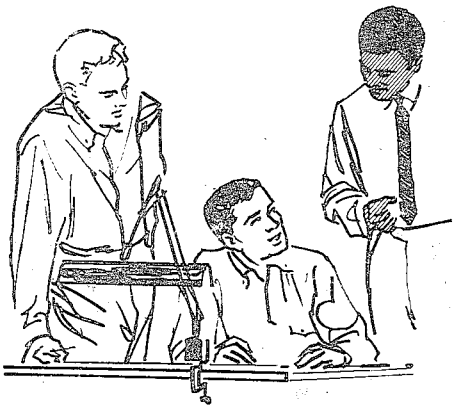

Washtenaw Community College

1967 - 1968

Washtenaw Community College

P. O. BOX NO. 345

ANN ARBOR, MICHIGAN

TELEPHONE: 483-5152

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CATALOG NUMBER TWO

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COLLEGE CALENDAR 1967-1968

SUMMER SESSION 1967

June 26 ..... Registration (Day and Extended-Day Classes)
June 27 ..... Classes Begin
July 3 - 4 ..... No Classes
July 5 ..... Classes Resume
August 17 - 18 ..... Final Examinations
August 21 ..... Grades Due

FALL SEMESTER 1967

September 5 - 6 ..... Faculty Meetings
September 7 - 8 ..... Registration
September 11 ..... Classes Begin
November 10 ..... Mid Semester
November 22 ..... Classes dismissed after 10:20 p.m.
November 23 - 25 ..... Thanksgiving — No Classes
November 27 ..... Classes Resume
December 15 ..... Classes dismissed after 10:20 p.m.
December 16 - January 1 ..... Christmas — No Classes
January 2 ..... Classes Resume
January 22 - 24 ..... Final Examinations
January 25 - 27 ..... Evaluation
January 27 ..... Semester Ends

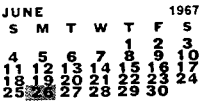
SPRING SEMESTER 1968

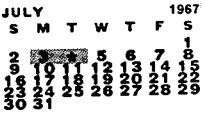
January 29 - 31 ..... Counseling
February 1 - 2 ..... Registration
February 5 ..... Classes Begin
April 5 ..... Mid Semester
April 12 ..... Classes dismissed after 10:20 p.m.
April 13 - 20 ..... Spring Recess — No Classes
April 22 ..... Classes Resume
June 3 - 5 ..... Final Examinations
June 6 - 7 ..... Evaluation

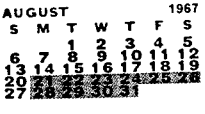
SUMMER SESSION 1968

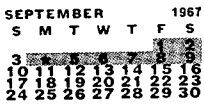
June 24 ..... Registration (Day and Extended)
June 25 ..... Classes Begin
July 4 - 6 ..... No Classes
July 8 ..... Classes Resume
August 15 - 16 ..... Final Examinations
August 19 ..... Grades Due

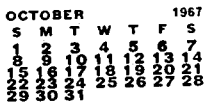
CALENDAR FOR 1967-1968

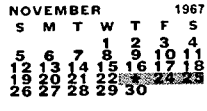


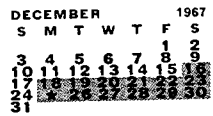


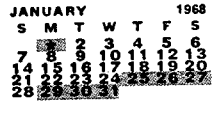


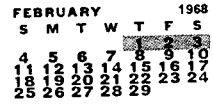


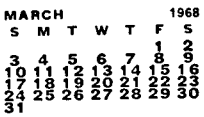


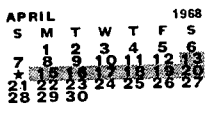


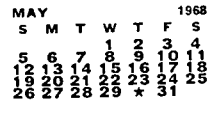


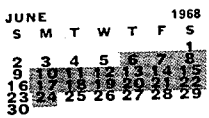


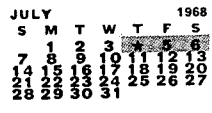


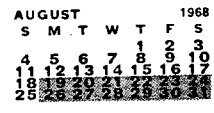












HISTORY OF THE COLLEGE

Washtenaw Community College has had a short, but exciting and meaningful history. On January 15, 1965 the voters of the county gave overwhelming approval to the establishment of a publicly supported county-wide community college. The citizens of the county indicated a real desire to support a comprehensive institution which would offer a variety of technical, industrial, and semi-professional courses as well as fully developed college transfer and general education curricula.

The first year of the college operation witnessed the translation of many ideas of citizens into positive action. In September 1966 the college enrolled over 1200 students in some 30 different occupational programs and equally comprehensive college transfer courses of study. During the first year, more than 100 different courses were offered to meet the individual needs of the student body. It is anticipated that enrollments will continue to grow as more individuals recognize the need of a college education for attainment of job entry skills or for the purpose of up-grading present capabilities.

In the fall of 1965 the Board of Trustees purchased a tract of land located between Ann Arbor and Ypsilanti. Educational specifications for a new campus have been written, and construction on several buildings will begin in the near future. In the meantime, college classes will continue in renovated quarters in Willow Run, the Automotive Center located on Carpenter Road, and the Health Science complex which is operated in conjunction with several medical facilities in Ann Arbor. The college seeks to develop courses of study which will meet the needs of students, as well as provide the necessary skills needed by area business, industry, and governmental units. With this in mind, a variety of new courses are offered for the first time in the 1967-68 college year.

The Students

Washtenaw Community College grants admission to students from a wide range of backgrounds. The student body is diversified in many ways. Student ages range from 17 to 55, and 33% of enrollees are over 21 years of age. Currently, twice as many men are attending the college as women. Approximately 50% of all student are enrolled in occupational courses, while the other students have elected transfer and general education courses.

The Faculty

Members of the Community College faculty have a fierce commitment to outstanding teaching and counseling. Staff members have developed procedures to insure that each student receives ample qualified assistance, understanding, and information related to specific occupational goals. In addition to the time spent

in preparation and teaching, teacher-counselors assist students with the challenges of their courses and adjustment to college.

Classes are deliberately kept small to promote effective teacher-student relationships. Approximately 75 full-time faculty members are available for presentation of a great variety of courses.

The Board of Trustees has continued to enlist the assistance and support of citizens to plan and develop the college program. This advice has enabled Washtenaw Community College to develop a wide range of technical, industrial, and semi-professional courses as well as college transfer courses of study at an accelerated rate. The names of individuals serving in an advisory capacity are listed throughout the catalog in conjunction with course offering announcements.

Objectives of the College

It is the intention of this College to open the doors of educational opportunity to students with a seriousness of purpose and an ability sufficient to profit from selected instruction. It is our intention that the College should be more interested in what the student is ready to do than in what he has done; that an applicant should have the opportunity to undertake those programs of instruction offered by the Community College for which he is properly prepared and for which he has aptitude and ability. Once enrolled, however, each student should demonstrate satisfactory performance; there should be no compromise with quality.

It is the objective of the College to develop:

1. One and two-year vocational, technical, and semi-professional education programs of organized, systematic instruction, designed to prepare individuals for employment.
2. A two-year general educational program for the social, cultural, and personal development of individuals desiring to continue their education beyond high school.
3. General educational and pre-professional programs, both one and two-years, transferrable to other colleges and universities.
4. Courses or complete programs which meet the cultural and vocational needs of adults.
5. College preparatory and developmental courses for adults and for those who need to make up deficiencies for college level work.
6. Personnel services including counseling for students of all backgrounds and abilities which will assist them in selecting courses of study appropriate to their capabilities and ambitions, and guidance in attainment of their educational goals.

ACCREDITATION

Washtenaw Community College is approved by the State Department of Education, State of Michigan. The College is a member of the Council of North Central Junior Colleges, the Michigan Association of Junior Colleges, and an institutional member of the American Association of Junior Colleges.

A student who plans on transferring to a baccalaureate-degree granting institution after completing the first two years of a four-year course can be confident that the college parallel credits earned at Washtenaw Community College will transfer.

The College has received written statements from admissions officials of four-year colleges and universities in Michigan stating that transfer students will be accepted and that transfer credit will be granted to students who have successfully completed applicable courses at Washtenaw Community College.

Immediate steps have been taken to meet nationally accepted accreditation requirements. Communication with the regional accrediting agency, North Central Association of Colleges and Secondary Schools, has led to immediate compliance with initial accreditation requirements. The North Central Association has assigned a consultant to the College who will meet periodically with the Board, administrators, and teaching faculty. This process will facilitate full accreditation in the shortest time possible.

STUDENT SERVICES

The Student Services staff assists with counseling, student-initiated activities, financial aids, job placement, admissions, and registration.

Counseling

The entire faculty of Washtenaw Community College has a major commitment to help each individual student pursue a course of study planned to fulfill his goals. In order to accomplish this, teacher-counselors are committed to assisting students on an individual basis. Students are encouraged to confer with their teacher-counselor when problems or questions arise.

In addition to the assistance provided by the teacher-counselors, full-time counselors are available at the Counseling Office in the Student Center. Each student entering the College is assigned to a counselor who will discuss his future educational and vocational goals and plan his initial program of classes at the College.

Counselors aid students in clarifying their vocational objectives. Interest inventories can be administered and reference made to the extensive occupational information which is available to students. In order to aid the student in planning for his future education, an extensive collection of college catalogs is maintained in the Counseling Office.

The professionally trained counseling staff will work with students experiencing personal or emotional problems or may refer them to the appropriate agency or service for specialized assistance.

All full-time students are required to take the American College Test (ACT) before their credentials are complete. Results of these tests are interpreted to students and used by counselors in helping students select appropriate classes. The test is not required for admission to the College.

All students are encouraged to utilize the services provided by their counselors. Counselors are available for all part-time, full-time day, and extended-day students at the College.

Orientation

Seminars are conducted by faculty and staff members to assist students in their adjustment to the College, world of work, and other aspects of contemporary living. In these small groups, opportunities are provided for discussion of current problems. Through the seminars students are encouraged to develop personal contacts with College staff members.

Full-time students are required to participate in the seminars for which one hour credit may be earned.

Job Placement

Assistance is provided students completing occupational programs to secure employment appropriate to their training at the College. Contact with business and industry in the area is maintained by teacher-counselors in Occupational Studies as well as the job placement office in Student Services.

For students seeking part-time employment a record of available positions is maintained in the job placement office.

Trustee Awards

The Board of Trustees of the College has authorized the granting of a number of Trustee Awards to students in need of financial assistance who might otherwise not be able to attend the College. The Awards covering the expense of tuition are administered by the Scholarship Committee through the Office of Student Services.

Financial Assistance

Scholarships and financial assistance for students have been provided by:

Washtenaw Asphalt Company
Kiwanis Western of Ann Arbor
Ypsilanti Jaycees
Junior Chamber of Commerce Auxiliary of Ann Arbor
Delta Sigma Theta Sorority, Inc., Ann Arbor Alumnae Chapter
Ann Arbor-Ypsilanti Altrusa Club
Welcome Wagon of Ann Arbor
Ann Arbor Lions Club
George O. Ross Memorial Fund
The Thrift Shop Association of Ann Arbor
Delta Psi Omega Chapter of Alpha Kappa Alpha Sorority

The awarding of a scholarship or financial aid is based on need. Students needing financial assistance should apply to the Dean of Student Services in the Administration Building prior to registration.

The College has been approved for participation in the College Work-Study Program. Students who need to earn part or all of their college expense will be able to work on jobs related to their choice of occupational study. Part-time employment in public and non-profit agencies and organizations in the community or on the college campus will be provided through this program.

Counselors will attempt to help each student in need to find a way to get financial assistance: loans, scholarships, Trustee Awards, and placement in part-time jobs.

Under the Michigan Higher Education Assistance Authority, state scholarships are available. Resident students of Michigan are permitted to write a competitive examination to fulfill the

objective of earning a state scholarship. High school students may obtain a brochure outlining the M.H.E.A.A. program from their counselors.

Graduates of Washtenaw Community College are eligible to apply for a variety of Community College Scholarships granted by many of the four-year colleges and universities.

Veterans' Eligibility

Prospective students who are eligible for veterans' benefits should follow the procedure below:

1. Make application for veterans' benefits at the Veterans Administration Regional Office in your area.

   The College recommends that each prospective student take advantage of the counseling service available to him at the regional office.

   Immediately upon receipt of an application, the V.A. will mail to the veteran an acknowledgment of Receipt of Claim which will provide the veteran with his claim number.

   After processing the veteran's application the regional office will, if the veteran is eligible, issue a Certificate of Eligibility. The certificate is valid only at the institution named and only for the objective indicated.

2. The prospective student should bring the Certificate of Eligibility to the Registrar's office at the time of initial registration.

Student Activities

The College encourages student activities which supplement the instructional program by providing recreational activities which will add to the student's enjoyment of life and stimulate his personal growth and social development. Opportunties for development of constructive leadership, cooperative planning, and special interests will be fostered through participation in student activities. All student activities are coordinated through the Office of Student Activities in the Student Center.

Student Government

A Student Senate has been organized and officers elected. The Senate is responsible for student government at the College and promotes the ideals of intelligent self-direction and encourages the spirit of unity and cooperation in student activities.

Intramural Athletics

Students will be instrumental in determining which athletic activities will be available and appropriate as to season and objective. Participation in intramural athletics is entirely voluntary. Opportunities for the active participation of men and women are provided.

The activities provided by a comprehensive intramural program constitute an effective means of maintaining interest in all-around physical fitness, establish standards of excellence in physical efficiency, afford experience in emotional control, and provide opportunities to think and act while under the pressure of strong competition. Activities provide a wholesome and natural interest as a focal point for college loyalties and institutional spirit. Students are encouraged to become active in intramural sports.

Student Organizations

Responding to student interest, groups of students are organizing activity clubs with the assistance of the Office of Student Activities. Such groups include the Ski Club, Vets Club, Model U.N., and cheerleaders among others.

Participation in the organizations will enable students to discover friends and identify activities compatible with their interests and aptitudes. Service clubs, hobby clubs, professional groups, and organizations related to occupational preparation, under the sponsorship of faculty members, will be available to all students.

Student Publications

THE VOICE is the official College newspaper. It is published by the students in conjunction with journalism instruction. Students interested in the newspaper may participate in the writing and editing of THE VOICE by contacting the faculty sponsor.

RESERVE OFFICER TRAINING CORPS INSTRUCTION

Through the cooperation of Eastern Michigan University the College has arranged for students in a college transfer program to register for Army ROTC instruction. A guest student fee is charged by Eastern for the course. The instruction is provided by the Military Science Department.

The two-year program will be given credit at the College and will be recognized by ROTC units at other institutions to which the student may transfer.

Students interested in the program may secure additional information from the Counseling Office.

Housing

Washtenaw Community College is primarily an institution for commuting students; therefore, no dormitory facilities are provided. Students who require accommodations should contact the Office of Student Services.

Bookstore

The College will serve the student body and enhance the instructional program through the bookstore.

Books, instructional aids, equipment, materials, and supplies are readily accessible in the Student Center for students and staff. Costs will be kept to a minimum based on the College goal of service to students.

Student Center

The community center at the College is frequented by all members of the College family — students, faculty, administration, staff, and guests. A lounging area adjoins the food service area where light lunches and snacks are provided by vending machines.

Learning Materials Center

Library and Audio-Visual complex are incorporated into the Learning Materials Center to provide faculty and students with greater access to all forms of educational material.

The library contains a large collection of books and periodicals dealing with all subject fields. The library's physical format is arranged to provide a pleasant, relaxed area for individual study through carrels, or alcove studying.

By means of inter-library loans, the library is able to supplement the Learning Materials Center's collection by borrowing material from the Michigan State Library to assist students with special research assignments.

Students are urged to acquaint themselves with the regulations which have been established for the interest of all who use the library.

Photocopying services at a nominal rate are available in the Learning Materials Center to provide copies of particular useful items needed to supplement research papers.

For students interested in listening to background music while they study, the Audio-Visual department maintains a collection of tape recordings that can be used whenever time permits. Stereophonic tape recorders are available for their use and are equipped with stereo earphones so they can listen and learn from tapes of classroom lectures, plays, readings, and many other educational recordings. Other educational materials are made available for students to use to make their learning more effective. A preview room is available for viewing 8mm and 16mm films that are used in lectures and assigned by teachers. Filmstrips can be studied in the library with the aid of individual viewers and are cataloged at the request of the faculty.

There is a need each semester for student assistants to work in the Audio-Visual department as projectionists, recording technicians, graphic artists, and production assistants.

RESIDENCY POLICY

Educational costs at Washtenaw Community College are based on a sharing by the student, the taxpayer of the district, and the state. District taxes supplement student tuition and state aid for **in-district** students; therefore, the tuition charged the student who lives outside the college district but within the state is greater than the tuition charged the in-district student. Students who reside out-of-state are charged the highest tuition.

In-District Resident

A student who lives in the Washtenaw Community College District with his parents or legal guardian.

Out-of-District Resident

A student who lives outside the college district or whose parents reside outside the college district, but who is a resident of the state, is classified as an out-of-district student and will be charged the applicable tuition.

Out-of-State Resident

A student who is a resident of, or whose parents reside in, another state is classified as an out-of-state student for tuition purposes.

ADMISSIONS

ADMISSIONS ELIGIBILTY AND PROCEDURES

Students may apply for admission to one of the following periods:

1. First Semester — begins in September
2. Second Semester — begins in February
3. Summer Session — begins in June

Admission Eligibility of First-Time Students

Students must have completed high school or its equivalent, as determined by the College.

1. Non-graduates of high school, 18 years of age or older, are eligible when:
   a. A student submits an equivalency diploma, or
   b. A student can profit from instructional programs for which he has the proper background, experience, and capability.
2. The prospective student must take the **American College Test** (ACT) sometime during the year preceding his initial registration. Scores are used for placement and counseling purposes and do not determine eligibility for admission.

