature and extent of these wood-destroying fungi are studied with emphasis on those prevalent in Oregon and Washington.				
<b>Forest Products</b>	<b>4.280</b>	<b>3</b>	<b>3</b>	<b>4</b>
This course is designed to familiarize the student with the various forest products such as poles, piling, timbers, lumber, plywood, furniture, Particle board and other manufactured wood products. Emphasis is placed upon the properties, uses and the manufacturing processes.				
<b>Forest Products</b>	<b>4.281</b>	<b>3</b>	<b>3</b>	<b>4</b>
This course is designed to familiarize the student with the various chemical processes that convert wood and wood residues into pulp, cellulose, turpentine, charcoal and other products through chemical means.				
<b>Fortran Computer Programming</b>	<b>6.931</b>	<b>3</b>	<b>3</b>	<b>4</b>
Theory and practice in solving engineering and scientific data processing problems on modern digital computers. Principles of problem analysis, block diagramming, coding and checkout of programs.				
Prerequisite: Technical Mathematics 6.266.				
<b>Fuels and Lubricants</b>	<b>4.181</b>	<b>3</b>	<b>0</b>	<b>3</b>
Background and development of the fuel and lubricant industries and their operation, manufacturing procedures, marketing and distribution systems will be studied. The numerous products — both natural and synthetic — and their applications (special and general) to our modern industrial complex will be discussed. Stress will be placed on the importance of these products to our modern machine age, the conservation measures which must soon be applied in this area, and the alternatives which science is now developing.				
<b>Fundamentals of Exchanging</b>	<b>2.417</b>	<b>3</b>	<b>0</b>	<b>3</b>
The principles involved and practices followed in exchanging of real property for like property. Analyze tax situations involved, and advantages accruing from certain exchanges.				
Prerequisite: Real Estate Principles 2.400 and 2.410.				
<b>Fundamentals of Fire Prevention</b>	<b>5.101</b>	<b>3</b>	<b>0</b>	<b>3</b>
Organization and function of a fire prevention bureau; fire prevention codes; state and local laws and ordinances; familiarization with principles of fire prevention; the inspector's job; public relations.				
<b>Fundamentals of Real Estate Taxation</b>	<b>2.416</b>	<b>3</b>	<b>0</b>	<b>3</b>
An advanced and intensive study of tax principles governing the acquisition, ownership, operation, and disposition of real property with special emphasis on tax planning, and integration of tax concepts with procedural aspects.				
Prerequisite: Real Estate Principles 2.400 and 2.410.				

		Lec.	Lab.	Term Units
<b>General Forestry</b>	<b>3.600</b>	<b>3</b>	<b>0</b>	<b>3</b>

This course presents an orientation and over-all picture of forestry in the United States. It includes how forests and man are interdependent; the role of forests in the building of our country; the distribution and character of our forests; what a forest and forestry are; silvicultural systems; reforestation and the history of forest protection as related to fire, insects, animals and disease.

<b>Geodetic Surveying</b>	<b>6.343</b>	<b>2</b>	<b>2</b>	<b>3</b>
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This course is designed to acquaint the student with the basic principles of geodetic surveying. The material is presented in such a manner as to lead the student to a more complete understanding of the principle involved.

<b>Geometric Construction</b>	<b>4.120</b>	<b>1</b>	<b>1</b>	<b>1</b>
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A course designed to develop an understanding of the basic geometric construction used in drafting. Laboratory time is provided for practice of construction and application of concepts.

<b>Group Process</b>	<b>5.530</b>	<b>3</b>	<b>0</b>	<b>3</b>
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The dynamics of human behavior in group process; concepts applied to group and family action; and the basic concept and generalization of group dynamics.

<b>Hazardous Materials</b>	<b>5.108</b>	<b>3</b>	<b>0</b>	<b>3</b>
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Review of basic chemistry; safe practices for storage and handling of flammable liquids, and gases; identification of hazardous materials by color, symbol, and marking; recommended methods for fire control.

<b>Hazardous Materials</b>	<b>5.109</b>	<b>3</b>	<b>0</b>	<b>3</b>
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Tactics for combating fires involving hazardous chemicals and other materials; radiation hazards of the fire service; space age fuel; highway transportation, explosives, etc.

<b>Health Occupations Overview</b>	<b>5.700</b>	<b>1</b>	<b>0</b>	<b>1</b>
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Concepts underlying the health field; health services and resources in the community; the role of the health worker as member of the health team.

<b>Highway Design</b>	<b>6.554</b>	<b>2</b>	<b>6</b>	<b>4</b>
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This course takes a highway design from inception through final drafting. Using knowledge acquired in previous courses, the student will design a section of highway with consideration given to safety, drainage, material requirements, and associated costs.

<b>Hydraulics</b>	<b>6.112</b>	<b>2</b>	<b>2</b>	<b>3</b>
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The first course in the study of hydraulics covers the fundamental properties of fluids, principles of hydrostatic pressure — including Pascal's Law, the hydrostatic 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: Fifth term standing or approval of department head.

		Lec.	Lab.	Term Units
<b>Hydraulics</b>	<b>6.114</b>	<b>2</b>	<b>2</b>	<b>3</b>
<p>Consists of the fundamentals of fluid flow, Bernoulli's 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 demonstrations and experiments to help clarify the principles and procedures covered in class.</p> <p>Prerequisite: Hydraulics 6.112 or equivalent.</p>				
<b>Hydraulic and Pneumatic Systems</b>	<b>4.173</b>	<b>2</b>	<b>3</b>	<b>3</b>
<p>The course is designed to provide instruction in the fundamental principles of hydraulic and pneumatic systems. The course includes study of the basic components of hydraulic and pneumatic systems and how they are combined to build up various circuits and ultimate use of these circuits. The student will learn the factors to be considered in the selection, installation and maintenance of hydraulic and pneumatic systems.</p> <p>Prerequisites: Mathematics 4.202 and Mechanical Systems or approval of department head.</p>				
<b>Hydraulics For Drillers</b>	<b>4.294</b>	<b>3</b>	<b>2</b>	<b>4</b>
<p>A study of hydraulics pertaining to water wells, including water table studies, cone of depression and areas of influence; factors affecting quality flow; well sizes and well development will also be studied.</p>				
<b>Industrial Construction Drafting</b>	<b>4.133</b>	<b>2</b>	<b>6</b>	<b>4</b>
<p>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 industrial 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.</p> <p>Prerequisite: Fifth term standing or approval of department head.</p>				
<b>Industrial Construction Drafting</b>	<b>4.137</b>	<b>2</b>	<b>6</b>	<b>4</b>
<p>Continuation of the industrial construction processes with emphasis on bridge and tower construction, plant layout, field drawings, revisions, and piping drawings. Laboratory time is used to develop typical drawings requiring application of principles discussed.</p> <p>Prerequisite: Fifth term standing or approval of department head.</p>				
<b>Industrial Electronics</b>	<b>6.218</b>	<b>3</b>	<b>3</b>	<b>4</b>
<p>An introductory class and laboratory course covering the principles and applications of electronics in industry. Involves a review of the principles of D-C motor controls with emphasis on electronic controls. Also covers relays and time-relay circuits; industrial photo-electric control and typical applications; electronic power-control with saturable core reactors and the amplidyne; and electronic control of welding.</p> <p>Prerequisite: Amplifier Circuit and Design.</p>				
<b>Industrial Instrumentation</b>	<b>6.253</b>	<b>2</b>	<b>3</b>	<b>3</b>
<p>A study dealing with pneumatic, hydraulic and electrical instruments and measurements for temperature, pressure flow and related phenomena. Employing many of the principles and laws of physics. The laboratory classes demonstrate and apply the ideas brought forth in theory sessions.</p>				

		Lec.	Lab.	Term Units
<b>Industrial Instrumentation</b>	<b>6.254</b>	<b>2</b>	<b>3</b>	<b>3</b>

A further study of pneumatic hydraulic and electrical instruments and measuring devices, as they apply to process and control systems. The laboratory classes demonstrate and apply the ideas brought forth in theory sessions.

<b>Industrial Materials and Processes</b>	<b>4.170</b>	<b>2</b>	<b>4</b>	<b>3</b>
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A course designed to familiarize the student with the materials used by modern industry to manufacture industrial products. The ferrous and non-ferrous metals and alloys are covered as well as a number of the newly developed "exotic" metals. Emphasis is placed on the non-metallic materials used in industry. Included in the course are the study of the processes and methods of utilizing these industrial materials. From time to time industrial consultants are brought into the laboratory to orient the student to the application of industrial materials and processes in their firms.

Prerequisites: Machine Tool Processes 4.802. Welding 4.150 concurrently or approval of department head.

<b>Industrial Safety</b>	<b>4.108</b>	<b>3</b>	<b>0</b>	<b>3</b>
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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.

<b>Industrial Television</b>	<b>6.228</b>	<b>3</b>	<b>6</b>	<b>5</b>
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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 reinsertions video detection automatic gain-control and sync-separation, and deflection oscillator and amplifier circuits.

<b>Industrial Television</b>	<b>6.235</b>	<b>3</b>	<b>3</b>	<b>4</b>
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A theory and lab course designed to cover 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.

<b>Industry Internship</b>	<b>3.622</b>	<b>0</b>	<b>40</b>	<b>16</b>
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This term will be spent on the job with a scaler. Work experience will be evaluated for credit.

<b>Inert Gas Welding</b>	<b>4.163</b>	<b>1</b>	<b>3</b>	<b>2</b>
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A course in fundamentals on tungsten inert gas welding processes, machine setting and application.

Prerequisites: Electric Arc Welding 4.160; Oxyacetylene Welding 4.161.

<b>Intermediate Arc Welding</b>	<b>4.241</b>	<b>2</b>	<b>12</b>	<b>5</b>
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This is a continuation of Basic Arc Welding covering ferrous and non-ferrous alloys and welding procedures. Demonstration and supervised practice of techniques on various metals, applied in fabrication and repair will run concurrently with related information concerning the use and structure of these metals.

		Lec.	Lab.	Term Units
<b>Intermediate Electric Accounting Machine Applications</b>	<b>8.945</b>	<b>3</b>	<b>3</b>	<b>4</b>
This course expands concepts presented in Introduction to Electric Accounting Machines Applications 6.944. However, the emphasis is placed on the preparation of formal operating procedures. The applications used are such that all electric accounting machines in the laboratory will be included in the operating procedures.				
Prerequisites: Technical Report Writing 6.126 and Introduction to Electric Accounting Machines 6.913.				
<b>Intermediate Electric Accounting Machine Operations</b>	<b>6.942</b>	<b>2</b>	<b>6</b>	<b>4</b>
A continuation of Electric Accounting Machines Operations and is designed to develop more skill and confidence in the student by operating unit record procedures.				
Applications performed during this course may include students records, personnel accounting, payroll accounting and school census rolls. Machine control panel wiring will be performed by the students on selected applications.				
Prerequisites: Introduction to Electric Accounting, Machine Operations 6.941.				
<b>Intermediate Oxy-Acetylene Welding</b>	<b>4.243</b>		<b>8</b>	<b>2</b>
This is a continuation of Basic Oxy-Acetylene Welding covering ferrous and non-ferrous alloys and welding procedures. Demonstrations and supervised practice in heating, hard and soft soldering, brazing, hard surfacing, etc., will run concurrently with technical and related information concerning materials and features of various fused and bonded joints. This course is designed to complete a thorough preparation and familiarization with the oxy-acetylene flame as used in industry.				
<b>Introduction to Automatic Data Processing</b>	<b>6.900</b>	<b>3</b>	<b>2</b>	<b>4</b>
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.				
<b>Introduction to Basic Procedures</b>	<b>5.411</b>	<b>2</b>	<b>3</b>	<b>3</b>
This course is designed to give the student basic knowledge and practical experience in all of the general dental office procedures including seating and dismissing patients, charting cavities, making basic set-ups for general operative procedures, and acquaint the student with the dental assisting curriculum and the qualifications necessary for success in that field.				
<b>Introduction to Business and Public Administration</b>	<b>2.502</b>	<b>3</b>	<b>0</b>	<b>3</b>
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.				