Admission Procedure for First-Time Students

1. An entering student must request the following forms from his high school counselor or principal.
   a. An application form including a transcript of the high school record. Application forms and college catalogs can be requested directly from the College Registrar's Office.
2. A non-refundable application fee of $10 is required of all applicants who wish to enroll for nine credit hours or more (normal freshman load is 15 credit hours). A check or money order should accompany the application.
3. The College uses the Social Security number as the student's individual identification and this must appear on the application.
4. The results of the American College Test (ACT) must be forwarded to the College.
5. A statement of the student's general health is required prior to admission.

When the above procedure has been completed, the applicant will be notified of his admission status.

Admission Eligibility of Transfer Students

1. Students whose grades at other colleges and universities averaged a 'C' (2.0) or better will be admitted in good standing.
2. Students whose grades at other colleges and universities averaged below a 'C' (2.0) may be conditionally admitted as determined by the College Registrar.

Admission Procedure for Transfer Students

1. The student should mail the completed Application for Admission form and check or money order to the Registrar's Office.
2. If he intends to enroll for nine credit hours or more, a $10 application fee is also required. A check or money order for this amount should accompany the application.
3. Fill in name and address on the Michigan Uniform Secondary School Personal and Scholastic Record form and mail it to the high school you attended. Request them to complete the form and mail it to the Registrar's Office.
4. The student should request each of the colleges he has attended to send a complete transcript of his record to date. If he is presently enrolled, request that another official transcript of his record be forwarded immediately upon completion of the present semester's work. Transcripts must be sent from each college directly to the Registrar's Office.
5. The College uses the Social Security number as the student's individual identification and this must appear on the application form.
6. It is requested that students who have taken the ACT test forward a copy of the results to the College Registrar's Office.
7. A statement of the student's general health is required prior to admission.

When the above procedure has been completed the applicant will be notified of his admission status.

Counseling and Registration

Counseling — At the time the applicant is informed of his admission status he is requested to arrange an appointment with a College counselor to plan his academic program.

Registration — Prior to the beginning of the semester, each student will receive registration information and a scheduled period for registration. Full tuition fees are to be paid at registration.

TUITION AND FEES

Tuition

In-District Resident:

$100 per semester
$ 9 per credit hour for part-time students

Michigan, Out-of-District Resident

$200 per semester
$ 18 per credit hour for part-time students

Out-of-State Resident:

$300 per semester
$ 27 per credit hour for part-time students

Courses, varying in length from several clock hours up to a semester (eighteen weeks), will be offered for part-time, adult students. Tuition for these courses will be determined by the subject content and the length of the course.

Fees

Application fee $10

A non-refundable fee paid at the time of admission. Required of all students who intend to register for nine (9) credit hours or more. (Normal student load is fifteen (15) credit hours.)

Late registration fee ..... $ 5

Refunds

Refund of seventy-five percent of tuition will be made to students who withdraw from the College during the first 10 days of classes. No tuition refunds will be made after the first 10 days of classes. The $10 application fee is not refundable.

This policy also applies to the part-time student.

No refund will be made if a student drops a partial course load at any time.

GENERAL REGULATIONS

Students entering college for the first time will need to be reminded of the added responsibilities of the college environment.

The College must have a minimum number of rules if its objectives are to be accomplished. Regulations are based upon respect for the rights of others and observance of civil and moral laws. All who enroll in Washtenaw Community College must realize that success rests upon personal efforts, attitudes, honor, integrity, and common sense; that attendance at this institution is a privilege.

Credit Hours

Normally, one credit hour is earned by attending a non-laboratory class for a fifty minute period, once a week, for an eighteen-week session. In a laboratory course, one credit hour is granted for, from two to four, fifty minute periods per week in a laboratory.

Course Load

The normal course load for a full-time student is 15 credit hours or more. Special permission must be obtained from the Dean of Student Services to register for more than 18 credit hours unless the course of study necessitates more than 18 credit hours. A full-time course load for the summer session is six to eight credit hours. Special permission must be obtained from the Dean of Student Services to register for more than eight credit hours.

Employed students should consult with a counselor about their course load.

Classification of Students

Full-time — a student who carries twelve or more credit hours.

Part-time — a student who carries less than twelve credit hours.

First year (Freshman) — a student who has completed fewer than twenty-eight credit hours.

Second year (Sophomore) — a student who has completed twenty-eight or more credit hours, but has not received an associate degree or has not qualified for upper division classification in a four-year college or university.

Special — a student who is enrolled for courses but is not pursuing a degree or certificate of achievement.

Attendance

1. It is consistent with the college philosophy that regular class attendance is necessary if a student is to receive maximum benefits from his work. Students are expected to attend all sessions of the classes for which they are regis-

tered. The individual teacher-counselor may determine that the quality of the student's work has been adversely affected by absence or tardiness.

2. Students should explain the reason for absence to their teacher-counselors.
3. It is the responsibility of the student to make up work missed because of any absence.
4. Students, in order to receive credit in a course, are required to be present at examinations.

Adding Courses

Students are expected to complete the courses for which they are registered. However, if a student must add a course during the first four contact hours of a course — or during the first 20 contact hours in the Technical and Industrial Division — he must report to the Registrar's Office and complete an Add form.

Courses cannot be added after the twentieth contact hour in the Technical and Industrial Division or the fourth contact hour in all other divisions. (A contact hour is an hour during which the class meets. A three credit course would meet three times a week for one hour each; each hour is one contact hour.)

Withdrawals

Withdrawals from class

A student may formally withdraw from a course up to and including the week following the midterm evaluation. The letter 'W' (withdrawal) will appear on his record.

If a student withdraws from a course after this time (i.e. the week following the midterm evaluation) without sufficient reason, the letter 'X' (withdrawal-failing) will appear on his record. If the teacher-counselor thinks there is sufficient reason for the student's withdrawal after this time, the letter 'W' (withdrawal) will appear on the student's record.

Withdrawals from college

A full-time student who wishes to withdraw from college before the end of the semester or session must confer with his teacher-counselor and have an interview with a counselor in the Student Services Office. He must complete a Withdrawal Request from the Student Services Office. Unless a student fulfills the procedures outlined for withdrawal from college, his current grades are recorded as 'F's.

Dismissal

In the case of a violation of a serious nature, or in case of a repetitive pattern of irregular conduct, a student may be dismissed from the college.

Grading

A system of evaluation and a means of letting the student know the degree of progress he is making can be achieved in numerous ways. One means is by testing, assigning of grades, completion of credit hours, and accumulation of grade points. Honor points or grade points measure the achievement of the student for the number of credit hours he has attempted.

Grades	Grade points per credit hour
A — superior	4
B — excellent	3
C — average	2
D — inferior	1
F — failure	0
S — satisfactory	
U — unsatisfactory	
I — incomplete — credit withheld	
X — withdrawal — failing	
W — withdrawal	

In developmental courses (numbered 40 and below) the evaluation of a student's performance will be by the grade of 'S' (satisfactory) or 'U' (unsatisfactory). Honor points will not be given for these grades. However, the credits for these courses will count toward the Certificate of Achievement if appropriate to the program.

Students who enroll in college for the first time usually are not familiar with the terms grade points and grade-point average.

Grade points are determined by multiplying the grade points per credit hour by the credit hour value of the course attempted. The following example will enable the student to compute his grade-point average.

Classes	Credit Hours Attempted	Grade	Grade Points
English	3	B	3 grade points (3 x 3) = 9
History	3	F	0 grade points (0 x 3) = 0
Mathematics	3	C	2 grade points (2 x 3) = 6
Electronics	2	A	4 grade points (4 x 2) = 8
Physics	5	C	2 grade points (2 x 5) = 10
Physical Education	1	D	1 grade point (1 x 1) = 1
	17		34

Divide the total grade points by the total credit hours attempted — 34 divided by 17 = 2.00 grade point average.

The cumulative grade-point average is the total number of grade points earned divided by the number of credit hours attempted. It includes the number of credit hours of 'F', even though no grade points are allowed for this grade. When a course is repeated, the original grade and the number of credit hours attempted are not removed from the student's permanent record.

The repeated course and the second grade received in the course are entered on the student's permanent academic record, but the credit hours attempted are only entered on the permanent record for the initial enrollment.

Grade reports are issued at mid-semester, at the end of each semester, and each summer session. The mid-semester grade is an indication of student progress and does not become a part of his permanent record.

All grade reports are mailed to the home address of the students, both mid-semester and final reports.

Examinations

Final examinations are scheduled during the times and on the days listed on the examination schedule. A student who is absent from the final examination receives a grade 'I' for the course or courses involved.

Honors

The names of all full-time students earning a grade point average of 3.0 or better during a semester are posted as the Dean's List.

Graduation Requirements

To receive the ASSOCIATE DEGREE a student must:

1. Complete a minimum of sixty credit hours (the last fifteen must be earned at Washtenaw Community College), including specific subject matter or course requirements of the selected program. Certain programs may require more than the minimum of sixty credit hours — these must also be completed.
2. Earn a minimum cumulative grade point average at Washtenaw Community College of 2.0.
3. Complete three credit hours of English.
4. Complete three credit hours of political science. (State of Michigan legal requirement.)
5. File an application for graduation during registration for the final semester.
6. Participate in graduation exercises.

To receive the CERTIFICATE OF ACHIEVEMENT a student must:

1. Complete a minimum of thirty credit hours (the last fifteen must be earned at Washtenaw Community College), including specific subject matter or course requirements of the selected program. Certain programs may require more than the minimum of thirty credit hours — these must also be completed.
2. Earn a minimum cumulative grade point average at Washtenaw Community College of 2.0.

3. Complete three credit hours in speech or English.
4. File an application for graduation during registration for the final semester.
5. Participate in graduation exercises.

Commencement ceremonies for Washtenaw Community College graduates are held in the month of June. The conferring of associate degrees, certificates of achievement, and honors highlight the graduation exercises. Students receiving associate degrees and certificates of achievement are required to participate in the commencement.

Graduation Honors

A student is graduated with **Honors** if he has completed his curriculum (Associate Degree and/or Certificate of Achievement) with a 3.0 cumulative grade point average.

A student who plans to graduate must complete the appropriate form in the Registrar's Office at the beginning of the semester in which he plans to complete his course work. Requirements may be completed during any semester or summer session.

Certificate of Completion

The College will offer many short courses, conferences, work shops, and seminars. These will vary in length from one or two meetings of short duration to units necessitating many clock hours accumulated over a period of several weeks.

Successful completion of Community Service Offerings of this type will result in granting of a Certificate of Completion.

Request for Transcript

A student who wants a transcript of his grades sent to an educational institution or to a prospective employer must complete the appropriate form in the Registrar's Office. There is no charge for the first transcript; there is a service charge of $1 for each additional copy. A transcript is issued only after the student has fulfilled all financial obligations to Washtenaw Community College.

COURSE NUMBERS

Courses numbered 40 and below are Developmental Courses.

1. The first digit of a course number indicates its classification according to the year it should be taken.
   a. Courses numbered 100 to 199 are freshman-level courses which should be taken during the first year of college, as they usually are pre-requisite courses.
   b. Courses numbered 200 to 299 are sophomore-level courses which should be taken during the second year of college.

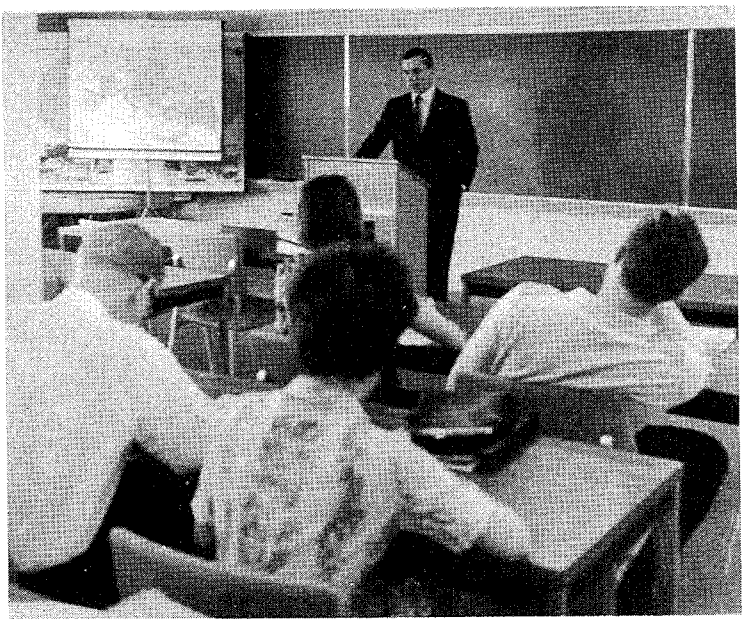
2. The second digit of the course number indicates the semester the course usually is offered: 1, first semester; 2, second semester; 0, 3, 4, 5, 6, 7, 8, or 9, either semester.
3. The third digit of the course number indicates the number of the course in a sequence: 1, 2, 3, 4, 5, or 6. For numbers 0, 7, 8, 9, there is no sequence involved.

PHYSICAL EDUCATION

Initially physical education will be offered as an elective. Those students wishing to take fitness or conditioning physical education may do so.

The use of existing facilities to house Washtenaw Community College will restrict offering a diversified physical education program the first two or three years. Therefore, only those students who wish to participate or those students who plan on transferring to a four-year institution and must have physical education as a required course will elect the course.

Students should consult with counselors in the Counseling Office at the Student Center to see if their transfer program requires physical education.



GENERAL STUDIES PROGRAMS

Students who intend to transfer to a four-year college or university after acquiring the necessary earned credits at Washtenaw Community College should review the general requirements presented in the following programs.

The curricula as outlined are to serve as guidelines only. Each college and university has developed its specific criteria for the many programs of study. The student is advised to review the particular college catalog with his counselor in order to determine course schedules. A file of both state and out-of-state catalogs is available in the Student Services Office. Proper selection of courses is requisite to the orderly transfer of credits from Washtenaw Community College to the baccalaureate degree-granting institution.

ARTS

The following pattern of courses for students concentrating in Liberal Arts, Education, Literature, or Business Administration is one which meets the requirements of the first two years of work in most four-year colleges and universities.

FIRST YEAR

First Semester	Hours	Second Semester	Hours
English	3	English	3
United States History	3	United States History	3
Foreign Language	4	Foreign Language	4
Political Science**	3	Social Science**	3
Art Appreciation	3	Music Appreciation	3
Orientation	1		
	17		16

SECOND YEAR

First Semester	Hours	Second Semester	Hours
Literature	3	Literature	3
Mathematics	3	Mathematics	3
Foreign Language*	4	Foreign Language	4
Biological Science or Physical Science	3 or 4	Biological Science or Physical Science	3 or 4
Elective***	3	Elective	3
	16 or 17		16 or 17

*Most liberal arts curricula require the completion or the equivalent of two years college credit in a foreign language.

**Political Science (needed to meet State requirements), history, sociology, economics, general psychology, geography.

***Speech, science, mathematics, and art.

SCIENCE

The following pattern of courses for students concentrating in the Sciences, Forestry and Conservation, Mathematics, Education, Engineering, and the several medical fields is one which meets the requirements of the first two years of work in most four-year colleges and universities.

FIRST YEAR

First Semester	Hours	Second Semester	Hours
English	3	English	3
Mathematics	3	Mathematics	3
Science (Laboratory)	4	Science (Laboratory)	4
Political Science**	3	Social Science**	3
Speech (Fundamentals of)	3	General Psychology	3
Orientation	1		
	17		16

SECOND YEAR

First Semester	Hours	Second Semester	Hours
Mathematics	3 or 4	Mathematics	3 or 4
Science (Laboratory)	4	Science (Laboratory)	4
Foreign Language*** or Literature	4 or 3	Foreign Language*** or Literature	4 or 3
Social Science	3	Social Science	3
Elective****	3	Elective****	3
	17		17

*Pre-engineering students can fulfill engineering drawing requirements by taking Technical Drawing 100, Drafting 111 and/or Descriptive Geometry 112.

**Political Science (needed to meet State requirements), history, sociology, economics, geography.

***If foreign language is required, the completion of two years of college credit or its equivalent is suggested.

****Art appreciation, music appreciation.

GENERAL EDUCATION

The general education program is especially suited for those students who wish to gain broad understandings in various content fields and are not concerned specifically with acquiring job-entry skills, or securing college-parallel credit. The basic purpose of the following course guidelines is the intellectual, cultural, and personal development of an individual.

FIRST YEAR

First Semester	Hours	Second Semester	Hours
English	3	English	3
Mathematics or Science	3 or 4	Mathematics or Science	3 or 4
Political Science*	3	Social Science	3
Foreign Language or Elective**	4 or 3	Foreign Language or Elective**	4 or 3
Music or Art Appreciation	3	Music or Art Appreciation	3
Orientation	1		
	17		16

SECOND YEAR

First Semester	Hours	Second Semester	Hours
Literature	3	Literature	3
Social Science	6	Social Science	6
Art or Music	3	Art or Music	3
Foreign Language or Elective**	4 or 3	Foreign Language or Elective**	4 or 3
	15 or 16		15 or 16

*Political Science required for Associate Degree and to meet State requirements.

**Essentially, any course listed in the several divisions of the college may be elected.

BUSINESS AND INDUSTRIAL MANAGEMENT INTERNSHIP — EXTERNSHIP PROGRAMS

The Division of Business and Industrial Management plans to offer cooperative work-experience programs to interested and qualified students. These programs will be known as the Business and Industrial Management Internship — Externship Programs. They are designed to implement students' academic and occupational education with on-the-job business and/or industrial experience.

The Internship — Externship Programs will involve the students in real-life work experiences specially programmed, through the cooperative effort of the participating firms and a college program coordinator, to meet the students' particular occupational needs.

Interns and externs will be placed in all kinds of business-industrial firms and/or educational and governmental establishments. Work experience will be available through these organizations in the diverse areas of manufacturing, wholesale and retail, office systems and procedures, data processing, and many others.

Student time schedules for the Internship — Externship Programs will be flexible to meet the students' needs. Work-experience assignments may be arranged on a half-day basis, alternate daily work-study combination, or alternatively — a full semester of work and/or study, or a summer work-experience program.

Washtenaw Community College's Business and Industrial Management Internship — Externship Programs will be conducted under the guidance and direction of a regularly designated coordinator. The coordinator, through the divisional director's office, will be directly responsible for the structure of the programs and maintenance of effective liaison between the student, the college, and the participating firm; and evaluation of the intern's and/or extern's total progress.

SPECIAL BUSINESS AND INDUSTRIAL MANAGEMENT COURSES AND PROGRAMS

In addition to its regularly scheduled occupational programs and courses, the Division of Business and Industrial Management has projected plans for the development of specialized short course and program offerings (seminars, workshops, series of sessions, etc.) to meet the explicit needs of the business and industrial firms in the immediate environs of Washtenaw Community College.

DIVISION OF BUSINESS AND INDUSTRIAL MANAGEMENT

BUSINESS AND INDUSTRIAL MANAGEMENT ADVISORY COMMITTEE

J. P. Barnum, Branch Manager
International Business Machines Corporation
Dearborn

Miss Elizabeth A. Bliss (C.P.S.)
Secretary, Supervisor of Placement Office
The University of Michigan Law School
Ann Arbor

Roger A. Gatward, Manager
Manpower, Incorporated
Ann Arbor

Robert F. Guise, Jr., President
Com-Share, Incorporated
Ann Arbor

Henry J. Kruzel, Senior Industrial Relations Analyst
Compensation Administration Section
Lincoln-Mercury Division
Ford Motor Company
Dearborn

William Marsh, General Manager
Rockwell-Standard Corporation
Chelsea

Wilbert M. Remington, Director
Data Processing Division
Detroit Edison Company
Detroit

James R. Smith, Manager
Hourly Employment
Hydra-matic Division
General Motors Corporation
Ypsilanti

Earl W. Taylor (C.P.A.)
Alam and Taylor
Ann Arbor

Faculty Coordinator: Arthur J. Lamminen

ACCOUNTING TECHNICIAN

Two-Year Program

FIRST YEAR

First Semester	Hours
English Fundamentals 91 or English Composition 111	3
Introduction to Business 140	3
Business Mathematics 100	3
Principles of Data Processing 111	4
Orientation	1
	14

Second Semester	Hours
English Fundamentals 92 or English Composition 122	3
Business Machines 130	2
Principles of Accounting 111	3
Fundamentals of Speaking 180	3
Data Processing Applications 122	4
	15

SECOND YEAR

First Semester	Hours
Principles of Accounting 122	3
Principles of Economics 211	3
Business Law 111	3
Introduction to Political Science 100	3
Data Processing Systems and Procedures 213	4
	16

Second Semester	Hours
Intermediate Accounting 200	3
Work Experience 100 or Business Elective	3
Principles of Economics 222	3
Human Relations in Business and Industry 200	3
Office Management 230	3
	15

Employment Opportunities: Successful completion of this course of study can lead to employment as an accountant in a governmental agency, business or industry.

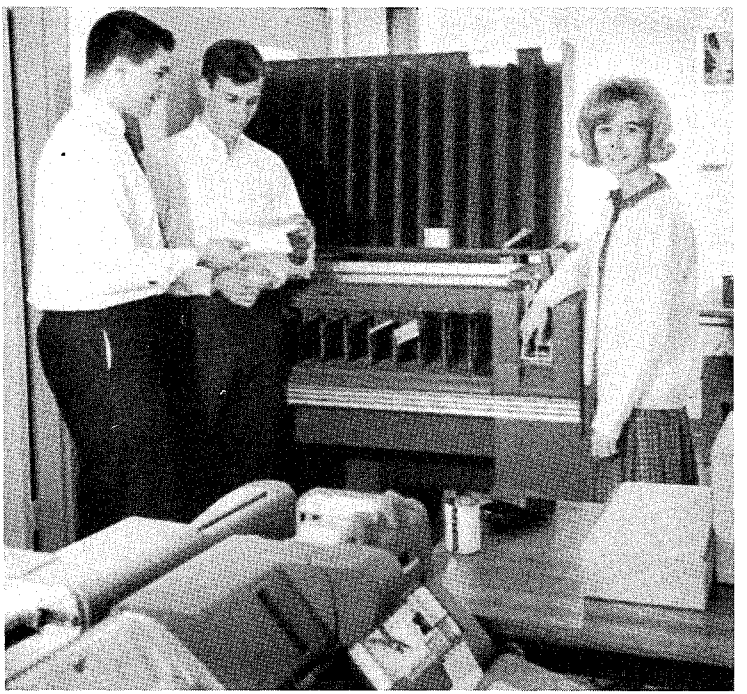
DATA-RECORD OPERATOR

One-Year Program

First Semester	Hours
English Fundamentals 91 or English Compostition 111	3
Introduction to Business 140	3
Principles of Data Processing 111	4
Basic Mathematics 31 or Business Mathematics 100	3
Orientation	1
	14

Second Semester	Hours
Fundamentals of Accounting 30 or Principles of Accounting 111	3
Data Processing Applications 122	4
Fundamentals of Speaking 180	3
Human Relations in Business and Industry 200	3
Work Experience 100 or Business Elective	3
	16

Employment opportunities: Employment by firms handling a large volume of data, reporting, record-keeping and other paperwork. Employment by manufacturing, wholesale and retail, and utility firms as keypunch, sorting machine, or tabulating machine operator. This program may precede courses in programming or systems analysis as related to computer technology.



DATA PROCESSING TECHNICIAN

Two-Year Program

FIRST YEAR

First Semester	Hours	Second Semester	Hours
English Fundamentals 91 or English Composition 111	3	English Fundamentals 92 or English Composition 122	3
Introduction to Business 140	3	Business Machines 130	2
Business Mathematics 100	3	Principles of Accounting 111	3
Principles of Data Processing 111	4	Fundamentals of Speaking 180	3
Orientation	1	Data Processing Applications 122	4
	14		15

SECOND YEAR

First Semester	Hours	Second Semester	Hours
Principles of Accounting 122	3	Office Management 230	3
Principles of Economics 211	3	Work Experience 100 or Business Elective	3
Business Law 111	3	Principles of Economics 222	3
Introduction to Political Science 100	3	Human Relations in Business and Industry 200	3
Data Processing Systems and Procedures 213	4	Computer Programming 224	4
	16		16

Employment opportunities: Entry occupations include data processing applications, data systems and procedures analyses, and computer programming in private business, industrial firms, governmental agencies, and educational institutions.

MANAGEMENT TECHNICIAN

Two-Year Program

FIRST YEAR

First Semester	Hours	Second Semester	Hours
English Fundamentals 91 or English Composition 111	3	English Fundamentals 92 or English Composition 122	3
Introduction to Business 140	3	Business Machines 130	2
Principles of Economics 211	3	Principles of Salesmanship 160	3
Business Mathematics 100	3	Principles of Management 208	3
Fundamentals of Speaking 180	3	Principles of Data Processing 111*	4
Orientation	1		
	16		15

SECOND YEAR

First Semester	Hours	Second Semester	Hours
Principles of Accounting 111	3	Principles of Accounting 122	3
Business Law 111	3	Human Relations in Business and Industry 200	3
Personnel Management 240	3	Business Communication 100	3
Principles of Marketing 250	3	Introduction to Political Science 100	3
Work Experience 100 or Business Elective	3	Work Experience 100 or Business Elective	3
	15		15

*Student may elect additional courses in data-record operations.

Employment opportunities: Supervisory and administrative or managerial trainee opportunities in business or industry.

CLERK TYPIST

One-Year Program

First Semester	Hours	Second Semester	Hours
English Fundamentals 91 or English Composition 111	3	Shorthand 130 (A, B, C) and/or Elective**	3
Shorthand 130 (A, B, C) and/or Elective**	3	Typewriting 130 (A, B, C) and/or Elective*	2
Typewriting 130 (A, B, C) and/or Elective*	2	Office Systems and Procedures 150	3
Basic Mathematics 31 or Business Mathematics 100	3	Business Machines 130	2
Introduction to Business 140	3	Human Relations in Business and Industry 200	3
Orientation	1	Work Experience 100 or Business Elective	3
	15		16

*Typewriting credit and contact hours are progressive in accordance with student progress and proficiency level. (See catalog course description.)

**Shorthand credit and contact hours are progressive in accordance with student progress and proficiency level. (See catalog course description.)

Employment opportunities: Various kinds of businesses and industries, governmental agencies, banks, unions, private offices as typist who performs related duties.

SECRETARY TECHNICIAN

Two-Year Program

FIRST YEAR

First Semester	Hours
English Fundamentals 91 or English Composition 111	3
Introduction to Business 140	3
Shorthand 130 (A, B, C) and/or Elective**	3
Typewriting 130 (A, B, C) and/or Elective*	2
Business Mathematics 100	3
Orientation	1
	15

Second Semester	Hours
English Fundamentals 92 or English Composition 122	3
Business Machines 130	2
Shorthand 130 (A, B, C) and/or Elective**	3
Typewriting 130 (A, B, C) and/or Elective*	2
Fundamentals of Speaking 180	3
Work Experience 100 or Business Elective***	3
	16

SECOND YEAR

First Semester	Hours
Shorthand 130 (A, B, C) and/or Elective**	3
Business Law 111	3
Office Systems and Procedures 150	3
Principles of Accounting 111	3
Work Experience 100 or Business Elective	3
	15

Second Semester	Hours
Business Communication 100	3
Business Law 122	3
Human Relations in Business and Industry 200	3
Principles of Accounting 122	3
Introduction to Political Science 100	3
	15

NOTE: THIS PROGRAM PROVIDES PREPARATION LEADING TO FULFILLMENT OF REQUIREMENTS FOR CERTIFIED PROFESSIONAL SECRETARY (C.P.S.)

*Typewriting credit and contact hours are progressive in accordance with student progress and proficiency level. (See catalog course description.)

**Shorthand credit and contact hours are progressive in accordance with student progress and proficiency level. (See catalog course description.)

***May be continued second year.

Employment opportunities: Business, industry, banks, unions, private offices, and governmental agencies.

WHOLESALE AND RETAIL SALES PERSON

(Distributive Education)

One-Year Program

First Semester	Hours	Second Semester	Hours
English Fundamentals 91 or English Composition 111	3	Principles of Marketing 250	3
Introduction to Business 140	3	Human Relations in Business and Industry 200	3
Principles of Salesmanship 160	3	Business Machines 130	2
Basic Mathematics 31 or Business Mathematics 100	3	Business Law 111	3
Fundamentals of Speaking 180	3	Work Experience 100 or Business Elective	3
Orientation	1		
	16		14

Opportunities for employment: Sales positions in wholesale or retail businesses.

WHOLESALE AND RETAIL SALES TECHNICIAN

(Distributive Education)

Two-Year Program

FIRST YEAR

First Semester	Hours
English Fundamentals 91 or English Composition 111	3
Fundamentals of Speaking 180	3
Business Mathematics 100	3
Introduction to Business 140	3
Introduction to Political Science 100	3
Orientation	1
	16

Second Semester	Hours
English Fundamentals 92 or English Composition 122	3
Principles of Marketing 250	3
Principles of Salesmanship 160	3
Business Machines 130	2
Principles of Management 208	3
	14

SECOND YEAR

First Semester	Hours
Principles of Economics 211	3
Business Law 111	3
Principles of Accounting 111	3
Human Relations in Business and Industry 200	3
Work Experience 100 or Business Elective	3
	15

Second Semester	Hours
Advertising Management 270	3
Principles of Accounting 122	3
Principles of Economics 222	3
Sales Management 260	3
Work Experience 100 or Business Elective	3
	15

Employment opportunities: Sales, supervision, and managerial trainee opportunities in a variety of retail and wholesale businesses.

DIVISION OF
HEALTH
SCIENCES

DENTAL ASSISTING ADVISORY COMMITTEE

Dr. James B. Bush
Professor of Dentistry
The University of Michigan
Ann Arbor

Dr. Frank Comstock
Associate Professor of Dentistry
The University of Michigan
Ann Arbor

Dr. Olin Cox
Ypsilanti

Dr. John Larder
Saline

Dr. Robert Lorey
Ann Arbor

Mrs. Carol Pendlebury
Dental Hygienist
Ann Arbor

Dr. Robert Vandersluis
Whitmore Lake

Dr. Norman Wilner
Dexter

DENTAL ASSISTANT

Two-Year Program

FIRST YEAR

First Semester	Hours
Basic Health Science 141	4
Orientation to Dental Assisting 110	1
Dental Science 111	4
English Fundamentals 91 or English Composition 111	3
Office Systems and Procedures 150	3
Orientation	1
	16

Second Semester	Hours
Physical Science 142	4
Advanced Dental Science 122	4
English Fundamentals 92 or English Composition 122	3
Principles of Operatory Procedures 121	4
Clinical Practice and Work Experience 100	2
	17

SECOND YEAR

First Semester	Hours
Advanced Operatory Procedures 212	4
Principles of Dental Laboratory Procedures 214	3
Dental Materials 203	3
Clinical Practice and Work Experience 100	3
Dental Roentgenology 213	3
	16

Second Semester	Hours
Advanced Dental Laboratory Procedures 225	3
Introduction to Political Science 100	3
Psychology of Adjustment 107	3
Clinical Practice and Work Experience 100	6
Principles of Sociology 100	3
	18

Employment opportunities: The program is designed to prepare students to become direct assistants to dentists in general and specialized practice. In addition to the responsibilities of chairside assisting, the Dental Assistant will have office responsibilities and laboratory duties.

INHALATION THERAPY ADVISORY COMMITTEE

John Burton
UAW-CIO
Ypsilanti

Dr. Thomas J. DeKornfeld
Associate Professor
Department of Anesthesiology
The University of Michigan Medical Center
Ann Arbor

Dr. Jay S. Finch
Department of Anesthesiology
The University of Michigan Medical Center
Ann Arbor

Don E. Gilbert
Chief Inhalation Therapist
The University of Michigan Medical Center
Ann Arbor

Dr. A. J. Klippen, Director
Veterans Administration Hospital
Ann Arbor

Henry J. Morris
Assistant Administrator
St. Joseph Mercy Hospital
Ann Arbor

Robert Richards
Director of Personnel
The University of Michigan Medical Center
Ann Arbor

John Shelton
Chief Inhalation Therapist
St. Joseph Mercy Hospital
Ann Arbor

INHALATION THERAPIST

Two-Year Program

FIRST YEAR

First Semester	Hours
Basic Health Science 141	4
Inhalation Therapy Procedures 111	3
Integrated Mathematics 101	3
Nursing Arts for Inhalation Therapy 113	3
Clinical Practice and Work Experience 100	3
Orientation	1
	17

Second Semester	Hours
Physical Science 142	4
Inhalation Therapy Procedures 122	3
Nursing Arts for Inhalation Therapy 124	3
Introduction to Applied Inhalation Therapy 125	1
Clinical Practice and Work Experience 100	4
	15

SUMMER SESSION

Clinical Practice and Work Experience 100	6
Applied Inhalation Therapy 136	3
	9

SECOND YEAR

First Semester	Hours
Seminar — Inhalation Therapy 219	3
English Fundamentals 91 or English Composition 111	3
Psychology of Adjustment 107	3
Clinical Practice and Work Experience 100	4
	13

Second Semester	Hours
Principles of Sociology 100	3
Introduction to Political Science 100	3
Business Communication 100	3
Clinical Practice and Work Experience 100	4
	13

Employment opportunities: The program in Inhalation Therapy Technology is designed to prepare therapists to work under the supervision of a physician responsible for Inhalation Therapy departments in health service agencies. The therapist operates, maintains, and administers the equipment used in patient care. Employed in hospitals, medical and research laboratories.

This program is being conducted in cooperation with:

St. Joseph Mercy Hospital, Ann Arbor

University Hospital, The University of Michigan Medical Center, Ann Arbor

Veterans Administration Hospital, Ann Arbor

MEDICAL CLERK

(Medical Office Worker)

One-Year Program

First Semester	Hours	Second Semester	Hours
Basic Health Science 141	4	Business Mathematics 100	3
Introduction to Medical Assisting 111	3	Medical Assisting 122	4
English Fundamentals 91 or English Composition 111	3	Office Systems and Procedures 150	3
Typewriting 130	2	Business Machines 130	2
Shorthand 130	3	Clinical Practice and Work Experience 100	3
Orientation	1		
	16		15

Employment opportunities: This program is designed to prepare technicians as first-line assistants to medical record librarians in the medical record department of a hospital, clinic, nursing home, or other health service agency.

MEDICAL SECRETARY

(Medical Office Worker)

Two-Year Program

FIRST YEAR

First Semester	Hours	Second Semester	Hours
Basic Health Science 141	4	Physical Science 142	4
Typewriting 130	2	Medical Assisting 122	4
Business Mathematics 100	3	English Fundamentals 92 or English Composition 122	3
Introduction to Medical Assisting 111	3	Medical Terminology 120	3
English Fundamentals 91 or English Composition 111	3	Shorthand 130	3
Orientation	1		
	16		17

SECOND YEAR

First Semester	Hours	Second Semester	Hours
Introduction to Business 140	3	Clinical Practice and Work Experience 100	3
Shorthand 130	3	Office Systems and Procedures 150	3
Business Machines 130	2	Principles of Sociology 100	3
Introduction to Political Science 100	3	Business Communication 100	3
Psychology of Adjustment 107	3	Shorthand 130	3
Clinical Practice and Work Experience 100	3		
	17		15

Employment opportunities: This course of study is designed to prepare "a girl Friday" to a professional person in the medical field. Employed in hospitals, clinics, physician's offices, etc.