		Lec.	Lab.	Term Units
<b>Introduction to Electric Accounting Machines</b>	<b>6.913</b>	<b>3</b>	<b>3</b>	<b>4</b>

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.

<b>Introduction to Electric Accounting Machine Applications</b>	<b>6.944</b>	<b>3</b>	<b>2</b>	<b>4</b>
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This course places emphasis on the study and design of unit record accounting systems for customer vendor accounting. The student will be introduced to accounting systems used by business and industries which may include public utilities, service organizations, manufacturers, merchandising, publishing, transportation and banking.

Prerequisites: Introduction to Electric Accounting Machines 6.913 or approval of department head.

<b>Introduction to Electric Accounting Machine Operations</b>	<b>6.941</b>	<b>2</b>	<b>6</b>	<b>4</b>
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Intensive study and practice in the operation of electric accounting machines and control panel wiring. The machine operations are learned while processing and solving typical machine accounting applications, i.e., accounts receivable, accounts payable and sales analysis.

Prerequisites: Introduction to Electronic Accounting Machines 6.913 or approval of department head.

<b>Introduction to Fabrication Practices</b>	<b>4.100</b>	<b>2</b>	<b>7</b>	<b>4</b>
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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 of local industry. Emphasis will be placed on materials, methods of fabrication, glossary, scaling for drawing, and visualization of fabricated objects or assemblies.

<b>Introduction to Fire Protection</b>	<b>5.100</b>	<b>3</b>	<b>0</b>	<b>3</b>
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Philosophy and history of fire protection, history of loss of life and property by fire; role and responsibility of the fire department in the community; organization and function of local, county, state, federal and private fire protection agencies and allied organizations; sources of professional literature; survey of professional career opportunities.

<b>Introduction to Mapping</b>	<b>4.132</b>	<b>1</b>	<b>7</b>	<b>3</b>
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This course is designed to acquaint the student with the basic principles of map construction and uses. The material is presented in such a manner so as to lead the student to an understanding of the basic principles of map drafting.

		Lec.	Lab.	Term Units
<b>Introduction to Medical Assisting</b>	<b>5.600</b>	<b>3</b>	<b>0</b>	<b>3</b>

This course gives an introduction to the professional health services and the function of the assistant as a member of the health team. It will include a review of the requirements and qualities necessary for success in this field: personal appearance and grooming, conduct and attitude, professional and patient relationships. The legal relationship of physician and patient, professional liability, the physician's public duties and liabilities, types of medical practice, systems of medical care, bases for determining fees, health and accident insurance programs, and government medical care programs will be studied.

<b>Introduction to Specifications</b>	<b>4.102</b>	<b>3</b>	<b>0</b>	<b>3</b>
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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.

<b>Introduction to Systems and Procedures</b>	<b>6.902</b>	<b>3</b>	<b>0</b>	<b>3</b>
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Procedures as a basic administrative technique. The principles of organizing, planning and administering a procedure program. Methods of carrying out individual systems and procedure studies. Procedures analysis and improvement techniques, the role of systems and procedures in business management, systems charting, working simplification and measurement.

<b>Jig and Fixture Drafting</b>	<b>4.231</b>	<b>0</b>	<b>8</b>	<b>3</b>
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This is an advanced course in the area of tool drafting. In the lab work the student will use his ingenuity in the design and detailing of jigs and fixtures to perform a variety of machining operations. The adaption of common machine tools to high speed and high precision production is the main objective of this type of design.

Prerequisite: Sixth term standing in Technical Drafting or consent of drafting department head.

<b>Job Machining Practices</b>	<b>4.845</b>	<b>3</b>	<b>12</b>	<b>7</b>
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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.

Prerequisites: Advanced Lathe Practices 4.833, Advanced Milling Machine Practices 4.837, Metal Fabrication and Finishing 4.174.

<b>Land Division and Mapping</b>	<b>6.335</b>	<b>1</b>	<b>5</b>	<b>3</b>
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This course is designed to introduce the student to the basic principles of map layout and methods of platting with special regards to the division of land, route design and cadastral surveys.

<b>Layout Practices</b>	<b>4.245</b>	<b>2</b>	<b>3</b>	<b>3</b>
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This is a course on layout tools and their use in fabricating structural members, bins, hoppers, pipe fittings, chutes, etc. Principles and practices of pattern development for typical forms and fittings will be included.

		Lec.	Lab.	Term Units
<b>Light Gauge Welding</b>	<b>4.249</b>	<b>2</b>	<b>3</b>	<b>3</b>

This course is designed to be a review and application of the welding, layout and fabrication processes covered during the year, as applied to the joining of various light gauge metals. Also it will cover resistance welding and a comparative study of metal joining processes in terms of costs and function of the product. Field trips will be arranged to illustrate industrial practices.

Prerequisites: Successful completion of the previous courses and concurrent registration in Tungsten Inert Gas Welding and Metallic Inert Gas Welding courses.

<b>Logging and Milling</b>	<b>4.282</b>	<b>2</b>	<b>6</b>	<b>3</b>
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A course designed to acquaint the student with the harvesting and transportation of logs, and the manufacturing processes and machines in the lumber industry.

<b>Machine Design</b>	<b>4.603</b>	<b>3</b>	<b>2</b>	<b>4</b>
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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.

<b>Machine Drafting</b>	<b>4.221</b>	<b>0</b>	<b>5</b>	<b>2</b>
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This is an introductory course in the general area of machine drafting. Lettering, the use of drafting machines and instruments, and line quality will be stressed in this course. Shape description and elements of modern dimensioning will be taught through the application of problems in the area of orthographic projections, section views, and auxiliary views.

<b>Machine Drafting</b>	<b>4.222</b>	<b>0</b>	<b>5</b>	<b>2</b>
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This is a continuation of Machine Drafting. Lettering, line quality, and drafting techniques will continue to be stressed. Areas of study will include the application on precision dimensioning, secondary auxiliary, isometric drawing, and related pictorial drawings.

Prerequisite: Machine Drafting 4.221.

<b>Machine Drafting</b>	<b>4.223</b>	<b>0</b>	<b>5</b>	<b>2</b>
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This is a continuation of Machine Drafting. Lettering, line quality, and drafting techniques will continue to be stressed. Areas of study will include revolutions, assembly and production drawings, and an introduction to engineering graphics.

Prerequisite: Machine Drafting 4.222.

<b>Machine Shop Automation</b>	<b>4.824</b>	<b>2</b>	<b>0</b>	<b>2</b>
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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.

Prerequisites: Mathematics 4.202, Machine Tool Processes 4.804 or approval of department head.

		Lec.	Lab.	Term Units
<b>Machine Shop Practices</b>	<b>4.841</b>	<b>3</b>	<b>6</b>	<b>5</b>
<p>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.</p> <p>Prerequisites: Bench and Layout Practices 4.810, Machine Tool Processes 4.806, Mathematics 4.204, Drafting 4.101.</p>				
<b>Machine Shop Problems</b>	<b>4.820</b>	<b>3</b>	<b>0</b>	<b>3</b>
<p>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.</p>				
<b>Machine Tool Processes</b>	<b>4.802</b>	<b>2</b>	<b>3</b>	<b>3</b>
<p>A basic machine tool operations course. Introducing the student to the principles involved in the operation of the basic machine tools, engine lathe, shaper, drill press, grinder, and milling machine.</p>				
<b>Machine Tool Processes</b>	<b>4.804</b>	<b>2</b>	<b>3</b>	<b>3</b>
<p>A continuation of the basic course Machine Tool Operations 4.802 involving typical setup and machining operations.</p>				
<b>Machine Tool Processes</b>	<b>4.806</b>	<b>2</b>	<b>3</b>	<b>3</b>
<p>A continuation of the Machine Tool Processes sequence. Introducing the student to production methods, inspection and quality control, generally increasing the student's understanding of common industrial practices.</p> <p>Prerequisite: Machine Tool Processes 4.804 or approval of department head.</p>				
<b>Manufacturing Processes</b>	<b>6.606</b>	<b>2</b>	<b>3</b>	<b>3</b>
<p>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.</p>				
<b>Manufacturing Processes</b>	<b>6.610</b>	<b>2</b>	<b>3</b>	<b>3</b>
<p>This course is designed to provide a background of knowledge covering the various casting and foundry practices. Through lectures, demonstrations and discussion 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.</p>				
<b>Mapping and Computing</b>	<b>6.350</b>	<b>1</b>	<b>5</b>	<b>3</b>
<p>This course is designed to introduce the student to the basic principles of map layout and methods of platting. The material is presented in such a manner so as to lead the student to a more complete understanding of the techniques of map drafting.</p>				

		Lec.	Lab.	Term Units
<b>Mapping and Computing</b>	<b>6.351</b>	<b>1</b>	<b>5</b>	<b>3</b>

This course is designed to advance the student into more difficult problems in mapping and subdivision design with consideration given to federal, state, and local laws and codes governing the surveyor and the division of lands, public and private. The student will be trained in the theories used to determine true meridian and time for accurate location of points on the earth's surface.

<b>Mapping and Computing</b>	<b>6.352</b>	<b>1</b>	<b>5</b>	<b>3</b>
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This course is designed to acquaint the student with the methods and instruments involved in topographic mapping and surveying with emphasis on a higher degree of accuracy and mapping problems. The material is presented in such a manner so as to lead the student to a complete understanding of topographic mapping and survey.

<b>Mapping and Platting</b>	<b>4.131</b>	<b>1</b>	<b>7</b>	<b>3</b>
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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.

<b>Maternal and Child Health</b>	<b>5.702</b>	<b>4</b>	<b>12</b>	<b>8</b>
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The study and practice of maternal and child health, based on *family-centered nursing*, incorporates normal health processes occurring in mothers during the maternity cycle, and in the children from birth through adolescence. The abnormal health processes are emphasized only as they enable the student to understand the normal.

<b>Mechanical Drafting</b>	<b>4.109</b>	<b>0</b>	<b>4</b>	<b>2</b>
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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 department head.

<b>Mechanical Systems</b>	<b>4.171</b>	<b>3</b>	<b>3</b>	<b>4</b>
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A course designed to familiarize the student with the transfer of power methods, used by industry and industrial products, with relation to the basic laws of physics. Particular emphasis is placed on the general types of mechanical equipment used, the purpose of the components and the maintenance requirements of the equipment.

Prerequisites: Practical Physics 4.300, Mathematics 4.204 concurrently, or approval of department head.

<b>Mechanisms</b>	<b>6.612</b>	<b>3</b>	<b>3</b>	<b>4</b>
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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. Centroids 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.

Prerequisite: Tech. Math 6.266, Physics 6.370 or approval of department head.

		Lec.	Lab.	Term Units
<b>Mechanisms</b>	<b>6.613</b>	<b>3</b>	<b>3</b>	<b>4</b>

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 ratches, pantographs, valves, clutches and universal joints.

Prerequisite: Mechanisms 6.612.

<b>Medical Assisting, Advanced Procedures</b>	<b>5.606</b>	<b>2</b>	<b>16</b>	<b>4</b>
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This course is a continuation of medical assisting and includes emergency care in a medical office or clinic and a laboratory orientation. It will provide the basic theoretical knowledge of the most frequently used laboratory procedures, with emphasis on proper preparation of the patient and properly collected or prepared specimens. Assignments are made to medical offices for clinical experience.

<b>Medical Assisting, Basic Procedures</b>	<b>5.602</b>	<b>2</b>	<b>6</b>	<b>4</b>
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This course is designed to provide basic training in the various types of technical work performed by medical office, clinic, and hospital personnel, including receptionist duties and assisting the physician with examinations and treatments. Emphasis will be placed on proper psychological and physical preparation of the patient for the physician's examination and the accurate determination of such data as temperature and pulse rate. It will include laboratory work in techniques of sterilization, tray set-ups, use of instruments, care and maintenance of equipment.

<b>Medical Office Management</b>	<b>5.607</b>	<b>3</b>	<b>0</b>	<b>3</b>
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This course is designed to prepare the medical assistant to handle finances and records with accuracy and efficiency and to provide an understanding of accounting, credits, and collection that will facilitate working with accountants, auditors, and collection agencies in maintenance of good records. It will include a study of typical recording activities and systems in medical offices.

<b>Medical Office Procedures</b>	<b>5.604</b>	<b>2</b>	<b>3</b>	<b>3</b>
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This course consists of instruction in techniques of telephoning, receiving patients, appointment making, filing, medical insurance forms, medical office transcriptions, and correspondence.

<b>Medical Science</b>	<b>5.605</b>	<b>2</b>	<b>0</b>	<b>2</b>
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This course is designed to acquaint the student with various medical diseases, surgical and orthopedic conditions. Also it will include an overall study of specialists—diplomates, allergists, gynecologists, obstetricians, neurologists, psychiatrists, ophthalmologists, and others.

<b>Metal Fabrication and Finishing</b>	<b>4.174</b>	<b>2</b>	<b>4</b>	<b>3</b>
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A course designed to develop the concept of the production sequence of a completed part or machine from the fabrication and assembly processes to and including heat treating and final finishing. The student will perform the procedure step by step in proper sequence, utilizing knowledge acquired in previous courses.

Prerequisites: Drafting 4.105, Machine Tool Processes 4.806, Welding 4.150, Industrial Materials and Processes 4.170.

		Lec.	Lab.	Term Units
<b>Metallic Inert Gas Welding</b>	<b>4.248</b>	<b>1</b>	<b>3</b>	<b>2</b>

A course designed to develop a basic familiarity and basic skills in semi-automatic welding. A study of the principles involved in the equipment, materials, and procedures will be combined with demonstrations and supervised practice using standard industrial equipment. Solid and flux cored electrode wires will be used in typical industrial applications.

Prerequisites: Basic Arc Welding 4.240 or Welding 4.150 or approval of department head.

<b>Metallurgy</b>	<b>6.602</b>	<b>2</b>	<b>3</b>	<b>3</b>
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This course covers principles relating to metals, structures and physical properties. The uses, heat treatments, and testing of various metals are explored. Laboratory time is provided for demonstrations and experiments to aid classroom studies.

<b>Methods of Supervision</b>	<b>4.287</b>	<b>3</b>	<b>0</b>	<b>3</b>
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This course is designed to develop the student's knowledge in the techniques of supervision. The course will cover all aspects of supervision such as leadership, organization, communications, morale, job analysis, job training, accident prevention, planning time studies, cost analysis, etc.

Prerequisite: Psychology of Human Relations 1.608.

<b>Microwaves</b>	<b>6.242</b>	<b>2</b>	<b>3</b>	<b>3</b>
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A theory and laboratory course designed as an introduction to microwaves. Theoretical and practical approach to X band techniques of measurements are emphasized. Waveguide elements and components, frequency measurement devices, ferrite devices, and active microwave devices are studied. Transmission of energy from generator to receiver in a practical mw communication system serves as the outline of the course presentation.

Prerequisite: Antenna and Transmission Lines 6.231.

<b>Natural Cover Fire Protection</b>	<b>5.151</b>	<b>3</b>	<b>2</b>	<b>4</b>
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The organization, methods, tactics, and strategy of safely controlling and extinguishing grass, brush, and forest fires; use of hand tools, portable pumps, motorized apparatus, aircraft and helicopters, chemicals, and other related equipment used in the suppression of natural cover fires; forest and wildland fire prevention programs.

<b>Network Analysis</b>	<b>6.230</b>	<b>2</b>	<b>0</b>	<b>2</b>
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A course to develop new techniques and concepts in mastering problems encountered in design and maintenance of electronic circuits. Field theory is utilized. The concept of admittance is used in mathematical and graphical solutions.

<b>Nursing: Fundamentals</b>	<b>5.701</b>	<b>3</b>	<b>12</b>	<b>7</b>
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The course is designed to develop understanding of technical nursing and to provide a foundation for nursing practice. The rationale for the course is to introduce the student to nursing practice based on meeting basic health needs of patients.

<b>Nursing: Long Term Illness</b>	<b>5.703</b>	<b>4</b>	<b>12</b>	<b>8</b>
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Meeting the basic needs of children and adults with long term illness; nursing care during the rehabilitative process; caring for patient with metabolic disorders, limited motion handicaps, audio-visual handicaps and neurological handicaps.

		Lec.	Lab.	Term Units
<b>Nursing: Short Term Illness</b>	<b>5.704</b>	<b>4</b>	<b>12</b>	<b>8</b>
Meeting the basic and therapeutic needs of children and adults with acute or short term illness. Nursing care during the acute or short term illness; caring for patients with commonly occurring gastrointestinal conditions, cardiovascular conditions, renal conditions, respiratory conditions, neoplastic diseases and communicable diseases.				
<b>Nursing: Mental Illness and Mental Retardation</b>	<b>5.705</b>	<b>4</b>	<b>15</b>	<b>9</b>
Meeting the basic needs of children and adults with mental illness and mental retardation. Nursing care of patients with patterns of withdrawal, depression patterns, anxiety reaction patterns, antisocial patterns, behavior patterns expressed through the use of alcohol and drugs, and mental retardation.				
<b>Nursing Trends and Practices</b>	<b>5.720</b>	<b>2</b>	<b>0</b>	<b>2</b>
Survey of nursing history and a study of the present role of nursing as a profession in the promotion of individual, family and community health. Designed to establish a base for further study of nursing.				
<b>Nutrition for Health Occupations</b>	<b>5.430</b>	<b>1</b>	<b>2</b>	<b>2</b>
A study of normal nutrition, emphasizing the major nutrients and their application of daily diets accounting for variations due to factors of age and other normal changes throughout life. It includes principles and practice in food preparation, food service, and family food planning.				
<b>Office Procedures</b>	<b>2.641</b>	<b>2</b>	<b>2</b>	<b>3</b>
Emphasis will be on duties involved in handling of office supplies, handling of mail and other transmittal services, using telephone and telegraph facilities, using information sources, and preparing office records and reports. Office relations and job application will be stressed.				
<b>Oscillator Circuits and Design</b>	<b>6.225</b>	<b>2</b>	<b>6</b>	<b>4</b>
A continuation of amplifier circuits and design. 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-sinusoidal 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: Amplified Circuits and Design 6.216 or approval of department head.				
<b>Oxyacetylene Welding</b>	<b>4.161</b>	<b>1</b>	<b>3</b>	<b>2</b>
A course in fundamentals on oxyacetylene welding, introducing brazing and cutting processes.				
Prerequisite: Welding 4.150.				
<b>Personal Development</b>	<b>2.518</b>	<b>1</b>	<b>1</b>	<b>1</b>
A course designed to help assist the woman develop her full potential in her chosen vocation. The course will include aspects of posture, poise, personality, wardrobe planning, and care of clothing in preparation for the field of work.				

		Lec.	Lab.	Term Units
<b>Photo Interpretation and Mapping</b>	<b>4.112</b>	<b>3</b>	<b>4</b>	<b>4</b>
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 department head.				
<b>Pictorial Drafting</b>	<b>4.149</b>	<b>0</b>	<b>3</b>	<b>1</b>
A concentrated study of the development of pictorial 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 department head.				
<b>Plane Surveying</b>	<b>6.101</b>	<b>2</b>	<b>6</b>	<b>4</b>
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.				
<b>Plane Surveying</b>	<b>6.103</b>	<b>2</b>	<b>6</b>	<b>4</b>
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.				
Prerequisites: Plane Surveying 6.101 and Tech. Math. 6.261 or equivalent.				
<b>Power Systems</b>	<b>4.172</b>	<b>3</b>	<b>4</b>	<b>4</b>
A course designed to familiarize the student with the operation, maintenance and minor repair of 2 cycle and 4 cycle gasoline and diesel engines and to provide for learning the proper procedures in making minor service adjustments and repairs to these units. Through laboratory and classroom experiences the student will gain knowledge of the theory of operation and will have an opportunity to study the component parts of these engines.				
Prerequisite: Practical Physics concurrently, or approval of department head.				
<b>Practical Hydrology</b>	<b>6.535</b>	<b>3</b>	<b>0</b>	<b>3</b>
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 department head.				
<b>Practical Nursing</b>	<b>5.520</b>	<b>5</b>	<b>12</b>	<b>9</b>
The major objectives of this course are to: identify basic human needs based on Maslow's hierarchy of needs; collect data necessary for planning nursing care; plan nursing care by assessing patient's need for assistance with daily activities; assist patient in carrying out his daily activities as needed; provide conditions that promote fulfillment of patient needs, seeking assistance when needed from appropriate source; utilize science principles in giving direct patient care; and evaluate care given, record observations and action, and report unusual findings.				
<b>Practical Nursing</b>	<b>5.521</b>	<b>2</b>	<b>21</b>	<b>9</b>
The major objectives of this course are to: identify common problems in nursing situations; solve common nursing problems using previously learned methods; test working hypothesis through intervention when appropriate; and evaluate care given, modifying patient care plan as needed.				

		Lec.	Lab.	Term Units
<b>Practical Nursing</b>	<b>5.522</b>	<b>2</b>	<b>21</b>	<b>9</b>

The major objectives of this course are to: identify common diseases; describe common disease conditions; utilize learnings in practical nurse program to plan, give, and evaluate nursing care of select patients with common disease conditions; assist the registered nurse with complex nursing situations; and make preparation for assuming role of graduate practical nurse.

<b>Production Planning and Practices</b>	<b>4.104</b>	<b>3</b>	<b>2</b>	<b>4</b>
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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 department head.

<b>Programming</b>	<b>6.935</b>	<b>3</b>	<b>3</b>	<b>4</b>
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Theory and practice in solving business data processing problems on modern digital computers. Principles of problem analysis, block diagramming, coding and checkout of programs.

<b>Programming</b>	<b>6.936</b>	<b>3</b>	<b>6</b>	<b>4</b>
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Theory and practice in solving advanced business data processing problems on modern digital computers. Principles of problem analysis, block diagramming, coding and checkout of programs.

<b>Programming</b>	<b>6.937</b>	<b>3</b>	<b>6</b>	<b>4</b>
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Practice in programming with emphasis on methods of generalized programs; sorting, report generating, table look-up, and program testing.

Prerequisite: Programming 6.936 or approval of department head.

<b>Programming</b>	<b>6.938</b>	<b>3</b>	<b>6</b>	<b>4</b>
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A continuation of Programming 6.937 with emphasis on automatic programming systems such as COBOL, algebraic compilers, floating point arithmetic, introduction to scientific programming.

Prerequisite: Programming 6.937 or approval of department head.

<b>Project Drafting</b>	<b>4.119</b>	<b>1</b>	<b>9</b>	<b>4</b>
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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 drafting room, issuing drawings and revisions. Speed and accuracy will be considered of paramount importance.

Prerequisite: Drafting 4.105 which may be taken concurrently.

<b>Project Drafting</b>	<b>4.121</b>	<b>0</b>	<b>8</b>	<b>3</b>
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A continuation of the emphasis on industrial working conditions. Students 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 take-offs. 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.