RADIOGRAPHIC TECHNOLOGY (X-RAY) ADVISORY COMMITTEE

Kenneth Crocker
Chief Radiographic Technician
The University of Michigan Medical Center
Ann Arbor

Peter Frick
Chief Radiographic Technician
St. Joseph Mercy Hospital
Ann Arbor

Dr. LaMar J. Hankamp, Radiologist
St. Joseph Mercy Hospital
Ann Arbor

Robert Johnston
Chief Radiographic Technician
Veterans Administration Hospital
Ann Arbor

Dr. William Merchant, Administrator
Veterans Administration Hospital
Ann Arbor

Henry J. Morris
Assistant Administrator
St. Joseph Mercy Hospital
Ann Arbor

Dr. Roger B. Nelson
Senior Association Director
The University of Michigan Medical Center
Ann Arbor

Dr. Robert Rapp, Radiologist
Veterans Administration Hospital
Ann Arbor

Dr. William R. Rekshan, Radiologist
Beyer Memorial Hospital
Ypsilanti

Dr. Walter M. Whitehouse, Radiologist
The University of Michigan Medical Center
Ann Arbor

Faculty Coordinator: Robert Nelson

X-RAY TECHNOLOGIST

Two-Year Program

FIRST YEAR

First Semester	Hours	Second Semester	Hours
Fundamentals of X-ray Technology 111	4	Fundamentals of X-ray Technology 122	4
Applied Physics 91	4	Applied Physics 92	4
Anatomy and Physiology 211	4	Anatomy and Physiology 222	4
Integrated Mathematics 101	3	Medical Terminology 120	3
Clinical Practice and Work Experience 100	3	Clinical Practice and Work Experience 100	3
Orientation	1		
	19		18

SUMMER SESSION

Clinical Practice and Work Experience 100	6

SECOND YEAR

First Semester	Hours	Second Semester	Hours
Principles of X-ray Technology 213	4	Principles of X-ray Technology 224	4
Psychology of Adjustment 107	3	Technical Communications 200	3
English Fundamentals 91 or English Composition 111	3	Clinical Practice and Work Experience 100	3
Introduction to Political Science 100	3		
Clinical Practice and Work Experience 100	3		
	16		10

SUMMER SESSION

Clinical Practice and Work Experience 100	6

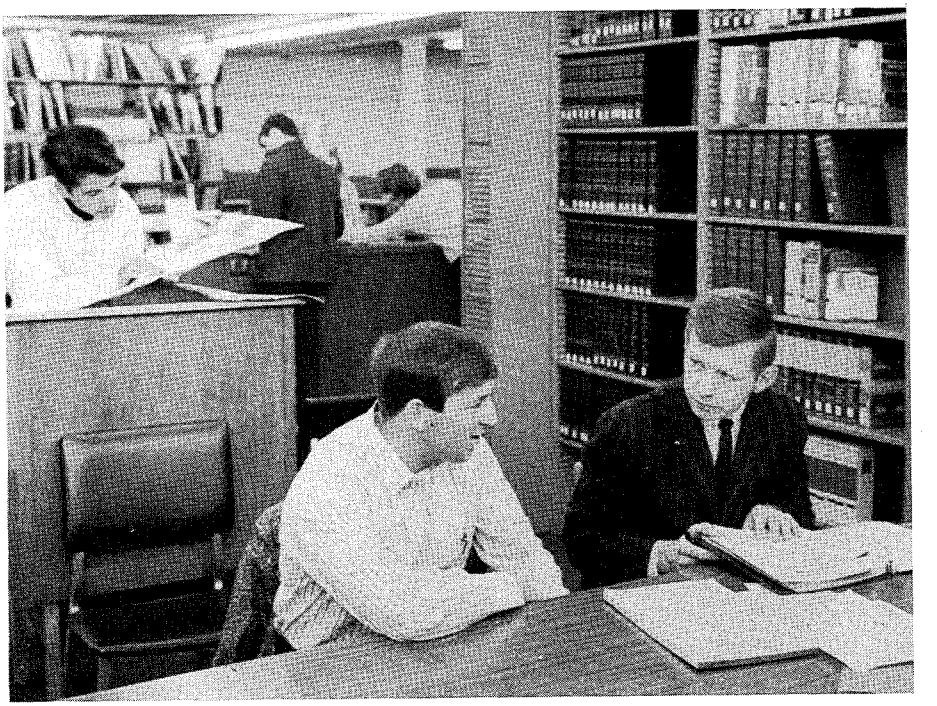
Employment opportunities: The program is designed to prepare students to become safe practitioners in X-ray Technology, who, upon successful completion and certification will perform diagnostic and therapeutic work with their technical skills to use X-ray equipment in both laboratory and clinical settings. Employed in hospitals, clinics, and medical and research laboratories.

This program is being conducted in cooperation with:

St. Joseph Mercy Hospital, Ann Arbor

University Hospital, The University of Michigan Medical Center, Ann Arbor

Veterans Administration Hospital, Ann Arbor



DIVISION OF HOSPITALITY AND COMMUNITY SERVICE OCCUPATIONS

FOOD SERVICE AND COMMUNITY SERVICE OCCUPATIONS

Students who are interested in pursuing occupations in food management, service, and preparation should contact the Divisional Director of Hospitality and Community Service Occupations. Inquiries about occupations related to hotel, restaurant, and the tourist industry should also be brought to the Divisional Director's attention.

Although the college will not be offering full programs related to public safety (police science and fire science) or occupations in education below the baccalaureate level (education technician, audio-visual technician) this academic year, students who are interested in these occupations should discuss their interests with the Director of Hospitality and Community Service Occupations.

LIBRARIAN TECHNICIAN ADVISORY COMMITTEE

Homer Chance
Director
Ann Arbor Public Library

Dr. Walfred Erickson
Head Librarian
Eastern Michigan University

Mrs. Elizabeth Hyde
Elementary Librarian
Ann Arbor Public Schools

Dr. Robert Muller
Associate Director
The University of Michigan Library

Miss Marjorie Tompkins
Assistant to Director
The University of Michigan Library

Mrs. Katharine Waldhorn
Head Librarian
Ypsilanti Public Library

Gene B. Wilson
Reference Librarian
Ann Arbor Public Library

Harold Young
Director
Learning Materials Center
Washtenaw Community College

LIBRARY ASSISTANT

One-Year Program

First Semester	Hours
Library Practice 111	4
Fundamentals of Speaking 180	3
Typewriting 130	2
Business Mathematics 100	3
English Fundamentals 91 or English Composition 111	3
Orientation	1
	16

Second Semester	Hours
Library Technical Processes 122	4
Business Communication 100	3
Typewriting 130	2
Principles of Data Processing 111	3
Introduction to Literature 160 or 170	3
	15

Employment opportunities: Will include assisting librarians with the classifying and cataloging of books and serving clientele in public libraries, particularly in libraries maintained by public and private schools, colleges and universities, government agencies, educational and research associations, and business and industrial firms.

LIBRARY TECHNICIAN

Two-Year Program

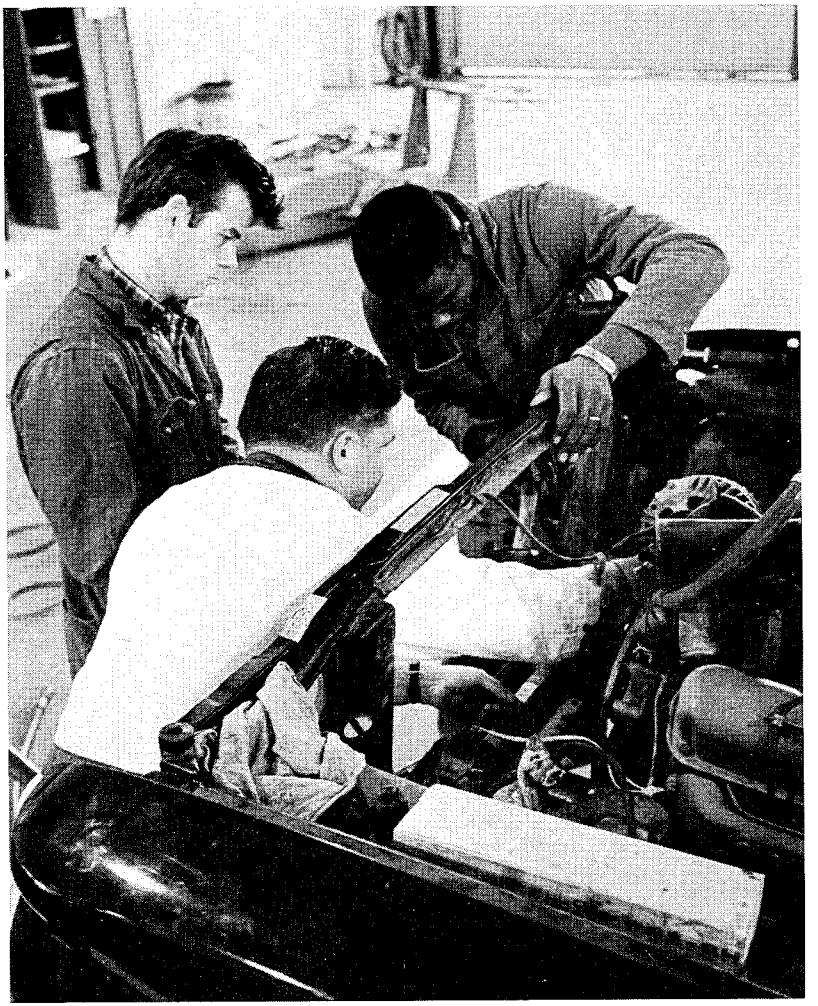
FIRST YEAR

First Semester	Hours	Second Semester	Hours
Library Practice 111	4	Work Experience 100	2
Fundamentals of Speaking 180	3	Library Technical Processes 122	4
Typewriting 130	2	Business Communication 100	3
English Fundamentals 91 or English Composition 111	3	Principles of Data Processing 111	4
Business Mathematics 100	3	Introduction to Literature 160 or 170	3
Orientation	1		
	16		16

SECOND YEAR

First Semester	Hours	Second Semester	Hours
Work Experience 100	4	Work Experience 100	2
Psychology of Adjustment 107	3	Art Appreciation 130	3
Principles of Sociology 100	3	Data Processing Applications 122	4
Introduction to Political Science 100	3	History or Geography (elective)	3
Typewriting 130	2	Office Systems and Procedures 150	3
	15		15

Employment opportunities: See Library Assistant.



DIVISION OF TECHNICAL AND INDUSTRIAL

ARCHITECTURAL DRAFTING ADVISORY COMMITTEE

J. Sterling Crandall (Lecturer)
School of Architecture and Design
The University of Michigan
Ann Arbor

O. S. DeLancy (Practicing Architect)
Lane, Riebe, and Wieland
Ann Arbor

Eugene Field, President
Ypsilanti Fabricating Company, Inc.
Ypsilanti

Zdravko T. Gerganoff (Practicing Architect)
Ypsilanti

John Hunter, President
Porcelain Building Products, Inc.
Ann Arbor

Herbert W. Johe, Assistant Dean
School of Architecture and Design
The University of Michigan
Ann Arbor

Kingsbury Marzolf, Professor
School of Architecture and Design
The University of Michigan
Ann Arbor

Warren E. Poole
Assistant University Architect
The University of Michigan
Ann Arbor

Howard F. Sims (Practicing Architect)
Ann Arbor
Donald F. Wright (Partner)

Colvin, Robinson, Wright & Associates
Ann Arbor

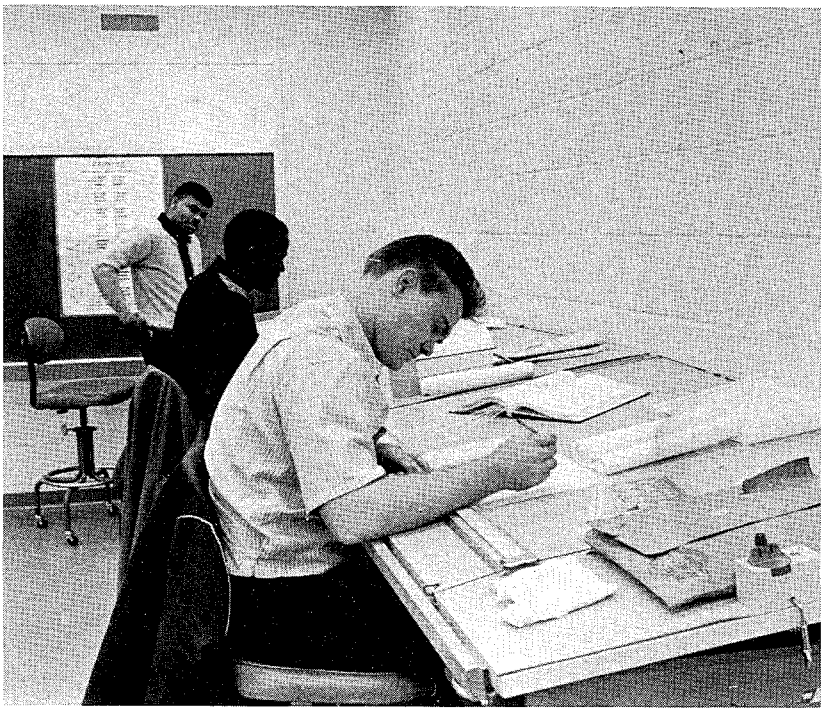
Faculty Coordinator: David R. Byrd

ARCHITECTURAL DRAFTING DETAILER

One-Year Program

First Semester	Hours	Second Semester	Hours
Architectural Drawing 111	5	Architectural Drawing 122	5
Construction Materials 117	3	Mechanical Equipment 120	2
History of Architecture 108	2	Introductory Algebra 40	4
Typewriting 130	2	Human Relations in Business and Industry 200	3
English (elective)	3	Specifications 200	1
Orientation	1	Fundamentals of Speaking 180	3
	16		18

Employment opportunities: Draftsman who does primarily detailing, changes, and tracings of work from architects, builders, contractors, and realtors.



ARCHITECTURAL DRAFTING TECHNICIAN

Two-Year Program

FIRST YEAR

First Semester	Hours
Architectural Drawing 111	5
Construction Materials 117	3
History of Architecture 108	2
English Fundamentals 91 or English Composition 111	3
Typewriting 130	2
Orientation	1
	16

Second Semester	Hours
Architectural Drawing 122	5
Mechanical Equipment 120	2
Algebra and Trigonometry 140	4
Human Relations in Business and Industry 200	3
Fundamentals of Speaking 180	3
	17

SECOND YEAR

First Semester	Hours
Architectural Drawing 213	5
Structure in Architecture 210	2
Estimating Construction Costs 207	3
General Physics 111	4
Surveying 209	3
	17

Second Semester	Hours
Architectural Drawing 224	5
Specifications 200	1
Technical Communication 200	3
Introduction to Political Science 100	3
Psychology (elective)	3
Architectural Rendering 122	2
	17

Employment opportunities: A draftsman who does layout and detailing for architects, builders, contractors, realtors. The very skilled may also do design and presentation work. This program could be the foundation for eventual registration as an architect.

INDUSTRIAL DRAFTING ADVISORY COMMITTEE

Arthur Bartlett
Supervisor of Drafting
Bendix Systems Division
Ann Arbor

Ernest Calabro
Chief Draftsman
Laser Systems Center of Lear Siegler Inc.
Ann Arbor

George Granger
Project Engineer
Ayres, Lewis, Norris & May
Ann Arbor

Howard Meyer
Senior Engineer
Central Fibre Products Co.
Chelsea

Frank J. Mlinek
Assistant Chief Tool Designer
General Motors Corp., Hydra-matic Div.
Ypsilanti

Edward Redies
President
R & B Machine & Tool
Saline

Thomas Ruhe
Supervisor of Design
Ford Motor Company
Ypsilanti

Bruce Tester
Chief Mechanical Engineer
Argus Optics, Division of Argus, Inc.
Ann Arbor

Charles B. Tibbits
Chief Mechanical Engineer
John G. Hoad & Associates Inc.
Ypsilanti

William Tuschak
Chief Draftsman
General Motors Corp., Hydra-matic Div.
Ypsilanti

Faculty Coordinator: Roger R. Bertoia

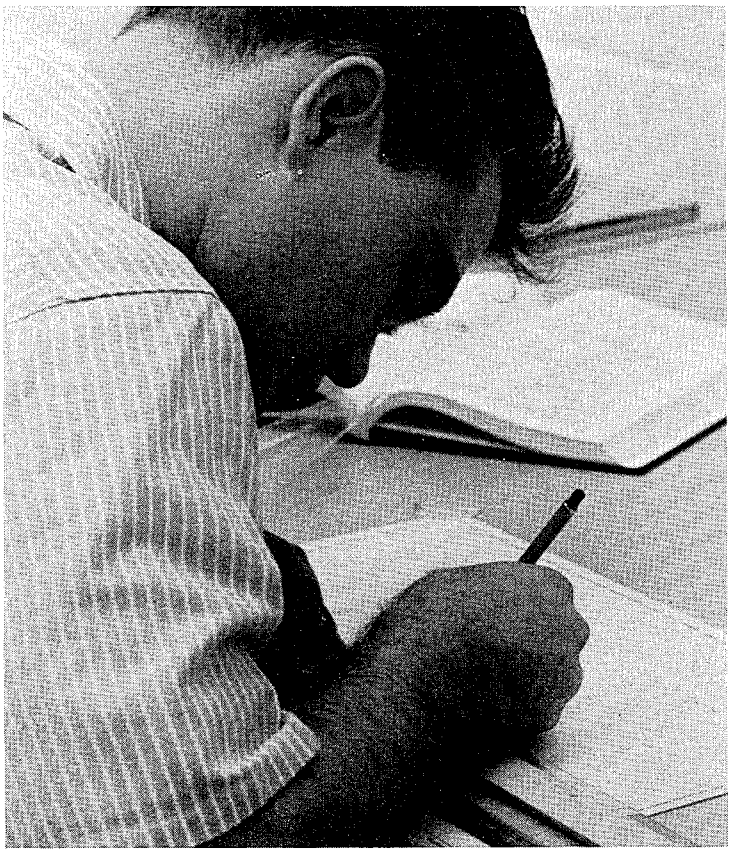
DRAFTSMAN — DETAILER

One-Year Program

First Semester	Hours
Drafting 111	3
Descriptive Geometry 112	3
Perspective and Parallel Line Projection 110	3
Developmental Mathematics 31	3
Shop Orientation 111	2
Blueprint Reading 101	3
Orientation	1
	18

Second Semester	Hours
Fundamentals of Jigs and Fixtures 122	3
Mechanisms 107	3
Fundamentals of Die Drafting 213	3
English or Speech (elective)	3
Shop Orientation 122	2
Fundamentals of Welding and Fabrication 100	2
	16

Employment opportunities: Elementary detailing, tracing, and changing drawings and prints of machine tools, product drawings and other mechanical drawings.