		Lec.	Lab.	Term Units
<b>Project Drafting</b>	<b>4.145</b>	<b>1</b>	<b>9</b>	<b>4</b>
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 specifications and design, checking and back-checking methods, revisions, material take-offs, and different methods representing circuit and circuit components.				
Prerequisite: Sixth Term standing or approval of department head.				
<b>Property Management</b>	<b>2.422</b>	<b>1</b>	<b>3</b>	<b>2</b>
A study of the business practices and principles of managing the property of others for a fee. Includes such factors as maintenance and repairs, personnel supervision.				
Prerequisite: Real Estate Principles 2.400 and 2.410.				
<b>Property of Materials</b>	<b>6.341</b>	<b>1</b>	<b>3</b>	<b>2</b>
A course designed to acquaint the student with the physical and mechanical properties of common engineering materials. Using a variety of testing methods, gathering and compiling data.				
<b>Pump Operation and Practical Hydraulics</b>	<b>5.105</b>	<b>2</b>	<b>2</b>	<b>3</b>
Principles of fire apparatus pumping operations; fire ground water supply; construction and operation of fire service pumps and accessories; pump operation under emergency conditions; rule of thumb hydraulics.				
<b>Quality Control of Wood Products 6.285</b>		<b>1</b>	<b>6</b>	<b>3</b>
This course is designed to give the student a practical working knowledge of the quality control methods and the ability to perform various quality control tests as used in the industry. Areas covered include lumber, plywood, particle board, hardboard, pulp and paper, etc.				
<b>Quality Control of Wood Products 6.287</b>		<b>1</b>	<b>6</b>	<b>3</b>
This course is a continuation of Quality Control of Wood Products 6.285. The subject matter is continued in greater depth.				
Prerequisite: Quality Control of Wood Products 6.285.				
<b>Radio Law</b>	<b>6.252</b>	<b>2</b>	<b>0</b>	<b>2</b>
The principles of rules and regulations necessary to receive a Radio-Telephone 1st or 2nd Class License.				
<b>Radio Principles</b>	<b>4.262</b>	<b>2</b>	<b>0</b>	<b>2</b>
A study of the circuits and components which go to make up a radio. The principles of how and why they operate with studies of individual circuit problems in both vacuum tube and transistor radios.				
<b>Radio Principles Lab.</b>	<b>4.263</b>	<b>0</b>	<b>6</b>	<b>2</b>
A laboratory course covering the principles covered in the Radio Principles classes. The student will build up bread board models of the circuits for analysis and components will be changed to show the effects of these changes.				
<b>Radio Servicing</b>	<b>4.264</b>	<b>2</b>	<b>0</b>	<b>2</b>
The study of overall radio circuits and the problems of these circuits. Service techniques, procedures and case histories are studied. The radios are broken into basic types for study and each type analyzed as to their own peculiar characteristics.				

		Lec.	Lab.	Term Units
<b>Radio Servicing Lab.</b>	<b>4.265</b>	<b>0</b>	<b>6</b>	<b>2</b>

An application of the materials covered in the Radio Servicing theory class. Some circuits are bread boarded for analysis and the rest of the time is spent on actual receivers doing voltage measurements, resistance measurements, circuit tracing, alignment and general circuit analysis. Trouble is installed in the radios to simulate actual field conditions.

<b>Radio Transmitters</b>	<b>6.250</b>	<b>3</b>	<b>3</b>	<b>4</b>
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A practical analysis of transmitter operation and transmitter circuitry, accompanied by a laboratory session where practical application of theory and trouble shooting techniques are applied.

<b>Real Estate Appraisal</b>	<b>2.408</b>	<b>2</b>	<b>3</b>	<b>3</b>
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Theories, functions and purposes of appraisal. Residential, income property and land appraisal; principles of valuation, including cost, market and income approach; techniques for determining condemnation, insurance, loan, purchase and sales values.

Prerequisite: Real Estate Principles 2.400 and 2.410.

<b>Real Estate Appraisal</b>	<b>2.409</b>	<b>2</b>	<b>3</b>	<b>3</b>
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Continuation of Real Estate Appraisal 2.408 with emphasis on specific problem areas such as commercial appraisals, farm appraisals, industrial appraisals.

Prerequisite: Real Estate Appraisal 2.408.

<b>Real Estate Counseling</b>	<b>2.440</b>	<b>5</b>	<b>0</b>	<b>5</b>
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A case study approach to the problems of counseling with clients on real estate purchases, exchanges, speculation, and investment.

Prerequisite: 6th Term Standing.

<b>Real Estate Finance</b>	<b>2.406</b>	<b>3</b>	<b>0</b>	<b>3</b>
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Policies, problems and risks involved in financing and investing in various types of real property. Includes analysis of taxation, exchanges, sources of loan funds, institutional and government policies, and instruments and methods of loan processing.

Prerequisite: Real Estate Principles 2.400 and 2.410. May be taken concurrently with Real Estate Principles 2.410.

<b>Real Estate Law</b>	<b>2.402</b>	<b>3</b>	<b>0</b>	<b>3</b>
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A practical study of Oregon Real Estate Law emphasizing the more complex aspects of ownership, use and transferability of real estate as encountered by brokers and others who deal with real property. Covers contracts, titles, deeds, leases, liens, covenants, conditions, restrictions, easements, estates, probate, and landlord-tenant relationships. Includes a review of significant Oregon cases.

Prerequisite: Real Estate Principles 2.400 and 2.410. May be taken concurrently with Real Estate Principles. 2.410.

<b>Real Estate Practices</b>	<b>2.404</b>	<b>2</b>	<b>3</b>	<b>3</b>
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Covers the phases of day-to-day operations in real estate sales and brokerage such as procedures of listing, prospecting, advertising, and financing. The closing process, escrow, and sales methods and techniques are treated, with emphasis on the ethics, legal responsibility and function of the broker and salesman.

Prerequisite: Real Estate Principles 2.400 and 2.410. May be taken concurrently.

		Lec.	Lab.	Term Units
<b>Real Estate Principles</b>	<b>2.400</b>	<b>3</b>	<b>0</b>	<b>3</b>

A fundamental course to prepare for entry into the real estate industry. Includes economic, social, and legal bases of real estate transactions, factors of property rights, taxation, real estate instruments, finance, and property ownership.

<b>Real Estate Principles</b>	<b>2.410</b>	<b>3</b>	<b>0</b>	<b>3</b>
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A continuation of Real Estate Principles 2.400 to further prepare for entry into the real estate industry. Includes a basic approach to brokerage and licensing as applied to the State of Oregon covering operating an office, selling, and advertising. Introduces student to accept standards of ethical conduct, property management, titles, valuation, planning zoning, urban renewal, public housing and developments.

Prerequisite: Real Estate Principles 2.400.

<b>Real Estate Salesmanship</b>	<b>2.415</b>	<b>1</b>	<b>4</b>	<b>3</b>
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A course which covers the characteristics and qualifications of successful real estate salesmen. Includes prospecting for sales, sales aids and tools, sales letters, records and reports, handling objections, and public relations for salesmen.

<b>Real Estate Sales Promotion</b>	<b>2.420</b>	<b>2</b>	<b>3</b>	<b>3</b>
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In this course, consideration is given to all factors involved in promoting increased sale, including the analysis of advertising points, writing of realty ads, and general promotion of sales, brochures, mail advertising.

<b>Real Estate Trends and Developments</b>	<b>2.412</b>	<b>3</b>	<b>0</b>	<b>3</b>
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A study of the economic aspects of real estate land use and patterns of growth in Oregon. Provides a grasp of the dynamic factors that create values and an analysis of residential and urban planning, zoning and governmental control factors that influence development and market. Especially valuable as a background course and preparation for more specialized courses.

Prerequisite: Real Estate Principles 2.400 and 2.410.

<b>Real Estate Work Experience</b>	<b>2.431</b>	<b>2</b>	<b>8</b>	<b>4</b>
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Cooperative part-time training in the field of real estate, utilizing the facilities of the business community. The real estate department cooperates with the employer in supervising the student. Students meet twice weekly in a class to discuss on-the-job progress and problems.

Prerequisite: Concurrent enrollment in two other real estate courses and department approval.

<b>Rescue and Emergency Care</b>	<b>5.120</b>	<b>3</b>	<b>2</b>	<b>4</b>
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A combination of First Aid and Rescue Practices. Standard Procedures in the Aid and Care of victims of the most common emergencies. First Aid emphasis will be on the handling of respiratory, burn, cardiac, fracture and shock victims. Practical methods of carrying out rescues in a number of types of emergencies will be covered.

<b>Roentgenology</b>	<b>5.406</b>	<b>1</b>	<b>2</b>	<b>2</b>
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A course teaching the history and discovery of X-Ray. Acquainting the student with the X-Ray equipment. Stressing safety and protective measures.

<b>Roentgenology</b>	<b>5.408</b>	<b>0</b>	<b>4</b>	<b>2</b>
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This course consists of practice in placement of film, cone angulation, machine manipulation, and film processing to develop proficiency in taking X-Rays.

		Lec.	Lab.	Term Units
<b>Route Surveying</b>	<b>6.507</b>	<b>1</b>	<b>6</b>	<b>3</b>
This course is designed to acquaint the student with modes of transportation and the individual problems involved. The material is presented in such a manner so the student will become familiar with the methods and requirements of the various types of transportation.				
<b>Scales and Graphs</b>	<b>4.139</b>	<b>0</b>	<b>6</b>	<b>2</b>
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 department head.				
<b>Scaling Practices</b>	<b>3.617</b>	<b>2</b>	<b>6</b>	<b>4</b>
This course is designed to acquaint the student with the theory and principles of scaling. Considerable time will be spent actually scaling logs for net scale. Types of defect and deductions for each are discussed in conjunction with mill observations.				
<b>Secretarial Accounting</b>	<b>2.651</b>	<b>3</b>	<b>0</b>	<b>3</b>
The fundamentals of bookkeeping such as recording of transactions in journals, posting to ledgers, preparation of the trial balance, and the use of controlling accounts and related schedules with practice in opening, adjusting, and closing various professional sets of books.				
<b>Semi-Conductors</b>	<b>6.237</b>	<b>2</b>	<b>3</b>	<b>3</b>
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 knowledge basic to transistor and semi-conductor theory and practice.				
Prerequisite: Approval of department head.				
<b>Service Records and Customer Relations</b>	<b>4.186</b>	<b>2</b>	<b>0</b>	<b>2</b>
This course is designed to acquaint the student with the various types of service records and billing systems involved in business operations which serve the public. It will stress the rights and obligations of the patron as well as the responsibilities and duties of the business man and/or employee toward the constituent.				
<b>Sheet Metal Drafting</b>	<b>4.230</b>	<b>0</b>	<b>8</b>	<b>3</b>
A course in sheet metal drafting procedures, developments, and layouts, using a variety of development methods.				
<b>Shop Projects</b>	<b>4.250</b>	<b>0</b>	<b>2</b>	<b>1</b>
A course designed to provide practical experience in maintenance and repair of weld shop machines, accessories, fixtures. Selected fabrication and repair projects are also used to develop resourcefulness and confidence in the application of skills and knowledge developed in concurrent courses.				
Prerequisites: Concurrent registration as full time student in the welding program or approval of department head.				

		Lec.	Lab.	Term Units
<b>Shop Projects</b>	<b>4.251</b>	<b>0</b>	<b>2</b>	<b>1</b>
A continuation of Shop Projects 4.250. Prerequisite: Second term standing in the welding program or approval of department head.				
<b>Shop Projects</b>	<b>4.252</b>	<b>0</b>	<b>2</b>	<b>1</b>
The final course in the shop projects sequence. Prerequisite: Third term standing in the welding program or approval of department head.				
<b>Shop Safety</b>	<b>4.253</b>	<b>0</b>	<b>1</b>	<b>1</b>
A survey of principles of safety for industry. Includes the use of films and case studies to develop an awareness of hazards and positive attitudes toward prevention of accidents.				
<b>Shorthand and Transcription</b>	<b>2.620</b>	<b>3</b>	<b>4</b>	<b>4</b>
This is a beginning in Gregg Diamond Jubilee Shorthand. It is a study of simplified principles which should enable the student to take simple dictation and transcribe it in the early part of the course.				
<b>Shorthand and Transcription</b>	<b>2.621</b>	<b>3</b>	<b>4</b>	<b>4</b>
This course includes advanced vocabulary, phrase building, and word building principles. All of these are based on the basic shorthand principles learned in Shorthand 2.620 and 2.622.				
<b>Shorthand and Transcription</b>	<b>2.622</b>	<b>3</b>	<b>4</b>	<b>4</b>
This course is a continuation of Shorthand Theory and Transcription 2.620. It deals with special forms, abbreviated forms, punctuation, and compound words, in connection with writing and transcribing exercises.				
<b>Sketching</b>	<b>4.118</b>	<b>0</b>	<b>3</b>	<b>1</b>
This is a course designed to develop technical sketching techniques and skills as used in drafting room and industrial applications. Laboratory time is devoted to identification of freehand sketching techniques and application.				
<b>Small Engine Electrical Systems</b>	<b>4.182</b>	<b>2</b>	<b>4</b>	<b>3</b>
This course will constitute an intensified study of the electrical systems of small engines including the several types of self-contained magneto, impulse and external type magneto, as well as the popular types of battery ignition and their related systems. Generators, alternators, regulators, rectifiers, starters, and starting systems as well as the various types of solenoids, resistors, relays and the necessary equipment to analyze and diagnose problems within these units will be studied.				
<b>Small Engine Reconditioning</b>	<b>4.183</b>	<b>2</b>	<b>4</b>	<b>3</b>
Small engine reconditioning will provide opportunity for a study of both 2 and 4 stroke cycle engines as are applicable to small power units such as stationary power plants, outboards, chain saws, motorcycles, lawn mowers, etc., and their related systems. Practical experience will be provided in the lab in the use of special tools and power equipment pertaining to these engines.				
<b>Small Gas Engine Theories And Lab.</b>	<b>4.180</b>	<b>3</b>	<b>6</b>	<b>5</b>
Small gas engine theories and laboratory will include such items as theory and background of the development of our modern gas power plants; a study of the principles and physics as they apply to the power ratings and designs which affect these properties, as well as the necessary mathematics involved in the development of these systems.				

		Lec.	Lab.	Term Units
<b>Small Pump Installation</b>	<b>4.295</b>	<b>3</b>	<b>4</b>	<b>4</b>
A course to develop an understanding and practice in the skills necessary for pump installation and operation under a variety of conditions. Various pumps and pump installations are studied with an emphasis being placed on efficient economical operation. Water flow measurement is studied to determine adequate well flow.				
<b>Soil Mechanics</b>	<b>6.124</b>	<b>2</b>	<b>3</b>	<b>3</b>
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 department head.				
<b>Special Drilling Problems</b>	<b>4.297</b>	<b>3</b>	<b>0</b>	<b>3</b>
A course designed to acquaint the student with a variety of special drilling problems which might be caused by geological formations, tool or machine failure. A study is made of a variety of methods used for tool recovery.				
<b>State Drilling Standards and Record Keeping</b>	<b>4.293</b>	<b>3</b>	<b>0</b>	<b>3</b>
A course designed to develop an understanding of the state standards as set down for the water well drilling industry in terms of health and sanitation, fair practices, ethics and standard drilling procedures. Required record keeping and record study is also included.				
<b>Strength of Materials</b>	<b>6.105</b>	<b>2</b>	<b>3</b>	<b>3</b>
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.				
Prerequisites: Applied Mechanics 6.109 and Tech Math 6.266 or equivalent.				
<b>Strength of Materials</b>	<b>6.128</b>	<b>2</b>	<b>3</b>	<b>3</b>
A study of index of properties of soil, hydraulic and mechanical 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.				
Prerequisites: Strength of Materials 6.105 or equivalent.				
<b>Structural Analysis and Design</b>	<b>6.130</b>	<b>1</b>	<b>3</b>	<b>2</b>
The course deals with the determination of stresses induced by loads on structures of wood, steel, concrete, selections of appropriate constructural members and suitable connections; loading conditions causing compression, tension, shear torsion, and bending; practical design procedures, relating to various structural members, beams, girders, columns and footings.				
Prerequisites: Applied Mechanics 6.109; Strength of Materials 6.105.				
<b>Structural Drafting</b>	<b>4.111</b>	<b>0</b>	<b>4</b>	<b>2</b>
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 department head.				

		Lec.	Lab.	Term Units
<b>Subdividing and Community Planning</b>	<b>2.438</b>	<b>2</b>	<b>0</b>	<b>2</b>
Includes a study of the methods by which land is divided for more intensive utilization and the placing of restrictions of this land use. Covers provisions for water and sewage.				
Prerequisite: Real Estate Principles 2.400 and 2.410, and approval of department head.				
<b>Surveying Computations</b>	<b>6.500</b>	<b>1</b>	<b>6</b>	<b>3</b>
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 department head.				
<b>Technical Illustration</b>	<b>4.127</b>	<b>0</b>	<b>4</b>	<b>2</b>
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 free-hand 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 department head.				
<b>Technical Illustration</b>	<b>4.228</b>	<b>0</b>	<b>8</b>	<b>3</b>
This course will cover the various methods of pictorial drawing. Exploded view drawings will be stressed and pencil and ink shading will be used. Both free-hand and template drawing will be covered.				
Prerequisite: Second year standing.				
<b>Technical Illustration</b>	<b>4.229</b>	<b>0</b>	<b>8</b>	<b>3</b>
This course is a continuation of Technical Illustration. The illustration of more complex equipment along with color rendering will be covered in this course. The use of colored pencil, pastel and air brush will be applied to a variety of illustrations.				
Prerequisite: Technical Illustration 4.228.				
<b>Television Principles</b>	<b>4.266</b>	<b>3</b>	<b>0</b>	<b>3</b>
<i>An introduction to the principles of television theory and circuits.</i> A study of underlying principles of television transmission, the make-up of the television signal, and the receiver circuits. Each receiver circuit is individually analyzed as to the principle of operation and possible trouble causes.				
<b>Television Principles Lab.</b>	<b>4.267</b>	<b>0</b>	<b>8</b>	<b>3</b>
A laboratory course applying the principles of the Television Principles theory class. Receiver circuits are traced and analyzed. Trouble shooting procedures are practiced, time is spent on reading and interpreting schematics. Closed circuit TV will be used to demonstrate signal origination.				
<b>Television Servicing</b>	<b>4.268</b>	<b>3</b>	<b>0</b>	<b>3</b>
A study of the overall television receiver and the problems of the television receiver circuits. Service techniques, service procedure and case histories are studied. The theory of color TV and its allied circuits and the adjustments of the color receiver are studied.				

		Lec.	Lab.	Term Units
<b>Television Servicing Lab.</b>	<b>4.269</b>	<b>0</b>	<b>8</b>	<b>3</b>

Circuits of the television receivers are analyzed, both within the receivers and with the use of bread boards. Some of the bread board models will be substituted within the receiver for the like section of the receiver. Voltage readings, oscilloscope patterns, resistance readings and other testing procedures are used and results analyzed. Troubles are installed in TV receivers and practice gained in analyzing determining, and correcting troubles. Black and white sets are given complete audio and video alignment including tuners. Color TV receivers are worked on and the color controls set up.

<b>The Business of Being a Homemaker</b>	<b>7.100</b>	<b>2</b>	<b>2</b>	<b>3</b>
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This course is designed to assist the student in gaining more skill while carrying the responsibility of two full-time jobs. . . that of working outside of the home and the homemaker. The satisfaction of working smarter not harder will be considered in the areas of food planning and preparation; better buying habits; wise use of time, money and energy; selection and care of clothing and equipment in the home.

<b>Timber and Steel Construction</b>	<b>6.125</b>	<b>3</b>	<b>3</b>	<b>4</b>
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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.

<b>Tools and Equipment</b>	<b>3.605</b>	<b>1</b>	<b>2</b>	<b>2</b>
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This course covers principles relating to the proper use of hand tools and power tools; sharpening edged tools; first aid and safety in the woods. Hand tools studied will include hammers, saws, files, planes, brace and bit, square, wrenches axes, pulaskis, hazel hoes, shovels, and pack pumps. Power tools include drills, chain saws, portable fire pumps and brush cutting "disc-type" saws.

<b>Tools and Equipment</b>	<b>3.606</b>	<b>1</b>	<b>2</b>	<b>2</b>
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This course is a continuation of Tools and Equipment 3.605. The principles of felling, bucking and limbing with the power saw are covered and put into actual field practice. The types of recreation structures, materials used in their construction and their location are studied. Various structures are constructed including picnic tables, fireplace forms and foot bridges.

<b>Tool and Fixture Design and Application</b>	<b>4.847</b>	<b>2</b>	<b>4</b>	<b>3</b>
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An overview of design and machining of tool fixtures and jigs. Application of drill jigs, special work holding devices, indexing work holders, templates for form turning and other applications. Class time is devoted to design theory with laboratory time spent on design of special fixtures for production runs.

Prerequisites: Advanced Lathe Practices 4.833, Advanced Milling Machine Practices 4.837, Metal Fabrication and Finishing 4.174.

<b>Topographic Map Interpretation</b>	<b>4.130</b>	<b>2</b>	<b>2</b>	<b>3</b>
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A study to acquaint the student with Topographical Map Interpretation in relationship to water location including the principles governing interpretation of water table maps, developing water table profiles and the effect of surface topography.

		Lec.	Lab.	Term Units
<b>Traffic Engineering</b>	<b>6.553</b>	<b>3</b>	<b>0</b>	<b>3</b>

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 department head.

<b>Transistors and Circuits Theory</b>	<b>4.259</b>	<b>3</b>	<b>6</b>	<b>5</b>
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This course is to consist of: Electron theory, operation of the transistor, transistor characteristics, amplifiers, oscillators, radio and television circuits, new developments of transistors and servicing of transistor circuits. The laboratory section of this course is used to apply the theories and materials covered in the theory section of the course.

<b>Tree Identification</b>	<b>3.610</b>	<b>1</b>	<b>2</b>	<b>2</b>
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This course presents a review of basic botany necessary for tree identification including taxonomy, flower and plant parts with emphasis on fruit, bark and twig characteristics. This first course deals with the common commercial coniferous species of the Pacific Northwest with emphasis on those species native to Oregon.

<b>Tree Identification</b>	<b>3.611</b>	<b>1</b>	<b>2</b>	<b>2</b>
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This is a continuation of Trees Identification 3.610 with the emphasis on the native hardwoods of Oregon. The common forest shrubs are included in this course.

<b>Tuneup and Trouble Shooting</b>	<b>4.185</b>	<b>2</b>	<b>4</b>	<b>4</b>
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This course will deal primarily with electrical, fuel, exhaust, and cooling systems; their various operations and problems. These systems and their inter-related properties, as well as their relationship to other systems inherent in the power plant, and the diagnosis of malfunctions will be covered. Also covered will be a study of the necessary equipment for diagnosing and correcting problems arising in these areas. Fundamental skills and techniques for repairing or reconditioning these units will be presented in the lab.

<b>Tungsten Inert Gas Welding</b>	<b>4.247</b>	<b>1</b>	<b>3</b>	<b>2</b>
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A course designed to develop a familiarity and basic skills in "heliarc" welding, covering the equipment, materials and principles involved in their use. It includes demonstrations and supervised practice on mild steel, aluminum and stainless steel using standard industrial equipment and materials.

Prerequisites: Basic Oxy-acetylene Welding 4.242 or Welding 4.150 or approval of department head.

<b>Typing</b>	<b>2.606</b>	<b>1</b>	<b>4</b>	<b>3</b>
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This is a beginning course in typing for those with no previous typing instruction or a minimum of typing instruction. It covers the parts and construction of the more common makes of typewriters, learning of the keyboard, the basic techniques of the touch system. The student should develop rhythm in his movements and attain a typing speed of at least 20 words per minute.

<b>Typing</b>	<b>2.607</b>	<b>1</b>	<b>4</b>	<b>3</b>
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This is a continuation of typing with emphasis on increasing the typing speed to at least 30 words per minute while mastering various forms of business communications.