INDUSTRIAL DRAFTSMAN

Two-Year Program

FIRST YEAR

First Semester	Hours	Second Semester	Hours
Drafting 111	3	General Physics 111	4
Blueprint Reading 101	3	Descriptive Geometry 112	3
Introductory Algebra 40	4	Fundamentals of Jigs and Fixtures 122	3
Shop Orientation 111	2	Algebra and Trigonometry 140	4
Power Sources 100	4	Fundamentals of Welding and Fabrication 100	2
Orientation	1	Shop Orientation 122	2
	17		18

SECOND YEAR

First Semester	Hours	Second Semester	Hours
Drafting (elective)*	3	Fundamentals of Industrial Tooling 224	3
Mechanisms 107	3	Industrial Materials 111	3
Fundamentals of Die Drafting 213	3	Introduction to Political Science 100	3
Shop Technology 201	3	Plane and Solid Geometry 98	4
Typewriting 130	2	Drafting (elective)*	3
English Fundamentals 91 or English Composition 111 or Technical Communications 200	3		
	17		16

*Perspective and Parallel Line Projection 110
Architectural Rendering 122
Basic Design 123

Employment opportunties: Detailing, assembly drawings, and some elementary layout drawing. Basic foundation for designers, chief draftsmen, stylists, and supervisors.

TECHNICAL-COMMERCIAL ART TECHNICIAN

Two-Year Program

FIRST YEAR

First Semester	Hours
English Fundamentals 91 or English Composition 111 or Technical Communications 200	3
Basic Drawing 111	3
Basic Design 112	3
Perspective and Parallel Line Projection 110	3
Technical Drawing 100	3
Orientation	1
	16

Second Semester	Hours
Descriptive Geometry 112	3
Basic Design 123	3
Advertising Layout 121	3
Architectural Rendering 122	3
Shop Orientation 111 (or Blueprint Reading 101)	2 or 3
	14 or 15

SECOND YEAR

First Semester	Hours
Study Problems (Seminar) 236	3
Introduction to Political Science 100	3
Photography 214	2
Airbrush Techniques 213	3
Fundamentals of Speaking 180	3
	14

Second Semester	Hours
Study Problems (Seminar) 236	4
Introductory Algebra 40	4
Physical Science 142	4
Shop Orientation 122*	2
Model Construction 225	2
	16

*Suitable Drafting, Blueprint Reading, or other specialty courses may be substituted with the consent of advisor.

Employment opportunities: Book, magazine, newspaper, and medical illustration, mailing pieces and brochures, general advertising and related art areas. Basic foundation for occupational entry in the broad field of illustration.

AUTO BODY REPAIR ADVISORY COMMITTEE

William Brown, Sr.
Brown's Gulf Service
Chelsea

Frank Carter
Carter Auto Repair
Saline

Raymond Deck
Anderson & Deck Service
Ypsilanti

N. B. Nelson
Motors Insurance Corporation
Detroit

Neil Wagner
Dexter Body Shop
Dexter

Owen White
White's Auto Paint Shop
Ann Arbor

Calvin Zahn
Zahn Auto Service
Ann Arbor

Faculty Coordinator: F. E. Belkola

AUTO BODY REPAIRMAN

One-Year Program

First Semester	Hours
Auto Body Repair and Painting 111	6
Fundamentals of Welding and Fabrication 100	2
English (elective)	3
Mathematics (elective)	3
Orientation	1
	15

Second Semester	Hours
Auto Body Repair and Painting 122	6
Welding and Fabrication 111A	3
Fundamentals of Speaking 180	3
Human Relations in Business and Industry 200	3
	15

Employment opportunities: Body repair mechanic and/or painter in a dealership, independent body shop, or maintenance department of a large business or industry.

AUTO BODY REPAIR TECHNICIAN

Two-Year Program

FIRST YEAR

First Semester	Hours	Second Semester	Hours
Auto Body Repair and Painting 111	6	Auto Body Repair and Painting 122	6
Fundamentals of Welding and Fabrication 100	2	Welding and Fabrication 122A	3
English Fundamentals 91 or English Composition 111	3	Fundamentals of Speaking 180	3
Mathematics (course numbered 40 or above)	3	Introduction to Political Science 100	3
Orientation	1	Typewriting 130	2
	15		17

SECOND YEAR

First Semester	Hours	Second Semester	Hours
Body Alignment and Collision 213	6	Body Alignment and Collision 224	6
Collision Estimating 200	3	Human Relations in Business and Industry 200	3
Technical Communications 200	3	Principles of Salesmanship 160	3
Mechanisms 107	3	Auto Air Conditioning 207	3
	15		15

Employment opportunities: Insurance adjuster trainee, manager trainee, automobile body mechanic and/or painter in an automobile dealership, independent body shop, or maintenance department of a large business or industry.

DEVELOPMENTAL TECHNICIAN

Two-Year Program

FIRST YEAR

First Semester	Hours	Second Semester	Hours
English Fundamentals 91 or English Composition 111	3	Introduction to Political Science 100	3
Algebra and Trigonometry 140	4	Mechanisms 107	3
Electrical Fundamentals 111	3	Electrical Fundamentals 122	3
Electrical Applications 110	1	Electrical Applications 120	1
Blueprint Reading 101	3	Blueprint Reading 102	3
Shop Orientation 111	2	Typewriting 130	2
Orientation	1	Technical Communications 200	3
	17		18

SECOND YEAR

First Semester	Hours	Second Semester	Hours
General Physics 111	4	General Physics 122	4
Electronics 211	4	Electronic Switching and Control 237	3
Shop Orientation 122	2	Shop Technology 201	3
Fundamentals of Welding and Fabrication 100	2	Machinery Construction and Repair 202	4
Human Relations in Business and Industry 200	3	Model Construction 225	2
Fundamentals of Speaking 180	3		
	18		16

Opportunities for employment: Large industries where prototypes are developed. The developmental technician is part of the engineering team building prototype (first of its kind) equipment and products.

MAINTENANCE TECHNICIAN

Two-Year Program

FIRST YEAR

First Semester	Hours	Second Semester	Hours
Algebra and Trigonometry 140	4	Blueprint Reading 101	3
General Physics 111	4	General Physics 122	4
Electrical Fundamentals 111	3	Mechanisms 107	3
Electrical Applications 110	1	Electrical Fundamentals 122	3
English Fundamentals 91 or English Composition 111	3	Electrical Applications 120	1
Orientation	1	Shop Orientation 111	2
		Typewriting 130	2
	16		18

SECOND YEAR

First Semester	Hours	Second Semester	Hours
Electronics 211	4	Technical Drawing 100	3
Blueprint Reading 102	3	Electronics Switching and Control 237	3
Shop Orientation 122	2	Machinery Construction and Repair 202	4
Fundamentals of Welding and Fabrication 100	2	Introduction to Political Science 100	3
Shop Technology 201	3	Technical Communications 200	3
Fundamentals of Speaking 180	3		
	17		16

Employment opportunities: Industrial plants which use large amounts of machinery and equipment. When breakdowns occur, the trouble must be determined and necessary adjustments and repairs must be made. The maintenance technician is required to adjust, trouble shoot, and repair semi-automatic and automated production equipment and to supervise those who operate such equipment.

METALLURGICAL TECHNICIAN ADVISORY COMMITTEE

Eugene Carpentier
President
Universal Die Casting Div.
Hoover Ball & Bearing
Saline

Robert Dunn
Senior Research Assistant
Climax Molybdenum Co. of Michigan
Ann Arbor

John Maier
Supervisor, Metallurgical Dept.
General Motors Corp., Hydra-matic Div.
Ypsilanti

William Mertens
Supervisor, Metallurgical Dept.
General Motors Corp., Hydra-matic Div.
Ypsilanti

Nick Prittiman
General Manager, Chemical & Metallurgical Dept.
Ford Motor Company, General Parts Div.
Ypsilanti

William Raymont
Supervisor, Metallurgical Dept.
Ford Motor Company, General Parts Div.
Ypsilanti

Irvin Slane
Engineering Dept.
Rockwell-Standard Corp.
Chelsea

Faculty Coordinator: Robert C. Mealing

METALLURGICAL TECHNICIAN

Two-Year Program

FIRST YEAR

First Semester	Hours	Second Semester	Hours
English Fundamentals 91 or English Composition 111	3	General Chemistry 122	4
General Chemistry 111	4	Blueprint Reading 110	3
Industrial Materials 111	3	Basic Statistics 127	4
Algebra and Trigonometry 140	4	Metal Processing 121	3
Shop Orientation 111	2	Basic Metallurgy 122	2
Orientation	1	Shop Orientation 122	2
	17		18

SECOND YEAR

First Semester	Hours	Second Semester	Hours
Human Relations in Business and Industry 200	3	Introduction to Political Science 100	3
General Metallography 211	3	Advanced Metallography 222	3
Mechanical Testing 212	2	Quantitative Analysis 221	2
Blueprint Reading 120	3	Technical Communications 200	3
Mechanisms 127	3	Spectroscopy 223	3
General Physics 111	4	Structural Design 210	2
	18		16

Employment opportunities: A technician who assists engineers, chemists, and physicists to study, categorize, analyze, or apply various metallic or metal related materials. Opportunity also exists in metal processing industries in the field of quality controls.

WELDING AND FABRICATION ADVISORY COMMITTEE

Edward Brown
Brown's Welding
Chelsea

William G. Fredrick
Head, Product Engineering
Lear Siegler Inc.
Ann Arbor

Semyon Portnow
Product Sales Manager
Lear Siegler Inc.
Ann Arbor

Walter Samonek
Plumbers and Steam Fitters Apprentice Trades Union
Brooklyn

Burley Trew
Quality Welding Co.
Brighton

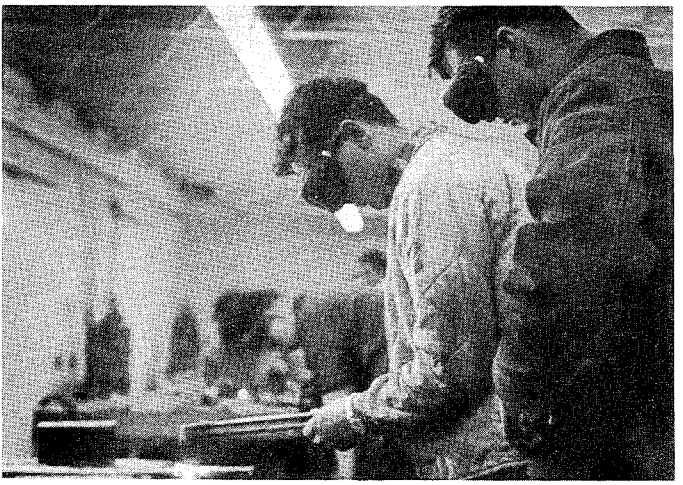
Faculty Coordinator: Daniel Gray

COMBINATION WELDER MECHANIC

One-Year Program

First Semester	Hours	Second Semester	Hours
Welding and Fabrication 111	6	Welding and Fabrication 122	6
Mathematics (elective)	3	Speech (elective)	3
Shop Orientation 111	2	Shop Orientation 122	2
Blueprint Reading 101	3	Blueprint Reading 102	3
English (elective)	3	Mathematics (elective)	3
Orientation	1		
	18		17

Employment opportunities: Mechanic in any facility requiring experienced or specialized welding repair or fabrication. Mechanic and maintenance person for oil companies to repair and fabricate pieces for petroleum transportation.



WELDING AND METAL FABRICATING TECHNICIAN

Two-Year Program

FIRST YEAR

First Semester	Hours	Second Semester	Hours
Welding and Fabrication 111	6	Welding and Fabrication 122	6
Mathematics (course numbered 40 or above)	3	English Fundamentals 91 or English Composition 111	3
Shop Orientation 111	2	Shop Orientation 122	2
Blueprint Reading 101	3	Blueprint Reading 102	3
Fundamentals of Speaking 180	3	Algebra and Trigonometry 140	4
Orientation	1		
	18		18

SECOND YEAR

First Semester	Hours	Second Semester	Hours
Welding and Fabrication 213	3	Power Sources 100	4
Technical Drawing 100 or Drafting 111	3	Welding and Fabrication 224	3
Introduction to Political Science 100	3	Human Relations in Business and Industry 200	3
Introductory Chemistry 57-58	4	Mechanical Testing 215	2
Industrial Materials 111	3	Structure in Architecture 210	2
	16	Technical Communications 200	3
			17

Employment opportunities: Technician in a fabrication shop or experimental laboratory. Manager or technician in an automotive maintenance center of a business or industry where extensive repair and rebuilding is done.

AUTOMOTIVE TECHNOLOGY ADVISORY COMMITTEE

Jay A. Bolt
Professor of Mechanical Engineering
The University of Michigan
Ann Arbor

John Bruckner
Bruckner Oldsmobile
Milan

David Deborde
Plant and Equipment Maintenance Supervisor
United Air Lines
Metropolitan Airport

John R. Henderson
Henderson Ford Sales Inc.
Ann Arbor

Roderick D. Janich
Naylor Motor Sales Inc.
Ann Arbor

George Palmer
Vice President
Palmer Motor Sales Inc.
Chelsea

D. James Sanderson
Service Manager
Howard Cooper Volkswagen Inc.
Ann Arbor

Myron Serbay
Serbay Motor Sales Inc.
Ypsilanti

John Steeb
Steeb Dodge Sales Inc.
Saline

Richard W. Whittaker
Service Manager
Superior Equipment Co.
Ypsilanti

Faculty Coordinators: Kenneth E. Barron
Bruce H. Welch

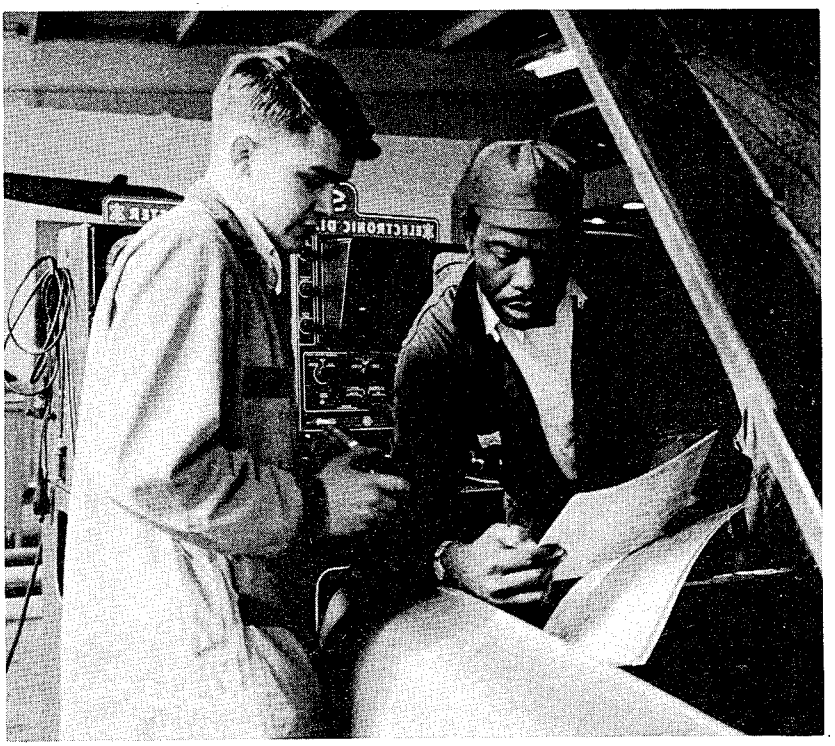
AUTOMOTIVE MECHANIC

One-Year Program

First Semester	Hours	Second Semester	Hours
Automotive—Basic Service 111	6	Automotive—Service 122 or Automotive Service Station Mechanic 150	6
Power Sources 100	4	Fundamentals of Welding and Fabrication 100	2
English (elective)	3	Speech (elective)	3
Mathematics (elective)	3	Business (elective)*	3
Orientation	1		
	17		14

*Human Relations in Business and Industry 200 or Principles of Salesmanship 160

Opportunities for employment: As a mechanic in a dealership, independent garage, service station, or maintenance department of a large business or industry.



AUTOMOTIVE MAINTENANCE TECHNICIAN

Two-Year Program

FIRST YEAR

First Semester	Hours
Fundamentals of Welding and Fabrication 100	2
Automotive—Basic Service 111	6
Power Sources 100	4
English Fundamentals 91 or English Composition 111	3
Mathematics (course numbered 40 or above)	3
Orientation	1
	19

Second Semester	Hours
Automotive—Service 122	6
Fundamentals of Speaking 180	3
Collision Estimating 200	3
Psychology (elective)	3
	15

SECOND YEAR

First Semester	Hours
Automotive—Diagnosis and Service 213	6
Principles of Accounting 111	3
Introduction to Political Science 100	3
Typewriting 130	2
Principles of Management 208	3
	17

Second Semester	Hours
Automotive—Diagnosis and Repair 224	6
Human Relations in Business and Industry 200	3
Principles of Salesmanship 160	3
Personnel Management 240	3
	15

Employment opportunities: As a mechanic in a dealership, service manager trainee, or as a technician in a large industry.