		Lec.	Lab.	Term Units
<b>Typing</b>	<b>2.608</b>	<b>1</b>	<b>4</b>	<b>3</b>
A course including corrective and acceleration drills to develop a minimum typing speed of 40 words per minute. The student will receive, in addition, training in the various business papers encountered in a business office.				
<b>Typing</b>	<b>2.633</b>	<b>1</b>	<b>4</b>	<b>3</b>
This is a beginning course in typing for those with no previous typing instruction. It covers the parts and construction of the more common makes of typewriters, learning of the keyboard, the basic techniques of the touch system. The student should develop rhythm in his movements and attain a typing speed of 20 to 30 words per minute. Provision will be made for those students having previous typing training to build up their speed and accuracy as well as review composition arrangements.				
<b>Typing</b>	<b>2.634</b>	<b>1</b>	<b>4</b>	<b>3</b>
This is a continuation of Typing 2.633 with emphasis on increasing speed and accuracy. The student will also receive training in the various business papers encountered in a business office.				
<b>Use of Instruments</b>	<b>4.260</b>	<b>2</b>	<b>0</b>	<b>2</b>
The study of various instruments used in the servicing of radio, hi-fi, television and other equipment. The principles and the usage of the instruments are studied as they apply to the field of servicing. Both regular and short cut methods of usage will be discussed and demonstrated. The materials of the course will closely follow the needs of the servicing courses and applications may be made in the service labs.				
<b>Use of Instruments</b>	<b>4.261</b>	<b>2</b>	<b>0</b>	<b>2</b>
A continuation of the Use of Instruments with more advanced instruments and methods.				
<b>Vacuum Tubes and Circuits Theory</b>	<b>4.257</b>	<b>6</b>	<b>0</b>	<b>6</b>
The theory of vacuum tubes and their applications to circuits. A study of the principles of operation of the various types of vacuum tubes, their symbols, and usage. The use of tube characteristics in practical work and the construction and use of load line. The study of basic amplifiers, power supplies, and oscillator circuits. The math necessary for this course will be taught as part of the course.				
<b>Vacuum Tubes and Circuits Lab.</b>	<b>4.258</b>	<b>0</b>	<b>6</b>	<b>2</b>
This course consists of: The principles of construction of the vacuum tube, identification of tube elements, working with the theories taught in the theory classes, also basic trouble shooting procedures. The bread board building of the amplifiers, power supplies and oscillator circuits studied in the theory classes.				
<b>Vacuum Tube and Transistor Analysis</b>	<b>6.223</b>	<b>3</b>	<b>3</b>	<b>4</b>
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 semi-conductor diodes; three element vacuum tubes and transistors; multi-grid tubes including				

	Lec.	Lab.	Term Units
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: Electrical Theory DC 6.200, Technical Mathematics 6.261, or approval of department head.			

<b>Water Distribution Systems</b>	<b>5.107</b>	<b>3</b>	<b>0</b>	<b>3</b>
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Main systems: hydrants—size, gridding, distribution; residential and commercial districts; fire flow requirements; pumping stations; high pressure systems; storage tanks and cisterns; mobile supplies.

<b>Wave Generation and Shaping</b>	<b>6.234</b>	<b>2</b>	<b>5</b>	<b>3</b>
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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 department head.

<b>Weld Shop Problems</b>	<b>4.249</b>	<b>3</b>	<b>9</b>	<b>5</b>
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This course is designed to be a review and application of the welding, layout and fabrication processes covered during the year. A study and practice of production welding methods, electrode consumption and method selection is included. Fabrication and assembly projects are selected to present typical layout, fabrication and production problems.

Prerequisites: Satisfactory completion of the first and second terms with concurrent registration in Tungsten Inert Gas Welding 4.247 and Metallic Inert Gas Welding 4.248 or approval of department head.

<b>Welding</b>	<b>4.150</b>	<b>1</b>	<b>3</b>	<b>2</b>
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An introductory survey course in welding technology correlating technical information with actual practice to provide the student with an understanding of the composition of various metals and methods of fabrication used in construction, maintenance and repair. Includes set-up and operation of oxy-acetylene and arc welding equipment; demonstrations and practice in welding, brazing and soldering ferrous and non-ferrous metals and their alloys.

<b>Welding for Certification</b>	<b>4.166</b>	<b>2</b>	<b>6</b>	<b>4</b>
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This course is designed to turn out certified welders. Extensive practice on simulated tests required for certification in plate and pipe welding is followed by the test and certification by the state if the student qualifies. A study of welding procedures, previously covered, as they apply to heavy gauge welding is included.

Prerequisites: Third term standing and successful completion of basic and intermediate welding courses. Certification test fee is determined by the number of students involved and the type of test. The fee must be paid at least one week prior to the test date.

		Lec.	Lab.	Term Units
<b>Welding for Production and Economy</b>	<b>4.165</b>	<b>2</b>	<b>2</b>	<b>3</b>
A study and practice of production welding methods, electrode consumption, method selection. Adaption of jigs and fixtures to the weld process.				
Prerequisites: Sixth Term standing and completion of basic and advanced welding courses.				
<b>Wood Industry Economics</b>	<b>4.286</b>	<b>3</b>	<b>0</b>	<b>3</b>
A course designed to acquaint the student with the position of the wood industry in the economics structure; factors involved and production costs, marketing and sales.				
<b>Wood Preservation and Finishing</b>	<b>6.282</b>	<b>2</b>	<b>3</b>	<b>3</b>
This course is designed to acquaint the student with the problems and control of wood-destroying agencies; the kind of preservatives and their application; the methods of prefinishing forest products.				
<b>Wood Products Marketing</b>	<b>3.614</b>	<b>2</b>	<b>3</b>	<b>3</b>
This course is designed to acquaint the student with all aspects of Wood Products marketing from the producer to the consumer taking in to consideration the relationships of quality control, traffic, wholesaling, retailing, financing, ordering, and merchandising.				
Prerequisite: Quality Control of Wood Products 6.287.				
<b>Wood Structure and Identification</b>	<b>6.280</b>	<b>1</b>	<b>6</b>	<b>3</b>
This course covers the basic wood structure and the gross features of wood and is designed to provide the student with the ability to identify the common species of the softwoods and hardwoods in the form of solid wood and wood fiber.				

## Part Time Extension Courses

### OCCUPATIONAL EXTENSION

- Advanced Arc Welding** **9.151** **30 Hrs.**  
A course designed to further develop the welding skills of the worker. Lab, vertical and corner welding techniques are stressed. Brazing and bronze welding with oxy-acetylene equipment is introduced. Overhead welding with electric arc is demonstrated and practiced.  
Prerequisite: Ability to benefit from instruction, basic welding experience, and consent of instructor.
- Basic A.C. Theory** **9.681** **36 Hrs.**  
The course consists of the study of basic A.C. theory. The material is viewed both from the theoretical and practical usage necessary for understanding. Laboratory work is provided as needed to develop greater understanding of principles involved.  
Prerequisite: Ability to benefit from instruction and an interest in the field of electronics for bettering one's position.
- Basic Arc Welding** **9.150** **30 Hrs.**  
Demonstration and practice of the basic techniques used in welding ferrous metals and alloys. Set-up and operation of oxy-acetylene and electric arc welding equipment is demonstrated and practiced.  
Prerequisite: Ability to benefit from instruction.

- Basic D.C. Theory** **9.680** **36 Hrs.**  
 The course consists of the study of basic D.C. theory. The material is viewed both from the theoretical and practical usage necessary for understanding. Laboratory work is provided as needed to develop greater understanding of principles involved.  
 Prerequisite: Ability to benefit from instruction and an interest in the field of electronics for bettering one's position.
- Blueprint Reading for the Building Trades** **9.136** **30 Hrs.**  
 A beginning course designed to teach the fundamentals of blueprint reading including the interpretation and meaning of lines, views, elevations, conventions and symbols, and relationship of the various elements comprising architectural drawings and specifications.  
 Prerequisite: Employment in one of the building trades and a desire to upgrade occupational competency through extensive study.
- Blueprint Reading for Welders** **9.139** **30 Hrs.**  
 A course designed to teach the fundamentals of blueprint reading including basic sketching techniques and reading of three view drawings. Included will be: dimensioning practices, scaling, line alphabet, notes and symbols. Emphasis will be placed on developing an ability to read detail and weldment drawings.  
 Prerequisite: An ability to profit from instruction.
- Building Construction Drafting** **9.100** **30 Hrs.**  
 A beginning course designed to introduce the student to the fundamentals and techniques included in architectural planning procedures. From a study of the basic elements of house planning, the student progresses through the various design steps to a completed plan.
- Building Construction Estimating** **9.137** **30 Hrs.**  
 A practical course devoted to utilization of different sets of specifications and plans in the application of the functions of an estimator.  
 Prerequisite: A working knowledge of the general phases of building work, the ability to read and interpret plans and specifications and a working knowledge of basic mathematics.
- Critical Path Scheduling** **9.605** **30 Hrs.**  
 An introduction into the fundamentals of critical path scheduling as used in the construction and management field. Event time, activity time, network planning and construction, scheduling, cost control, precedence diagramming pert, less, and mos are items and systems studied and discussed—the course concludes with a brief electronic computer application of critical path methods.
- Electronic Diagram Interpretation** **9.620** **30 Hrs.**  
 An introduction course to Electronics and the terminology of the field. A study is made of the components and their symbols; basic diagrams are introduced and circuit tracing practiced. Actual working circuits are traced and drawn out to familiarize the student for on-the-job situations.
- Heliarc Welding** **9.154** **30 Hrs.**  
 A course in the fundamentals of tungsten inert gas welding processes, machine setting, application, and development of inert gas welding skills.  
 Prerequisite: Satisfactory completion of basic and advanced welding or equivalent experience and knowledge.

**Industrial Control Devices Theory  
and Application**

**9.190**

**36 Hrs.**

The course consists of a study of the various instruments used in industry to control manufacturing processes. Care and maintenance, trouble shooting, standards and calibration of instruments is investigated. The theory and principles of application of the basic instruments will be discussed.

Prerequisite: Work experience in the installation and/or maintenance of industrial equipment.

**Machine Tool Operations**

**9.230**

**30 Hrs.**

A basic machine shop course for technicians. Class time is devoted to theories of: measuring tools and measurement; cutting speeds and feeds of various materials; bench tools and use; function and design of machine tools; decimal equivalents, etc. Laboratory time is provided to acquaint the student with basic operations such as: straight turning; shoulder turning; facing and shoulder facing; boring; reaming, shaping; flat surfaces; drill press work and milling machine fundamentals.

**Machine Tool Operations**

**9.231**

**30 Hrs.**

A continuation of the Machine Operation series. Class hours are spent on subjects such as: cutting tools and use; thread forms; tapers, grinding wheel structure; simple indexing, etc. Laboratory time will be devoted to operations on lathe, shaper, milling machine, drill press and grinder. The operations included will be threading; taper turning, serrating and slotting; slag and face milling, spot facing, counter-boring and offhand grinding.

**Machine Tool Operations**

**9.232**

**30 Hrs.**

The course will cover such subjects as compound indexing, machine grinding (surface and cylindrical) gears and gearing; multi lead screws; fits; splines and splining, etc. Shop practices include advanced machine tool operations such as: surface grinding, cylindrical grinding; jig boring; angular and contour milling; advanced shaper work and other areas.

**Mechanical Blueprint Reading and  
Sketching**

**9.138**

**30 Hrs.**

A course designed to develop the ability of the student in the field of blueprints. Special attention is given to the development of visualization and to the conventions used in blueprints.

**Mechanical Principles**

**9.191**

**30 Hrs.**

A course designed to acquaint the student with the mechanical principles in use in industrial equipment. The material is presented in such a manner that will connect general mechanical principles to the machines to which they apply, with examples of specific applications wherever appropriate.

Prerequisite: Ability to benefit from instruction, and consent of instructor.

**Practical Engineering Applications**

**9.606**

**48 Hrs.**

A review course for those persons preparing for the Professional Engineer examination. The course consists of 12 weeks study of the science of hydraulics with special emphasis placed upon hydrology. An additional 12 weeks is spent in a study of the science of structural analysis.

**Preparation for Welding Certification** 9.152 36 Hrs.

A review and further development of those welding skills required for welder certification. Emphasis is placed upon simulated tests required for certification.

Prerequisite: Satisfactory completion of Basic and Advanced Welding or equivalent experience and knowledge.

**Review in Engineering Fundamentals** 9.602 48 Hrs.

A review course for those persons preparing for the Engineer-In-Training examination. The course consists of a broad study of the appropriate sciences necessary to the engineering field.

Prerequisite: Minimum qualifications in accordance with O.R.S. 672.083 which are briefly as follows:

- (1) Graduation in an approved engineering curriculum of four years or more from a school or college approved by the Board . . . or (2) a specific record of four years or more of active practice in engineering work of a character satisfactory to the Board.

**Sheet Metal Patterns and Layout** 9.145 30 Hrs.

An introductory course covering the basic concepts and skills needed to develop simple sheet metal forms; drafting table techniques and benchwork techniques to be equally employed.

Prerequisite: Ability to benefit from the training.

**Transistor Theory and Application** 9.684 36 Hrs.

A course of study in the basic principles of solid state device theory. Including electron physics, two element devices, NP & PN Junctions, the make-up of a transistor, the three basic transistor configurations, small signal amplifiers, transistor parameters and the transistor in resistive networks.

**Transistor Theory and Application** 9.685 36 Hrs.

A continuation of the study of the transistor and its applications. Applying it to large signal amplifiers, RF circuits, oscillators, wideband amplifiers, transistor substitution, and uses in practical circuits, also new types and specialized types of solid state devices are studied.

**Use of Electronic Test Instruments** 9.608 30 Hrs.

A course of study in the use of various types of test equipment. Assorted types and brands of test equipment is brought into the classroom and the uses and operation of the equipment are studied. New equipment is loaned by the manufacturers for demonstration and comparison in this course.

**Vacuum Tube Theory and Application** 9.612 36 Hrs.

This is an introductory course into the study of vacuum tubes and basic allied circuits. The vacuum tube is looked at according to its construction and the purpose for each element within the tube. The various load lines are taken up and constructed and their uses applied to practical applications. Classes of amplifiers and the coupling of them and their frequency response are discussed with applications to various commercial and industrial circuits. Power supplies and filter networks studied are the basic types used in the field. The laboratory sessions of the course are designed to apply the knowledge gained in class and to clear up concepts discussed in theory sessions.

Prerequisite: A basic knowledge of DC and AC Theory with the desire and ability to benefit from the course, and with the permission of the instructor.

# Home Economic Adult Education Courses

## FAMILY LIFE

**Living With Your Preschooler** 9.933 10 Hrs.

Planned to help parents of preschoolers develop a better understanding of what to expect from a child of this age. Patterns of emotional, physical and social growth will be included.

**Training For Child Care Services** 9.935 180 Hrs.

This is basically a child development course geared toward wage earning. It prepares students for work as assistants in day care centers, nursery schools and in other child care services. There are field trips to acquaint the student with a variety of child care facilities and to give practical experience.

**Realities of Later Year Living** 9.925 12 Hrs.

Men and women of pre-retirement and retirement ages receive assistance in facing realities of later year living involving different aspects of preparation for and enjoyable and effective retirement. A number of resource persons participate.

## HOUSEHOLD ADMINISTRATION

**Better Living Seminar, Money, Time and Energy Savers For The Busy Homemaker** 9.937 6 Hrs.

A quick probe into the uses of time, energy, money and other resources, which will be especially valuable to the mother working outside of the home. The goal is for each person to seek to better her (or his) lot in life and generally improve family living. Field trips.

**Better Living Seminar. Selection and Care of Appliances and Equipment For The Home** 9.938 7½ Hrs.

Consideration of types, sizes, prices, length of life, and care of major appliances and small equipment. Simple repairs are stressed also. This is helpful to men as well as women.

**Landscaping and Plant Materials For For Home Grounds** 9.801 30 Hrs.

An individual project, "Your Home Grounds" is considered by the student, in planning for the present and future. There is a study of the more common shrubs and trees used in Northwest gardens. Special guest lectures supplement regular class work. In addition, there are three field trips.

**Home Buying Techniques** 9.939 20 Hrs.

This course provides general information for the individual concerned with buying or selling his home. Ways to avoid possible financial problems connected with home ownership and family needs will be considered. There will be resource people, such as home builders, realators, title insurance agents and others. Field trips.

**Home Accessories For Profit and Pleasure** 9.932 25 Hrs.

Preparation for creating and constructing accessories for the home helps the homemaker in her own home and as a wage earner. Drapery and curtain planning, antiquing wood objects, constructing pillows and such articles as bed spreads, table appointments, etc., are demonstrated and developed. Field trips.

**Home Furnishings** 9.924 24 Hrs.

The study of styles, arrangements, quality and cost of furniture, plus color schemes, window treatments, and modern fibers and fabrics are included. There will be demonstrations and field trips.

**CLOTHING AND RELATED AREAS**

**Basic Bishop Sewing** 9.907 30 Hrs.

A professional look can be achieved in this course as the students use the efficient sewing techniques which are demonstrated by the instructor. A two-piece coordinated cotton dress, fitted wool skirt and a jumper or related garments may be completed by the homemaker who wishes to gain sewing ease and confidence.

**Bishop Dressmaking** 9.908 30 Hrs.

Additional Bishop Method sewing techniques are taught in constructing "better dresses" with more detailed patterns. Techniques for the construction of a man's shirt are included.

Prerequisite: Basic Bishop.

**Bishop Tailoring** 9.909 30 Hrs.

The most recent Bishop Method time-saving and sewing machine tailoring techniques are shown for use by the student who constructs a suit or coat during the course.

**Dressmaking As A Business** 9.927 30 Hrs.

Offered to those who are interested in employment or are maintaining a dressmaking business. Emphasis on promoting and carrying out good business techniques in custom sewing and in the selection of appropriate styles and fabrics.

**Sewing for Beginners** 9.928 30 Hrs.

Persons with little or no sewing experience find this course to be most enjoyable and helpful. Simple Bishop Sewing Techniques are emphasized, in the construction of a simple shift and other articles.

**Tailoring** 9.904 30 Hrs.

A wide variety of tailoring techniques are demonstrated as students construct wool suits and coats.

**Sewing With Knits and Stretch Fabrics** 9.930 30 Hrs.

Basic techniques related to the construction of garments from knit and stretch fabrics include women's three-piece suit, men's sweaters, women's slacks and bathing suits.

**Advanced Sewing With Knits and Stretch Fabrics** 9.934 30 Hrs.

Adapting commercial patterns to sewing with knit and stretch fabrics is emphasized, as well as pattern and fabric selection and construction details. Dresses, coats, jacket costumes and suits may be constructed.

**Active Sportswear** 9.912 15 Hrs.

Selection, fitting and construction of slacks and capris for women and girls are emphasized.

## FOODS AND NUTRITION

### **Fun With Food and Family** **9.940** **30 Hrs.**

Are you a hesitant hostess? Are your mealtimes pleasant and enjoyable? Do you wish you knew more about serving good food attractively? Our course may help you to plan and buy more wisely, prepare and serve meals for your family and friends, while enjoying it. Opportunities to practice food preparation and entertaining. Demonstrations; field trips.

### **Cooking Creatively** **9.941** **24 Hrs.**

Designed to give insight into a chef's viewpoint of preparation and serving food for the family. It is taught by a former chef and coordinated by a home economist. Preparation and serving of sea foods, European cookery, left-overs and meats are included in the demonstrations and discussions. **This course is for beginners as well as for those with experience.**

## Firemen Training Courses

### **Communications** **9.115** **20 Hrs.**

Effective radio procedures, tone activated and telephone alerting systems, running cards, alarm systems, and communication command centers.

### **Fire Apparatus Maintenance** **9.110** **20 Hrs.**

Inspection, service, maintenance and regular checking procedures necessary to maintain fire apparatus in a "ready" condition.

### **Fire Department Administration** **9.106** **30 Hrs.**

A course designed for chief administrators of fire departments and for command officers. Topics include: organization, personnel management, alarm and signal systems, insurance ratings and relationship with other departments.

Prerequisite: Approval of local Fire Training Coordinator.

### **Fire District Organization** **9.107** **30 Hrs.**

The scope and authority of directors, election laws, legal frame work and court decisions affecting districts, relative merits of contracting and mutual aid organization. *This course is designed primarily for directors of rural fire protection districts and small municipalities.*

Prerequisite: Approval of Fire Training Coordinator.

### **Firefighting "A"** **9.101** **30 Hrs.**

A beginning course to acquaint the student with fire behavior; the organization of his department, how he should conduct himself in the department; responding to alarms; and training to develop skills in the use of small tools, ropes, knots, hose lines and ladders.

### **Firefighting "B"** **9.102** **30 Hrs.**

A continuation of Firefighting 9.101, designed to train the student in the use of portable fire extinguishers, in methods of overhaul and salvage, in the principles of fire control in natural cover crops, in forcible entry tactics and in ventilation and rescue procedures.

Prerequisite: Firefighting 9.101.

- Firefighting "C"** **9.103** **30 Hrs.**  
 A continuation of Firefighting 9.102. The study of fire streams, fire apparatus, pre-fire planning, flammable liquids and gasses, structure fire problems and practice evolutions. Emphasis is placed on demonstration, practice and drill.  
 Prerequisite: Firefighting 9.102.
- Firefighting "D"** **9.104** **30 Hrs.**  
 A continuation of Firefighting 9.103, intended to review for the student fire control tactics, then apply these principles to specific types of buildings and hazards. Included are: air crash and rescue, mills, factories and large structure fires, and motor vehicle fires.
- Fire Investigation** **9.112** **30 Hrs.**  
 A study of the burning characteristics of combustibles, burn patterns leading to the point of origin, incendiary indications and the preservation of evidence. A course for Fire Marshals, Inspectors and Chief Officers.
- Fire Pump Construction and Operation** **9.108** **30 Hrs.**  
 A basic course for instructors and pump operators presenting theory of pumps, water supply, principles of drafting and pumping from hydrant. Actual practice using local department's apparatus included.
- Fire Scene Problems** **9.113** **20 Hrs.**  
 Practical experience in handling actual building fires including the application of size-up, attack, extinguishment, ventilation, rescue, overhaul, salvage and other fire control techniques that may be applicable.
- Flammable Liquids and L.P.G.** **9.114** **20 Hrs.**  
 A comparison of the characteristics—flash point, explosive range, etc.—of the more common petroleum products followed by practice extinguishment or control.
- Hydraulics and Water Measurement** **9.109** **34 Hrs.**  
 A course for instructors, command officers and pump operators presenting fire pump hydraulics and measurement including velocity of flow, friction loss, engine and nozzle pressure, discharge, stream range, drafting water, pumping from hydrant and relaying, service testing and measuring water in mains and supply.  
 Prerequisite: Pump Construction and Operation 9.108.
- Inspection and Codes** **9.111** **20 Hrs.**  
 A survey of building exit, flammable liquid and other fire prevention codes followed by supervised building inspection field trips. Designed primarily for department inspectors.
- Introduction and Orientation** **9.100** **30 Hrs.**  
 The course is designed for newly formed fire departments. It consists of a familiarization of personnel with the available fire-fighting apparatus and tools. The objective is to give untrained persons in the briefest time possible the necessary training to respond to fires. Content varies according to needs and equipment of the department.
- Officer Training** **9.105** **30 Hrs.**  
 A course for company officers outlining responsibilities to the department and to the men, leadership requirements, discipline, station maintenance, etc.

**Peacetime Radiation Hazards** 9.116 20 Hrs.  
A study of the effect of the atomic age on the fire service, the handling of radioactive materials involved in fire, the use of monitoring equipment and personnel safety practices.