ELECTRICAL AND ELECTRONICS ADVISORY COMMITTEE

Dr. V. A. Basman
President
Microtron Corp.
Ann Arbor

Thomas Cell
Manager, Quality Assurance
Applied Dynamics Inc.
Ann Arbor

Louis J. Cutrona
Vice President, Research
Conductron Corp.
Ann Arbor

Daniel Gray
Plant Engineering Dept.
Saline Plant, General Parts Div.
Ford Motor Company
Saline

David Klinger
Project Manager
Ann Arbor Computer Corp.
Ann Arbor

Doug Lin
Electrical Engineer
Lear Siegler Inc.
Ann Arbor

Edwin E. Metevia
Manager, Systems Test Dept.
Bendix Systems Div.
Ann Arbor

Howard W. Town
Vice President, Director of Engineering
National Educational Television Inc.
Ann Arbor

Faculty Coordinators: Dean A. Russell
Kenneth L. Wheeler

ELECTRICAL MECHANIC

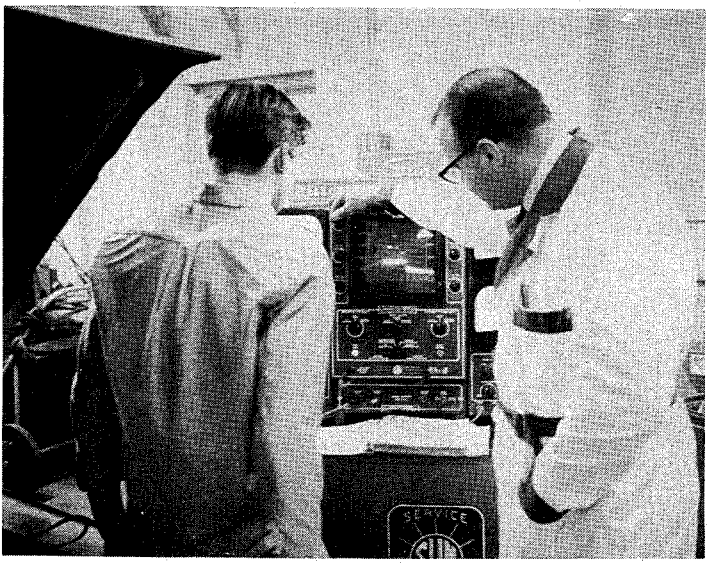
One-Year Program

First Semester	Hours	Second Semester	Hours
Developmental Mathematics 31 or Introductory Algebra 40	3-4	Mechanics 107	3
Technical Drawing 100	3	Physical Science 142	4
Fundamentals of Speaking 180 *	3	Electrical Fundamentals 111	3
English (elective)	3	Appliance Service and Repair 97**	5
Introductory Electricity 90	4	Mathematics (elective)	3
Orientation	1		
	17-18		18

*Appropriate developmental communication arts courses may be substituted by counselor.

**May include work experience.

Employment opportunities: Servicing household appliances and automobile electrical systems or pre-apprentice training for the electrical trades.



ELECTRONICS ENGINEERING TECHNICIAN

Two-Year Program

FIRST YEAR

First Semester	Hours	Second Semester	Hours
Technical Drawing 100	3	General Physics 111	4
Electrical Fundamentals 111	3	Industrial Electricity 127	4
Electrical Applications 110	1	Mechanisms 127	3
Algebra and Trigonometry 140	4	Fundamentals of Speaking 180	3
English Fundamentals 91 or English Composition 111	3	Electrical Fundamentals 122	3
Orientation	1	Electrical Applications 120	1
	15		18

SECOND YEAR

First Semester	Hours	Second Semester	Hours
Electronic Switching and Control 237	3	Shop Technology 201	3
Blueprint Reading 101	3	Circuit Testing, Repairs, and Debugging 239*	5
Introduction to Political Science 100	3	Electronics 222	4
Electronics 211	4	Industrial Electronics 238	4
Audio and Intermediate Frequency Transmission 200	3		
	16		16

*May include work experience.

Opportunities for employment: Technician in an engineering laboratory, computer, research, aircraft or missile industry; radio and television serviceman; will have the technical background necessary to meet the Federal Communication Commission element requirements.

FLUID POWER TECHNICIAN ADVISORY COMMITTEE

Robert Guy
Supervisor, Hydraulic Preventive Maintenance
General Motors Corp., Hydra-matic Div.
Ypsilanti

W. E. Hennells, Jr.
General Manager
W. E. Hennell Company
Belleville

Erwin Krueger
Krueger Hydraulic & Manufacturing Company
Ypsilanti

Clifford H. Wilford
Supervisor, Hydraulic Pneumatics
General Motors Corp., Hydra-matic Div.
Ypsilanti

Edward A. Wright
Manager
Krueger Hydraulic & Manufacturing Company
Ypsilanti

Faculty Coordinator: Robert C. Mealing

FLUID POWER TECHNICIAN

Two-Year Program

FIRST YEAR

First Semester	Hours	Second Semester	Hours
Blueprint Reading 101	3	Technical Drawing 100	3
Algebra and Trigonometry 140	4	Fundamentals of Speaking 180	3
Introductory Chemistry 57-58	4	Electrical Fundamentals 111	3
Shop Orientation 111	2	General Physics 111	4
Hydraulic Fundamentals 111	4	Hydraulic Generators 122	4
Orientation	1		
	18		17

SECOND YEAR

First Semester	Hours	Second Semester	Hours
Hydraulic Controls 213	3	Introduction to Numerical Control 100	2
Basic Hydraulic Circuits 214	3	Hydraulic Circuits 225	3
English Fundamentals 91 or English Composition 111 or Technical Communications 200	3	Pneumatics 226	3
Shop Technology 201	3	Electronic Switching and Control 237	3
Industrial Electricity 127	4	Introduction to Political Science 100	3
		Mechanisms 107	3
	16		17

Employment opportunities: Technician to assist engineers to design, fabricate, and install equipment requiring fluid power as a source of power or to activate accessories.

TEST TECHNICIAN

Two-Year Program

FIRST YEAR

First Semester	Hours
English Fundamentals 91 or English Composition 111	3
Algebra and Trigonometry 140	4
Electrical Fundamentals 111	3
Electrical Applications 110	1
Blueprint Reading 101	3
Orientation	1
	15

Second Semester	Hours
Technical Communications 200	3
Mechanisms 107	3
Electrical Fundamentals 122	3
Electrical Applications 120	1
Blueprint Reading 102	3
Typewriting 130	2
Introduction to Political Science 100	3
	18

SECOND YEAR

First Semester	Hours
General Physics 111	4
Shop Orientation 111	2
Electronics 211	4
Fundamentals of Welding and Fabrication 100	2
Fundamentals of Speaking 180	3
Industrial Materials 111	3
	18

Second Semester	Hours
General Physics 122	4
Electronics Switching and Control 237	3
Basic Statistics 128	4
Human Relations in Business and Industry 200	3
Mechanical Testing 215	2
Field Test Instruments 200	2
	18

Employment opportunities: In industrial plants which require testing in the operation of the plant and testing and checking as workmen build or manufacture new products. The test technician works in the area of product performance and improvement, automotive safety, and engine performance.

TRADE RELATED INSTRUCTION

Code 501

DIECAST DIEMAKING APPRENTICE PROGRAM

Suggested Schedule

		Hours	Credit Hours
MATHEMATICS			
1.1	Fractions	18	1
2.1	Algebra	18	1
3.1	Geometry	18	1
4.1	Trigonometry 1	18	1
5.1	Logarithms	18	1
6	Trigonometry 2	18	1
7	Trigonometry 3	18	1
8	Compound Angles 1	18	1
9	Compound Angles 2	18	1
10	Gearing 1	18	1
11	Gearing 2	18	1
DRAFTING			
101	Blueprint Fundamentals	18	1
102	Elementary Projection	18	1
103	Symbols and Sectioning	18	1
104	Visualization by Using Clay Models	18	1
105	Advanced Projection	18	1
106	Machine Shop Blueprint Reading 1	18	1
107	Elementary Pictorial Drawing	18	1
108.4	Detail and Assembly Drawing (Die)	18	1
109.4	Advanced Die Shop Blueprint Reading	18	1
110.4	Elements of Die Design 1	18	1
111.4	Elements of Die Design 2	18	1
151.1	Machine Design — Descriptive Geometry	18	1
151.2	Machine Design — Descriptive Geometry	18	1
151.3	Machine Design — Descriptive Geometry	18	1
SHOP THEORY			
301	Metal Working Trades 1	18	1
302	Metal Working Trades 2	18	1
326	Metal Working Trades 3	18	1
327	Metal Working Trades 4	18	1
327.4	Die Theory for Diecast Diemaking	18	1
CHARACTERISTICS OF METALS			
501	Metals 1	18	1
502	Metals 2	18	1
503	Heat Treatment 1	18	1
504	Heat Treatment 2	18	1
PHYSICS			
541	Physics 1	36	2
RELATED PLANT TRAINING		24	
	TOTAL	672	36

Code 502

DIEMAKING APPRENTICE PROGRAM

Suggested Schedule

		Hours	Credit Hours
MATHEMATICS			
1.1	Fractions	18	1
2.1	Algebra	18	1
3.1	Geometry	18	1
4.1	Trigonmetry 1	18	1
5.1	Logarithms	18	1
6	Trigonometry 2	18	1
7	Trigonometry 3	18	1
8	Compound Angles 1	18	1
9	Compound Angles 2	18	1
10	Gearing 1	18	1
11	Gearing 2	18	1
DRAFTING			
101	Blueprint Fundamentals	18	1
102	Elementary Projection	18	1
103	Symbols and Sectioning	18	1
104	Visualization by Using Clay Models	18	1
105	Advanced Projection	18	1
106	Machine Shop Blueprint Reading	18	1
107	Elementary Pictorial Drawing	18	1
108.4	Detail and Assembly Drawing (Die)	18	1
109.4	Advanced Die Shop Blueprint Reading	18	1
110.4	Elements of Die Design 1	18	1
111.4	Elements of Die Design 2	18	1
151.1	Machine Design — Descriptive Geometry	18	1
151.2	Machine Design — Descriptive Geometry	18	1
151.3	Machine Design — Descriptive Geometry	18	1
SHOP THEORY			
301	Metal Working Trades 1	18	1
302	Metal Working Trades 2	18	1
326	Metal Working Trades 3	18	1
327	Metal Working Trades 4	18	1
327.4	Die Theory	18	1
CHARACTERISTICS OF METALS			
501	Metals 1	18	1
502	Metals 2	18	1
503	Heat Treatment 1	18	1
504	Heat Treatment 2	18	1
PHYSICS			
541	Physics 1	36	2
RELATED PLANT TRAINING		24	
	TOTAL	672	36

Code 503

INDUSTRIAL ELECTRICAL APPRENTICE PROGRAM

Suggested Schedule

		Hours	Credit Hours
MATHEMATICS			
001.1	Fractions	18	1
002.1	Algebra	18	1
022	Geometry and Trigonometry for Electrical and Allied Trades	18	1
023	Vectors	18	1
005.2	Math	18	1
ELECTRICITY			
201	DC Fundamentals	36	2
202	Wiring Magnetism and Armature Winding	36	2
203	DC Machines	18	1
204	DC Controllers	36	2
205	AC Fundamentals	36	2
206	Transformers and Alternators	18	1
207	AC Motors and Stator Windings	36	2
208	AC Controllers	36	2
209	Instrument and Illumination	36	2
210	National Electric Code (J. I. C.)	36	2
211	Electronics	36	2
212	Welding Controls	36	2
213	Electrical Circuits	18	1
214	Controller Application	36	2
246	Electrical Tools and Equipment	18	1
HYDRAULICS			
401	Hydraulic Fundamentals	18	1
409	Basic Hydraulic Circuits	18	1
PHYSICS			
541	Physics 1	36	2
CHARACTERISTICS OF METALS			
502	Metals 2	18	1
RELATED PLANT TRAINING		24	
	TOTAL	672	36

Code 504

MACHINE REPAIR APPRENTICE PROGRAM

Suggested Schedule		Hours	Credit Hours
MATHEMATICS			
1.1	Fractions	18	1
2.1	Algebra	18	1
3.1	Geometry	18	1
4.1	Trigonometry 1	18	1
5.1	Logarithms	18	1
6	Trigonometry 2	18	1
7	Trigonometry 3	18	1
8	Compound Angles 1	18	1
9	Compound Angles 2	18	1
10	Gearing 1	18	1
11	Gearing 2	18	1
DRAFTING			
101	Blueprint Fundamentals	18	1
102	Elementary Projection	18	1
103	Symbols and Sectioning	18	1
104	Visualization by Using Clay Models	18	1
105	Advanced Projection	18	1
106	Machine Shop Blueprint Reading	18	1
107	Elementary Pictorial Drawing	18	1
SHOP THEORY			
301	Metal Working Trades 1	18	1
302	Metal Working Trades 2	18	1
326	Metal Working Trades 3	18	1
327	Metal Working Trades 4	18	1
ELECTRICITY			
201.4	DC Fundamentals	18	1
205.4	AC Fundamentals	18	1
HYDRAULICS			
401	Fundamentals	18	1
402	Hydraulics	18	1
405	Hydraulics	18	1
406	Hydraulics	18	1
407	Hydraulics	18	1
409	Basic Hydraulic Circuits	18	1
WELDING			
262	Acetylene Welding	18	1
264	Arc Welding	18	1
CHARACTERISTICS OF METALS			
501	Metals 1	18	1
502	Metals 2	18	1
503	Heat Treatment 1	18	1
PHYSICS			
541	Physics 1	36	2
RELATED PLANT TRAINING		6	
	TOTAL	672	37

Code 505

MECHANICAL DESIGN APPRENTICESHIP

Suggested Schedule

		Hours	Credit Hours
MATHEMATICS			
004.1	Trigonometry 1	18	1
005.2	Logarithms	18	1
006	Trigonometry 2	18	1
007	Trigonometry 3	18	1
008	Compound Angles 1	18	1
009	Compound Angles 2	18	1
010	Gearing 1	18	1
011	Gearing 2	18	1
033	Preparatory Algebra 1	36	2
041.1	Elements of Strength of Materials 1	18	1
041.2	Elements of Strength of Materials 2	18	1
051.1	Engineering Algebra	18	1
051.2	Engineering Algebra 2	18	1
051.3	Engineering Algebra 3	18	1
051.4	Engineering Algebra 4	18	1
DRAFTING			
107	Elementary Pictorial Drawing	18	1
108	Detail and Assembly Drawing	18	1
108.4	Detail and Assembly Drawing (Die)	18	1
110	Tool Details — Drawing Conventions	18	1
111	Fixture and Tool Design	18	1
111.4	Elements of Die Design 2	18	1
111.6	Gage Design	18	1
122	Sheet Metal Drawing 1	18	1
123	Sheet Metal Drawing 2	18	1
124	Sheet Metal Drawing 3	18	1
125	Sheet Metal Drawing 4	18	1
126	Sheet Metal Drawing 5	18	1
127	Sheet Metal Drawing 6	18	1
128	Sheet Metal Drawing 7	18	1
129	Sheet Metal Drawing 8	18	1
151.1	Machine Design — Descriptive Geometry	18	1
151.2	Machine Design — Descriptive Geometry	18	1
151.3	Machine Design — Descriptive Geometry	18	1
151.4	Machine Design — Descriptive Geometry	18	1
PHYSICS			
541	Elementary Physics 1	36	2
JOB PROCESSES AND PLANT LAYOUT			
721	Job Processes and Plant Layout	18	1
	TOTAL	720	37

Code 506
MILLWRIGHT APPRENTICE PROGRAM

Suggested Schedule		Hours	Credit Hours
MATHEMATICS			
1.1	Shop Arithmetic	18	1
2.1	Algebra	18	1
3.1	Geometry	18	1
4.1	Trigonometry 1	18	1
41.1	Elementary Strength of Materials 1	18	1
41.2	Elementary Strength of Materials 2	18	1
DRAFTING			
101	Blueprint Fundamentals	18	1
102	Elementary Projection	18	1
103	Symbols and Sectioning	18	1
104	Visualization by Using Clay Models	18	1
105	Advanced Projection	18	1
105.6	Drafting	18	1
106	Machine Shop Blueprint Reading 1	18	1
106.6	Blueprints	18	1
107	Elementary Pictorial Drawing	18	1
108	Detail and Assembly Drawing (Tool)	18	1
SHOP THEORY			
301	Metal Working Trades 1	18	1
301.6	Millwright Theory and Equipment 1	18	1
302.6	Millwright Theory and Equipment 2	18	1
METALLURGY			
501	Characteristics of Metals 1	18	1
502	Characteristics of Metals 2	18	1
503	Heat Treatment 1	18	1
504	Heat Treatment 2	18	1
PHYSICS			
541	Elementary Physics 1	18	1
542	Elementary Physics 2	18	1
HYDRAULICS			
401	Fundamentals	18	1
409	Basic Hydraulic Circuits	18	1
ELECTRICITY			
201.4	DC Fundamentals	18	1
205.4	AC Fundamentals	18	1
213	Electrical Circuits	18	1
WELDING			
262	Acetylene Welding 1	18	1
264	Arc Welding 1	18	1
JOB PROCESSES AND PLANT LAYOUT			
721	Job Processes and Plant Layout	18	1
PLUMBING AND PIPEFITTING			
248	Fundamentals	18	1
SPEECH			
Speech (Elective)		18	1
RELATED PLANT TRAINING		24	
	TOTAL	672	36

Code 507

TOOLMAKING APPRENTICE PROGRAM

Suggested Schedule

		Hours	Credit Hours
MATHEMATICS			
1.1	Fractions	18	1
2.1	Algebra	18	1
3.1	Geometry	18	1
4.1	Trigonometry 1	18	1
5.1	Logarithms	18	1
6	Trigonometry 2	18	1
7	Trigonometry 3	18	1
8	Compound Angles 1	18	1
9	Compound Angles 2	18	1
10	Gearing 1	18	1
11	Gearing 2	18	1
DRAFTING			
101	Blueprint Fundamentals	18	1
102	Elementary Projection	18	1
103	Mechanical Standards	18	1
104	Blueprint Reading (Clay)	18	1
105	Advanced Projection	18	1
106	Machine Shop Blueprint Reading	18	1
107	Elementary Pictorial Drawing	18	1
108	Detail and Assembly Drawing (Tool)	18	1
109	Machine Shop Blueprint Reading 2	18	1
110	Tool Details — Drawing Conventions	18	1
111	Elements of Tool and Fixture Design	18	1
111.6	Gage Design	18	1
SHOP THEORY			
301	Metal Working Trades 1	18	1
302	Metal Working Trades 2	18	1
326	Metal Working Trades 3	18	1
327	Metal Working Trades 4	18	1
HYDRAULICS			
401	Fundamentals	18	1
409	Basic Hydraulic Circuits	18	1
CHARACTERISTICS OF METALS			
501	Metals 1	18	1
502	Metals 2	18	1
503	Heat Treatment 1	18	1
504	Heat Treatment 2	18	1
PHYSICS			
541	Elementary Physics 1	36	2
ELECTRICITY			
201.4	DC Fundamentals	18	1
205.4	AC Fundamentals	18	1
RELATED PLANT TRAINING		6	
	TOTAL	672	37

COURSE DESCRIPTIONS

DIVISION OF BUSINESS AND INDUSTRIAL MANAGEMENT

100 Work Experience ..... 1 - 6 credit hours

Washtenaw Community College provides students in both General and Occupational programs an opportunity to earn credits while engaged in supervised and usually subsidized work experience directly related to the educational or occupational objective of the student. Students who plan on enrolling for work experience credit must first review their plans with their academic adviser and the appropriate divisional director and then secure the director's permission. Work experience credits may be applied to the certificate of achievement or the associate degree. No more than twelve credit hours of supervised work experience may be applied to the associate degree requirements and no more than six for a certificate of achievement.

ACCOUNTING

30 Fundamentals of Accounting ..... 3 credit hours

A non-professional, beginning course in accounting which introduces the student to the theory and practice of double-entry bookkeeping. Emphasis is placed on the development of an understanding of basic financial records and forms and on ability to apply elementary accounting procedures to business and/or industrial situations. (3-0)

111 Principles of Accounting ..... 3 credit hours

Prerequisite or co-requisite: Introduction to Business 140 or divisional permission.

An introductory study of accounting principles to acquaint the student with the theory and logic that underlie accounting practices and procedures. Emphasis is placed upon the role of accounting in developing essential information about business and/or industrial organizations and their operations. Course coverage includes the accounting cycle, financial statements, controlling accounts, special columnar journals, and the voucher system. This is the first of two accounting courses required of all Business Administration transfer students. (3-0)

122 Principles of Accounting ..... 3 credit hours

Prerequisite: Principles of Accounting 111 or equivalent.

An introduction to the accounting function as it applies to the ownership, income and expense, and cost aspects of business and/or industrial enterprise. Accounting is perceived as an essential function in the achievement of enterprise goals. Special emphasis is placed upon interpretation of accounting data. Course materials relate to the business partnership, corporation, and industrial manufacturing. This is the second of two accounting courses required of all Business Administration transfer students. (3-0)

200 Intermediate Accounting ..... 3 credit hours

Prerequisite: Principles of Accounting 111 and Principles of Accounting 122 or equivalent.

A detailed study of specialized phases of accounting such as the treatment of cash and temporary investments, receivables, inventories, investments, plants and equipment, intangibles, deferred charges, liabilities, capital stock and surplus, and financial statements.

MANAGEMENT AND SECRETARIAL

111 Business Law ..... 3 credit hours

Text and case study of the general laws applicable to business covering the nature of law, courts and court procedures, crimes and taxes, contracts, agency, labor relations, and partnerships. (3-0)

122 Business Law ..... 3 credit hours

Prerequisite: Business Law 111.

This is a study of corporations, property, sales, negotiable instruments, insurance, and bankruptcy. (3-0)

130 Business Machines ..... 2 credit hours

Prerequisite: Business Mathematics 100 or equivalent or divisional permission.

Instruction in the basic mathematical processes — addition, subtraction, multiplication, division — on modern calculating machines of both listing and non-listing types. Instruction in operation and use of duplicating and transcribing machinery and equipment. Emphasis throughout the course is on machine applications to mathematical problem-solving in business and industry. (2-0)

111 Principles of Data Processing ..... 4 credit hours

(Consolidation of former courses 111 and 122)

Prerequisite: First year standing or divisional permission.

An introduction to the principles and concepts in the field of data processing and its application to the management decision-making process in business and industry. The course develops an understanding of problem definition and organization, and covers the role of data processing in business, as well as an acquaintance with elementary computer programming techniques. Included is a survey of unit record equipment and the study of various types of electro-mechanical and electronic data processing equipment and their utilization in making business decisions. Laboratory exercises are combined with classroom instruction to realistically relate the various units of data processing equipment to the electronic computer. Emphasis throughout the course is on the analysis of systems and procedures for processing business data. (3-2)

Note: This is not a course in detailed computer programming.

122 Data Processing Applications ..... 4 credit hours

Prerequisite: Principles of Data Processing 111 or equivalent.

Course designed to acquaint the student with data processing applications in business and/or industrial operations. Emphasis is given to the development of an understanding of machine-systems for processing data and the advantages inherent in mechanization. Includes a study of data processing applications in the areas of inventory control, payroll accounting, accounts receivable, and accounts payable. (3-2)

213 Data Processing Systems and Procedures ..... 4 credit hours

Prerequisite: Data Processing Applications 122 or equivalent.

An introduction to the principles and concepts of programming systems and procedures thereby enabling the student to develop the essential groundwork for more advanced study of programming systems. Major emphasis is on the purposes and functions of the various types of programming systems and procedures and their relevance to business-industrial enterprise. (3-2)

224 Computer Programming ..... 4 credit hours

Prerequisite: Data Processing Systems and Procedures 213 or equivalent or divisional permission.

An applied study of the functions and capabilities of specific data processing machinery and equipment, to acquaint the student with some of the tools and raw materials essential to programming. Included is a complete exposition of the COBOL (common business-oriented language) system, and an introduction to the FORTRAN (formula translation) language system of computer programming. Actual programming exercises are combined with the study of the factors involved in electronic data processing systems design relative to hardware, accounting control, systems controls, and purpose. Course coverage is designed to provide the student with sufficient knowledge of programming systems concepts to enable him to readily adapt to any specific system. (3-2)

200 Independent Directed Study ..... 2 credit hours

Prerequisite: Divisional permission.

A planned program of study in selected business-industrial subject matter under the guidance and direction of a regular staff member. Designed to supplement classroom study in a way that will enhance the student's total educational experience. Includes readings, analyses, conferences, reports. Variable credit. (2/6-0)

Note: Meeting time is on an "arranged" basis.

140 Introduction to Business ..... 3 credit hours

Prerequisite: First year standing or divisional permission.

An introductory study of the functions, objectives, problems, organization, and management of modern business and/or industrial enterprise. Designed to acquaint the student with the free-enterprise system of business-economic activity and the impact of the consumer and governmental forces upon the system. The student develops an insight into the vital role of the administrative (management) function in our economy as a whole and in the operation of a single business unit. The student is provided with a practical orientation, exploration, and background of information in business and industry. (3-0)

130 Shorthand ..... 3 credit hours

An integrative program of study in Gregg shorthand designed to meet the vocational standards of the modern business office. Emphasis is placed on shorthand principles and practices, development of transcription techniques and skills, and the ability to transcribe office-style dictation found in business and other specialized fields such as insurance, law, and medicine. Credit and contact hours are progressive and are contingent on student progress as determined by proficiency tests undertaken upon completion of predetermined phases (130A, B, C) of the course work. (3/9-0)

130 Typewriting ..... 2 credit hours

An integrative, programmed approach to the development of the student's operative skill in typewriting, either as a vocational tool or for personal use. Course coverage includes training in the mastery of the keyboard, development of proper techniques, building speed and accuracy, exposure to basic typing applications (business communications, tabulation problems, manuscripts, office forms, etc.). Credit and contact hours are progressive and are contingent on student progress as determined by proficiency tests undertaken upon completion of predetermined phases (130A, B, C) of the course work. (2/6-0)

150 Office Systems and Procedures ..... 3 credit hours

Prerequisite or co-requisite: High school typewriting proficiency or concurrent enrollment in typewriting or equivalent.

A practical study of the fundamental systems and procedures comprising the modern business-industrial and/or professional office. Emphasis is upon developing the student's insights into the responsibilities of the office staff, personal qualifications, human relations factors, and their essential relationship to the effective integration of all office systems and procedures. Includes the study of filing and records systems, telephone and telegraph communications, written reports, transcribing and duplicating machinery and equipment. Problem-oriented sessions and projects enable the student to develop a practical view of the office system and its vital role in the administration of the total business-industrial and/or professional organization. (3-0)

160 Principles of Salesmanship ..... 3 credit hours

Prerequisite: Introduction to Business 140 or divisional permission.

A study of the basic principles and concepts of the sales function in modern business-industrial enterprise in the marketing of goods and services. Included is an analysis of sales techniques, the sales "cycle," sales demonstrations, as well as personal career salesmanship. Emphasis is given to creativity in selling, and the impact of socio-economic and psychological factors related to consumer needs, motivations, and product performance as they affect the sale of consumer and/or industrial goods and services. (3-0)

200 Human Relations in Business and Industry ..... 3 credit hours

Prerequisite: Second year standing or divisional permission.

A practical study of the modern concepts of administrative principles and practices with special emphasis on the human relations aspects of management responsibility as it affects employee attitudes, morale, and productivity. Development of insights into relationships among people in business and industrial organizations, and the role of the administrator in achieving coordination and cooperation of individuals and groups in the pursuit of established organizational goals. Major emphasis is on relationships among individuals and/or small groups. Classroom instruction consists of lectures, recitation-discussion, and problem-oriented sessions to enable the student to realistically relate the course materials to the human relations aspect of modern business and/or industrial enterprise. (3-0)

208 Principles of Management ..... 3 credit hours

Prerequisite or co-requisite: Principles of Economics 211 and second year standing or equivalent or divisional permission.

A study of the basic principles of management at the administrative, staff, and operational (line) levels of modern business and/or industrial enterprise. The student develops an understanding of the universality of management functions and principles, and insights into the historical development of management concepts and their evolution into a modern management philosophy. Consideration is also given to the nature and structure of organizations and to recent developments in management decision-making and leadership styles in an organizational context. Classroom instruction consists of lectures, recitation-discussions, and problem-oriented sessions thus enabling the student to develop a practical philosophy of management and to acquire realistic insights into administrative principles and techniques as they relate to all fields of business and/or industrial activity. (3-0)

230 Office Management ..... 3 credit hours

The application of the principles of management to the planning, organization, and control of office work. The direction and control of services and performance, simplification of procedures and methods, and the establishment of standards and planning of physical facilities and business forms are also included. (3-0)

240 Personnel Management ..... 3 credit hours

Prerequisite: Introduction to Business 140 and Principles of Management 208 or divisional permission.

An exposition of the fields of activity covered in modern personnel work. Topics covered are employment techniques, wages and hours, job evaluation, training, employer ratings, collective bargaining, employment, counseling and collateral benefits such as pensions and fringe benefits. (3-0)

250 Principles of Marketing ..... 3 credit hours

Prerequisite or co-requisite: Principles of Economics 211 and second year standing or equivalent or divisional permission.

A study of the institutions and functions developed for carrying on trade operations, retail and wholesale agencies, elements of marketing efficiency, the cost of marketing, price maintenance, unfair competition, and the relationship of government to marketing. (3-0)

260 Sales Management ..... 3 credit hours

Prerequisite: Introduction to Business 140 and Principles of Salesmanship 160 or equivalent.

This course involves the planning, organization, and direction of sales effort; the management of sales and services. Personnel and control of sales operations are emphasized. (3-0)

270 Advertising Management ..... 3 credit hours

Prerequisite or co-requisite: Principles of Marketing 250 or equivalent or divisional permission.

A practical managerial approach to the study of the basic principles and concepts which underlie advertising practice and procedure in the marketing-promotional and distribution aspects of modern business-industrial enterprise operations. Course coverage includes the role of advertising in the individual firm (micro-analysis) and the total economy (macro-analysis); also advertising objectives, methods, techniques, preparation, research, surveys, copywriting, layout, media selection, and testing advertising effectiveness, as well as advertising rates and budgetary factors. (3-0)

DIVISION OF COMMUNICATION ARTS

ART

111 Basic Drawing ..... 3 credit hours

This is an initial course in drawing in several media using a variety of techniques. Essentials of visual form, analysis of structure and texture are studied. (0-6)

122 Basic Drawing ..... 3 credit hours

A continuation of Basic Drawing 111, this course gives the student further practice in the techniques studied in the first semester, and introduces several new media. (0-6)

112 Basic Design ..... 3 credit hours

Two-dimensional problems in design. Experimentation with basic elements of design, such as line, form, texture, and color, using a wide variety of media. (0-6)

123 Basic Design ..... 3 credit hours

Experimentation with three-dimensional design. Structural composition. Use of materials and tools of sculpture and ceramics. (0-6)

113 Water Color ..... 3 credit hours

Fundamental techniques in handling waterpainting media. Analysis of subject matter using still-life and landscape. (0-6)

124 Water Color ..... 3 credit hours

A continuation of Water Color 113 with emphasis on composition, pictorial concepts, and development of personal expression. (0-6)

114 Oil Painting ..... 3 credit hours

Development of painting skills in oil, exploring a wide range of expression based on still-life, landscape, and the human figure. (0-6)

125 Oil Painting ..... 3 credit hours

A continuation of Oil Painting 114, with emphasis on developing an individual painting style. (0-6)

130 Art Appreciation ..... 3 credit hours

Significant works of art in varied forms which exemplify major cultural patterns from the time of the Greeks to the present will be studied. The student will be encouraged to evolve his own criteria for evaluating art. (3-0)

ENGLISH

30 Developmental English ..... 3 credit hours

This course is designed for any student who needs to improve his basic writing skills due to deficiencies in grammar, vocabulary, spelling, and punctuation. Primary emphasis will be placed on writing intelligible sentences and paragraphs. Once the student has mastered basic writing skills, he will write brief papers appropriate to his area of specialization. Students will be given individual instruction. (3-0)

40 Developmental Reading ..... 3 credit hours

This course is designed for any student deficient in reading skills. Individualized instruction is given on the basis of diagnostic testing. Emphasis is placed on reading comprehension and vocabulary development. (3-0)

50 Reading Improvement ..... 3 credit hours

Prerequisite: Permission of instructor.

This course is meant for the competent student interested in improving his reading speed and comprehension. Reading techniques appropriate to academic materials are stressed, as are the acquiring of good study skills, the taking of notes, and the writing of examinations. (3-0)

91 English Fundamentals ..... 3 credit hours

English Fundamentals 91 and 92 constitute a sequence which stresses the practical applications of the English language in everyday life. The sequence is primarily designed for those students enrolled in non-transfer programs. English Fundamentals 91 emphasizes both oral and written composition in the preparation of short essays, interviews, a brief documented report, letters of application, and questionnaire forms. (3-0)

92 English Fundamentals ..... 3 credit hours

Prerequisite: English Fundamentals 91.

This course focuses on short papers and written and oral reports, as well as an enrichment program in the kinds of communication that will meet the student's probable future needs. (3-0)

100 Business Communication ..... 3 credit hours

Prerequisite: Proficiency in typewriting or concurrent enrollment in typewriting; also English Fundamentals 91 and 92, or English Composition 111 and 122.

A course to develop the student's oral and written communication skills as they relate to business and/or industrial enterprise. Emphasis is placed upon the social and psychological aspects and the public relations function of business communication, along with its prime purpose of transmission of information and persuasion. The student develops an awareness of the importance of clarity, conciseness, accuracy, and appropriateness of tone in all types of business communication — oral and written. Includes business correspondence and business reports, and the gathering, preparation, organization, and presentation of data. (3-0)

111 English Composition ..... 3 credit hours

English Composition 111 and 122 constitute a sequence designed for students who intend to transfer to senior colleges and universities. The student will write both in-class and outside themes frequently. Reading materials will serve as the basis for these themes and for classroom discussions. (3-0)

122 English Composition ..... 3 credit hours

Prerequisite: English Composition 111.

A continuation of English Composition 111, during which a full-length research paper will be written. (3-0)

160 Introduction to Literature:
Poetry and Drama ..... 3 credit hours

Prerequisite: English Fundamentals 91 or English Composition 111.

An introduction to the study of poetic and dramatic literature, this course is designed to give an understanding of literature through close reading and discussion of selected works of poetry and drama. (3-0)

170 Introduction to Literature:
Short Story and Novel ..... 3 credit hours

Prerequisite: English Fundamentals 91 or English Composition 111.

A companion course to Introduction to Literature: Poetry and Drama 160. In both, encouragement will be given to the student to evolve his own criteria for assessing the value of a literary work. (3-0)

200 Technical Communications ..... 3 credit hours

This course provides the student with the skills to communicate by means of writing, speaking and demonstration, and is designed primarily for those studying to be technicians in industry, the health occupations, and business.

In addition to improving writing and speaking skills of a technical nature, the student will learn the methods of reporting factual information through the analysis of problems and events related to his technical specialty. The uses of audio-visual equipment, the creating of graphic presentations, and the development of an appreciation of precise reporting through the use of elementary statistics are all parts of this course. (3-0)

211 American Literature ..... 3 credit hours

Prerequisite: English Fundamentals 91 or English Composition 111.

A study of our nation's literature from the beginnings to the Civil War, stressing the major authors of the period. (3-0)

222 American Literature ..... 3 credit hours

Prerequisite: English Fundamentals 91 or English Composition 111.

A continuation of American Literature 211, covering the period from the Civil War to the present. (3-0)

213 World Literature ..... 3 credit hours

Prerequisite: English Fundamentals 91 or English Composition 111.

World Literature 213-224 is a sequence which attempts an approach to the eternal values of man through literary masterpieces written from the time of ancient Greece to the present. (3-0)

224 World Literature ..... 3 credit hours

Prerequisite: English Fundamentals 91 or English Composition 111.