**Special Hazards** 9.117 20 Hrs.  
A study of electrical, chemical, exotic metal and space age fuel fires.

## **INDUSTRIAL SUPERVISORY PROGRAM COURSES**

**Basic Psychology for Supervisors** 9.502 3 Units  
Course to assist the supervisor in understanding the people with whom he works, with emphasis on the psychological aspects, perceptions, learning processes, emotions, attitudes and personalities, etc.

**Cost Control for Supervisors** 9.514 3 Units  
How costs are determined in industry. Cost control and its functions. The supervisor's responsibility for costs. Factors in cost control: costs, materials, waste, salvage, quality control, quantity control, control of time.

**Developing the Employees Through Training (Teacher Training)** 9.504 3 Units  
The supervisor's responsibility for developing employees through training. Orientation and induction. Vestibule and on-th-job techniques. Job instruction principles. Apprenticeship training. Technical training. Supervisory training and management development. Use of outside agencies. Advisory committees.

**Elements of Supervision** 9.500 1 Unit  
A basic introductory course covering in general terms the total responsibilities of a supervisor in industry such as organization, duties and responsibilities, human relations, grievances, training, rating, promotion, quality-quantity control, management-employee relations, etc.

**Human Relations (Developing Supervisory Leadership)** 9.506 3 Units  
To show the practical application of basic psychology in building better employer-employee relationships by studying human relations techniques.

Prerequisite: Basic Psychology for Supervisors.

**Industrial Economics** 1.506 3 Units  
Significant economic facts. Development of a critical attitude toward industrial economics. Institutions and practices that determine our social environment. Management-supervisory-employee relationships to economics and local industry.

**Job Analysis for Wage Administration** 9.520 3 Units  
The history of wages. Inequalities in rates of pay. Management and union movement toward a "fair wage" plan. The supervisor and job description, job specifications, job evaluations, and job classifications. The wage plan laid down by the Department of Labor. The Federal Employment Service. Wage administration and the line organization.

**Labor-Management Relations** 9.508 3 Units  
The history and development of the Labor Movement-Development of the National Labor Relations Acts, the Wagner Act, the Taft-Hartley Act. The supervisor's responsibility for good labor relations. The union contract and grievance procedure.

- Management Controls and the Supervisor 9.524 3 Units**  
 Basic principles of controls. Delegation of responsibility through the use of controls. The purpose and objectives of controls, manufacturing costs, quality control, quantity control, production control, control over materials, control over personnel organizations, etc.
- Methods Improvement for Supervisors (Work Simplification) 9.512 3 Units**  
 The supervisor's responsibility for job methods improvement. The basic principles of work simplification. Administration and the problems involved. Motion study fundamentals for supervisors. Time study techniques.
- Oral Communication for Supervisors 9.503 3 Units**  
 How we communicate. Effective speaking and listening. Kinds of supervisory communications. Saying what we mean, which covers oral versus written communications. Understanding what is communicated as related to intent and effect. Conference leading and practice for supervisors.
- Organization and Management 9.518 3 Units**  
 The supervisor's responsibility for planning, organizing, directing, controlling, and coordinating. Acquaints the supervisor with these basic functions of an organization and his responsibility in carrying them out in accordance with the organization's plan. Establishing lines of authority, functions of departments or units, duties and responsibilities, policies and procedures, rules and regulations, etc.
- Reading Improvement for Supervisors 9.507 3 Units**  
 General approach to better reading through the proper use of text material, reading films, tachistoscope, and practice. Benefits of better reading, primary considerations in reading, evaluating and analyzing what is read, vocabulary improvement, advanced reading tips.
- Report Writing for Supervisors 9.505 3 Units**  
 Types of reports: statistical, financial, narrative, technical. Steps in preparing the report. Gathering and sorting information. Designing and organizing the report. Parts of the report. Techniques of writing. Format, style, and organization. Illustrating the report. Practice in writing and evaluating reports in the occupational field of the individual enrollees.  
 Prerequisite: Written Communications for Supervisors or equivalent.
- Safety Training and Fire Prevention 9.522 3 Units**  
 Problems of accidents and fire in industry. Management and supervisory responsibility for fire and accident prevention. Accident reports and the supervisor. Good housekeeping and fire prevention. Machine guarding and personnel protective equipment. State Industrial Accident Code and fire regulations. The First Aid department and the line supervisor's responsibility. Job instruction and safety instruction. Company rules and enforcement. Use of safety committees program. Your insurance carrier and the Insurance Rating Bureau. Advertising and promoting a good safety and fire prevention program.
- Supervisor's Responsibility for Management Of Personnel 9.516 3 Units**  
 Personnel techniques for which the supervisor is partially responsible and for which he should have some training in carrying out his responsibility. Selection, placement, testing, orientation, training, counseling, merit rating, promotion, transfer, and training for responsibility.

**Written Communications for Supervisors 9.501 3 Units**

Review of writing mechanics covering grammar, punctuation, sentence structure, and paragraph structure. Business letter-writing involving the principles, planning, and dictating of letters. Memorandum and bulletin writing with emphasis on format, content, structure, tone, and style. Manual writing covering format, content, and structure.

**REAL ESTATE PROGRAM COURSES**

**Commercial and Investment Properties 9.275 4 Units**

A course designed to provide information for licensed brokers and real estate salesmen. Emphasis is placed on process of selecting commercial property of all types for investment purposes. All factors of influence are analyzed. Determination of actual net income is stressed.

**Elements of Design and Construction 9.274 2 Units**

A comprehensive non-technical course given primarily for real estate licensees to familiarize them with building construction and materials, cost, building codes, terminology used in construction.

**Fundamentals of Exchanging 9.272 3 Units**

The principles involved and practices followed in exchanging of real property for like property. Analyze tax situations involved, and advantages accruing from certain exchanges.

Prerequisite: Real Estate Principles 9.262 and 9.263.

**Fundamentals of Real Estate Taxation 9.271 3 Units**

An advanced and intensive study of tax principles governing the acquisition, ownership, operation, and disposition of real property with special emphasis on tax planning, and disposition of real property with procedural aspects.

Prerequisite: Real Estate Principles 9.262 and 9.263.

**Property Management 9.277 2 Units**

A study of the business practices and principles of managing the property of others for a fee. Includes such factors as maintenance and repairs, personnel supervision.

Prerequisite: Real Estate Principles 9.262 and 9.263.

**Real Estate Appraisal 9.266 3 Units**

Theories, functions and purposes of appraisal. Residential, income property and land appraisal; principles of valuation, including cost, market and income approach; techniques for determining condemnation, insurance, loan, purchase and sales values.

Prerequisite: Real Estate Principles 9.262 and 9.263.

**Real Estate Appraisal 9.280 3 Units**

Continuation of Real Estate Appraisal 9.266 with emphasis on specific problem areas such as commercial appraisals, farm appraisals, industrial appraisals.

Prerequisite: Real Estate Appraisal 9.266.

**Real Estate Counseling 9.284 5 Units**

A case study approach to the problems of counseling with clients on real estate purchases, exchanges, speculation, and investment.

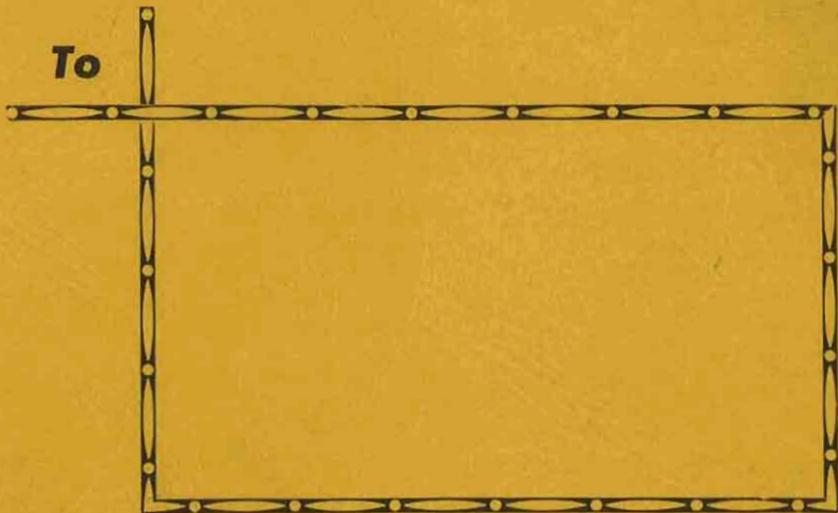
**Real Estate Finance 9.267 3 Units**

Policies, problems and risks involved in financing and investing in various types of real property. Includes analysis of taxation, exchanges, sources of loan funds, institutional and government policies, and instruments and methods of loan processing.

Prerequisite: Real Estate Principles 9.262 and 9.263. May be taken concurrently with Real Estate Principles 9.263.

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| <b>Real Estate Law</b>   | <b>9.265</b> | <b>3 Units</b> |
| <p>A practical study of Oregon Real Estate Law emphasizing the more complex aspects of ownership, use and transferability of real estate as encountered by brokers and others who deal with real property. Covers contracts, titles, deeds, leases, liens, covenants, conditions, restrictions, easements, estates, probate, and landlord-tenant relationships. Includes a review of significant Oregon cases.</p> <p>Prerequisite: Real Estate Principles 9.262 and 9.263. May be taken concurrently with Real Estate Principles 9.263.</p> |              |                |
| <b>Real Estate Practices</b>   | <b>9.264</b> | <b>3 Units</b> |
| <p>Covers the phases of day-to-day operations in real estate sales and brokerage such as procedures of listing, prospecting, advertising, and financing. The closing process, escrow, and sales methods and techniques are treated, with emphasis on the ethics, legal responsibility and function of the broker and salesman.</p> <p>Prerequisite: Real Estate Principles 9.262 and 9.263. May be taken concurrently.</p>   |              |                |
| <b>Real Estate Principles</b>  | <b>9.262</b> | <b>3 Units</b> |
| <p>A fundamental course to prepare for entry into the real estate industry. Includes economic, social, and legal bases of real estate transactions, factors of property rights, taxation, real estate instruments, finance, and property ownership.</p>  |              |                |
| <b>Real Estate Principles</b>  | <b>9.263</b> | <b>3 Units</b> |
| <p>A continuation of Real Estate Principles 9.262 to further prepare for entry into the real estate industry. Includes a basic approach to brokerage and licensing as applied to the State of Oregon covering operating an office, selling, and advertising. Introduces student to accepted standards of ethical conducts, property management, titles, valuation, planning zoning, urban renewal, public housing and developments.</p> <p>Prerequisite: Real Estate Principles 9.262.</p>   |              |                |
| <b>Real Estate Salemanship</b>   | <b>9.270</b> | <b>3 Units</b> |
| <p>A course which covers the characteristics and qualifications of successful real estate salesmen. Includes prospecting for sales, sales aids and tools, sales letters, records and reports, handling objections, and public relations for salesmen.</p>  |              |                |
| <b>Real Estate Sales Promotion</b>   | <b>9.276</b> | <b>3 Units</b> |
| <p>In this course, consideration is given to all factors involved in promoting increased sales, including the analysis of advertising points, writing of realty ads, general promotion of sales, brochures, mail advertising.</p>  |              |                |
| <b>Real Estate Trends and Developments</b>   | <b>9.268</b> | <b>3 Units</b> |
| <p>A study of the economic aspects of real estate land use and patterns of growth in Oregon. Provides a grasp of the dynamic factors that create values and an analysis of residential and urban planning, zoning and governmental control factors that influence development and market. Especially valuable as a background course and preparation for more specialized courses.</p> <p>Prerequisite: Real Estate Principles 9.262 and 9.263.</p>  |              |                |
| <b>Subdividing and Community Planning</b>  | <b>9.278</b> | <b>2 Units</b> |
| <p>Includes a study of the methods by which land is divided for more intensive utilization and the placing of restrictions on this land use. Covers provisions for water and sewage.</p> <p>Prerequisite: Real Estate Principles 9.262 and 9.263, and approval of the instructor.</p>  |              |                |

To



4389 SATTER DRIVE N. E. , SALEM, OREGON 97303