A continuation of World Literature 213, the second part of this sequence offers a detailed study of some of the great literary experience since the Renaissance and attempts to show how they have contributed to our present cultural heritage. (3-0)

270 Creative Writing ..... 3 credit hours

Prerequisite: English Fundamentals 91, or English Composition 111, or permission of instructor.

A course in the fundamentals of creative writing through the analysis of various forms of writing and frequent written exercises in fiction, poetry, and basic playwriting. While the student is encouraged to develop writing skills according to his own interests and abilities, the course is based on the assumption that an understanding of the skills involved in creative writing will also make the student a better reader of the masterpieces of poetry, fiction, and drama. This course is also designed for adults who are seeking an avocation in creative writing, and are interested in learning the fundamentals of the craft. (3-0)

JOURNALISM

100 Journalism Practicum ..... 1 credit hour

Students interested in working on the staff of the college publications do so under the direction of the publications advisor. This course may be repeated for credit up to a maximum of four times. (0-2)

111 Introduction to Journalism and Elementary Reporting ..... 3 credit hours

This first-semester course includes an introduction to mass communications and elementary reporting techniques. Members of the class serve on the college newspaper staff. (3-0)

122 Advanced Reporting and Editing ..... 3 credit hours

This second-semester course includes a study of advanced depth reporting and newspaper editing techniques. Members of the class serve or the staff of the college newspaper, which they assist in editing. (3-0)

FOREIGN LANGUAGES

111 First Year French ..... 4 credit hours

This course is designed for those who are beginning, or who wish to review their foreign language study. Emphasis is on the oral-aural approach. (3-2)

122 First Year French ..... 4 credit hours

Prerequisite: French 111.

A continuation of French 111. Class conversation, elementary readings, and language laboratory practice, stress the spoken language and help develop a basis for further study. (3-2)

111 First Year Spanish ..... 4 credit hours

This is a beginning course in Spanish and stresses the spoken language through practice in the language laboratory. (3-2)

122 First Year Spanish ..... 4 credit hours

Prerequisite: Spanish 111.

The work begun in Spanish 111 is continued, with additional stress on readings and class conversations. (3-2)

111 First Year Russian ..... 4 credit hours

This course is designed for those who have had little or no experience with Russian. Practice in listening and speaking in the classroom and the language laboratory. (3-2)

122 First Year Russian ..... 4 credit hours

Prerequisite: Russian 111.

A continuation of Russian 111, with continued emphasis on the oral-aural approach. (3-2)

213 Second Year French ..... 4 credit hours

Prerequisite: French 122 or permission of instructor.

Advanced conversations and readings emphasize several cultural aspects of the language and continue the work done in French 111-122. Students with good high-school backgrounds in French may be eligible for admission to this course without having taken French 111-122. (3-2)

224 Second Year French ..... 4 credit hours

Prerequisite: French 213 or permission of instructor.

This is a continuation of French 213. Short wave broadcasts and language laboratory practice augment the oral-aural method. (3-2)

213 Second Year Spanish ..... 4 credit hours

Prerequisite: Spanish 122 or permission of instructor.

This course is designed for those who have good backgrounds in Spanish, and who wish to continue their study of the language. (3-2)

224 Second Year Spanish ..... 4 credit hours

Prerequisite: Spanish 213 or permission of instructor.

A continuation of Spanish 213, with advanced readings and conversations, and more attention to Spanish culture. (3-2)

MUSIC

130 Band ..... 1 credit hour

This course in performance is open to all students and the public upon registration for the course. It may be repeated for credit up to a maximum of four times. (0-2)

140 Chorus ..... 1 credit hour

This course in performance is open to all students and the public upon registration for the course. It may be repeated for credit up to a maximum of four times. (0-2)

150 Basic Musicianship ..... 2 credit hours

This course is designed to give the prospective school teacher singing, music reading, and theory experience in the elements of music. It acquaints the student with concepts of rhythm and tonality, with the aim of developing musical skills and understanding. (2-0)

160 Music Appreciation ..... 3 credit hours

This course is designed to acquaint the student with the major works of music through recordings. Presentations will deal with rudiments of music, their function in a variety of works, different styles, and the growth and development of musical forms. (3-0)

SPEECH

30 Developmental Speech ..... 2 credit hours

Improvement of vocabulary, spoken grammar, pronunciation, and articulation. Critical treatment of individual speaking problems. Pre-recorded practice tapes for student use with a tape recorder. The language laboratory will be used when needed. If a student elects Developmental English 30 or Developmental Reading 40, and intends to take Fundamentals of Speaking 180, he must take Developmental Speech 30 as a prerequisite. (0-4)

180 Fundamentals of Speaking ..... 3 credit hours

Instruction in essential speech processes and skills is offered. Organization of speeches and effective delivery will be studied through the use of practical problems. If a student is taking Developmental English 30 or Developmental Reading 40, he must elect Developmental Speech 30 before electing Fundamentals of Speaking 180. (3-0)

187 Modern Communication Skills ..... 3 credit hours

Prerequisite: Fundamentals of Speech 180.

Extensive practice in reading aloud for contemporary communication situations, including preparation and presentation of copy for radio and TV; and the presentation of reports, technical and general, using a public address system. The course includes techniques for reading literature aloud for children and adults. Extensive individual practice with a tape recorder. (3-0)

191 Basic Acting and Directing ..... 3 credit hours

Acting as a speech experience, developing confidence, emotional perception and an objective appraisal by the average student of his own special speech talents. Through the performance of dramatic roles, the second-semester speech student achieves a greater freedom of movement and vocal variety in any public situation. It also provides the fundamentals of theatre work for the student who would like to continue his experience through local community theatre.

192 Basic Staging ..... 3 credit hours

Make-up; lighting; costuming; set design; the history of the theatre building from the Greeks to the present. (3-0)

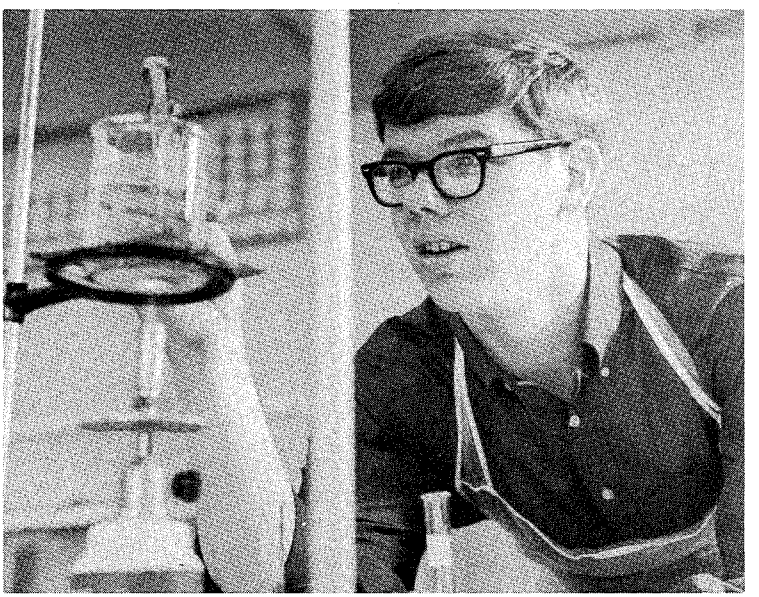
PHYSICAL EDUCATION

111 Basic Physical Education ..... 1 credit hour

A course designed to give each individual the techniques to develop himself physically, to understand the physiological factors affecting human exercise, and to participate in activities which have value for later adult life. A variety of activities such as basketball, badminton, volleyball, and gymnastics will be included. Combined activity and lecture periods will cover hygiene, health habits, and an appreciation and knowledge of sports as a spectator, as well as a participant. (0-2)

122 Basic Physical Education ..... 1 credit hour

A continuation of Basic Physical Education 111. (0-2)



DIVISION OF EXACT SCIENCES

BIOLOGY

111 General Biology ..... 4 credit hours

A survey of the major concepts and principles of biology. (3-4)

122 General Biology ..... 4 credit hours

Prerequisite: General Biology 111.

Biological principles as applied to higher life forms. Modern Biology (DNA, RNA, etc.) is included. (3-4)

127 Botany ..... 4 credit hours

Prerequisite: General Biology 111.

A survey of the plant kingdom including structure and function in the higher plants. (2-4)

128 Zoology ..... 4 credit hours

Prerequisite: General Biology 111.

The classification, evolutionary relationships and structure of major animal groupings. (2-4)

141 Basic Health Science ..... 4 credit hours

A core science course for health science students. Subject matter drawn from anatomy, physiology, bacteriology, microbiology, and pathology. (3-2)

217 Microbiology ..... 5 credit hours

Prerequisite: General Biology 111.

An introduction to the study of micro-organisms in which the morphology, physiology, and immunology of these organisms are studied. (3-6)

211 Anatomy and Physiology ..... 4 credit hours

Prerequisite: General Biology 111 or permission of the instructor.

Detailed studies of gross and microscopic anatomical structure of the human body and the function to structure relationships. Designed primarily for students on Health Science Programs. (4-2)

222 Anatomy and Physiology ..... 4 credit hours

Prerequisite: Anatomy and Physiology 211.

A continuation of Anatomy and Physiology 211. (4-2)

CHEMISTRY

57 Introductory Chemistry ..... 3 credit hours

A beginning course for the student who has no background in high school science or algebra. This course may be taken by the student wishing to improve his background before taking General Chemistry 111, or by the student desiring a terminal exposure to chemistry. Credit for Introductory Chemistry 57 is contingent on successful completion of either Introductory Chemistry Laboratory 58 or General Chemistry 111. (3-0)

58 Introductory Chemistry Laboratory ..... 1 credit hour

Prerequisite: Introductory Chemistry 57 (may be taken concurrently).

A laboratory course involved with the study of common chemical laboratory practices and procedures. (0-3)

111 General Chemistry ..... 4 credit hours

Prerequisite: High school Chemistry; 1 year high school Algebra.

A beginning general college chemistry course which includes chemical combination laws, states of matter, atomic and molecular structure, bonding and other basic principles. (3-3)

122 General Chemistry ..... 4 credit hours

Prerequisite: General Chemistry 111.

A study of chemical principles including ionic equilibria and elementary qualitative analysis. The accompanying laboratory will include elementary instrumental techniques. (2-4)

211 Organic Chemistry ..... 3 credit hours

Prerequisite: General Chemistry 122.

A lecture course dealing with the nomenclature, stereochemistry, and reactions of aliphatic and aromatic compounds. (3-0)

218 Analytical Chemistry ..... 4 credit hours

Prerequisite: General Chemistry 122.

A course involved with the study of the techniques of quantitative separation and determination of chemical substances. (2-6)

222 Organic Chemistry ..... 5 credit hours

Prerequisite: Organic Chemistry 211.

A course involving the study of the derivatives of aliphatic and aromatic compounds. The accompanying laboratory will stress techniques used in the preparation and handling of organic compounds. (3-6)

EARTH SCIENCE

100 Introductory Geology ..... 4 credit hours

A course designed primarily for students who desire to obtain a broad perspective of the science or as a first course to be followed by either physical or historic geology. Practical training in earth science, including work with minerals, rocks, fossils, maps, meteorology, astronomy, and oceanography, and field trips to points of geologic interest are included. (2-3)

109 Common Rocks and Minerals ..... 3 credit hours

Involved is the identification of rocks, minerals, and some fossils; the study of an area as revealed in rocks and minerals. Especially useful for prospective elementary school teachers. (3-0)

114 Physical Geology ..... 4 credit hours

Physical features of the earth with special reference to their origin and significance along with interpretation of topographic maps and the study of common rocks and minerals. Field trips are involved. (3-2)

115 Historical Geology ..... 4 credit hours

Prerequisite: Physical Geology 114.

A study of the development of North America as a typical continent, covering the formation of mountains, plains, and evolution of life on land and water; and the identification of fossils and interpretation of geologic maps. Field trips are involved. (3-2)

PHYSICAL SCIENCE

142 Physical Science ..... 4 credit hours

A core science course for health science students and others, which includes basic understanding of the science method. Subject matter will be drawn from physics, chemistry, and pharmacology. A study of the contributions of science to society is included. The emphasis is on science skills such as: observation, evaluation, experimentation, comparison, and reporting. (3-2)

MATHEMATICS

10 Notational Systems ..... 1 credit hour

A programmed course covering: the metric system, units and dimensions, exponential numbers, the slide rule, graphic display, and temperature. This course is desirable for all science students; it may be taken concurrently.

20 Math Lab ..... No credit

An opportunity for students to work on any mathematical difficulty or project under the direction and supervision of the mathematics staff. Students may avail themselves of this opportunity voluntarily or may be referred to the laboratory by an instructor. Program text material is utilized.

31 Developmental Mathematics ..... 3 credit hours

A review of mathematics involving whole numbers, fractions, decimals, and percentage. Diagnostic tests will be utilized to determine the appropriate area of concentration for each student. Students will have the opportunity to study supplementary units in modern mathematics and material preparatory to elementary algebra. (2-2)

32 Developmental Mathematics ..... 3 credit hours

Open only on recommendation of instructor.

A continuation of Developmental Mathematics 31. (2-2)

40 Introductory Algebra ..... 4 credit hours

Prerequisite: Developmental Mathematics 31 or proficiency examination.

Intended for the student who has not had high school algebra or who needs review. Basic concepts of algebra such as symbols, complex numbers, solution of linear equations, simultaneous equations, factoring, fractions, quadratics, and fractional equations are studied. (5-0)

98 Plane and Solid Geometry ..... 4 credit hours

Prerequisite: Introductory Algebra 40 or proficiency examination (equivalent to one year of high school algebra).

Review of simple geometric configurations; basic definitions and axioms for a logical system, development of notion of "proof", nature of deductive reasoning, concept of rectangular coordinates, directed line segments, loci, equation of straight line, equations of parallel and perpendicular lines, equation of circle; study of three-dimensional figures, lines and planes, angles, solid figures, geometry of the sphere. (4-0)

100 Business Mathematics ..... 3 credit hours

Mathematical processes necessary for business practice. A review of fundamentals of arithmetic, percentage, fractions, graphs, interest, taxes, insurance, and bonds. (3-0)

101 Integrated Mathematics ..... 3 credit hours

Prerequisite: Introductory Algebra 40 or equivalent (one year of high school algebra).

Intended for the student desiring an insight into the development of mathematics and its role in the evolution of our culture. Mathematical content is drawn from: arithmetic, algebra, geometry, probability, and statistics. Major emphasis is given to the ideas encountered with appropriate attention given to technical competence. An attempt is made to present the full significance of mathematics through its relationship to other branches of our culture. (3-0)

102 Integrated Mathematics ..... 3 credit hours

Prerequisite: Integrated Mathematics 101 or permission of instructor.

A continuation of the study begun in Integrated Mathematics 101. (3-0)

111 Mathematical Analysis ..... 4 credit hours

Prerequisite: Algebra and Trigonometry 140 or proficiency examination (equivalent to two years of high school algebra).

A study of the abstract nature of mathematics including sets, implications, methods of proof, number systems, mathematical induction, binomial theorem, vectors, matrices, determinants, inequalities, relations, algebraic and transcendental functions, trigonometric functions of a real variable, and graphing. This course is designed to provide the background for a solid study of calculus and analytic geometry. (4-0)

122 Calculus with Analytic Geometry ..... 5 credit hours

Prerequisite: Mathematical Analysis 111 or successful completion of four years of high school mathematics.

Course includes one and two dimensional analytic geometry, functions, limits, continuity, differentiation of algebraic, polynomial, trigonometric, exponential and logarithmic functions, integration of polynomial functions, and applications of the derivative and differential. (5-0)

127 Trigonometry ..... 2 credit hours

Prerequisite: Integrated Mathematics 101 or Algebra and Trigonometry 140 or proficiency examination (equivalent to two years of high school algebra).

Intended primarily for the student with a working knowledge of algebra and plane geometry who will not continue his study of mathematics but who will need the concepts in allied physics, engineering, or technical courses. The primary aims of the course are: to understand the properties of periodic functions as used in many areas of applied mathematics, increase proficiency in manipulative techniques, acquire facility in applying mathematical processes. Major content areas are: sets, relations, functions, trigonometric functions of angles; graphs of circular functions; vectors; polar coordinates; complex numbers; inverse functions; solutions of triangles; trigonometric identities; fundamental relations, complex numbers and series. (2-0)

128 Basic Statistics ..... 4 credit hours

Prerequisite: Integrated Mathematics 101 or Algebra and Trigonometry 140 or proficiency examination (equivalent to two years of high school algebra).

An elementary study of the tabulation of data, graphic representation, measures of central tendency and dispersion, probability, types of distributions, sampling, hypothesis testing, and elementary aspects of correlation. Intended as a basic course for students in Business Administration, Education, Psychology, Social Science, Engineering, and in all other fields in which measurements and predictions are made. (4-0)

130 Scientific and Technical Programming ..... 4 credit hours

A course in Fortran programming and basic mathematical techniques suitable for use with computers. Other computer languages are touched upon and some attention is given to numerical control. Selected programs will be written, compiled, and executed by the student. Suitable for both vocational and science students who will need to use mathematics and computers as tools of their professions. (3-2)

140 Algebra and Trigonometry ..... 4 credit hours

Prerequisite: Introductory Algebra 40 or proficiency examination (equivalent to one year of high school algebra).

Concepts previously developed in Introductory Algebra 40 are reviewed and extended, encouraging the student to learn and relearn in ever greater depth. The course is especially designed for the student who will continue his study of mathematics or science. The material covered is developed using the unifying ideas of sets, functions, and relations. Major content areas are: real numbers, relations and functions, lines and planes, quadratic equations, complex numbers, trigonometric functions, trigonometric sentences, polynomial functions, exponents and logarithms, sequences and series, probability, and applications. (4-0)

213 Calculus with Analytic Geometry ..... 5 credit hours

Prerequisite: Calculus with Analytic Geometry 122.

Includes the conic sections, parametric equations, hyperbolic functions, indeterminate forms, curve tracing, Newton's method, techniques of integration, definite integrals, areas and improper integrals. (5-0)

224 Calculus with Analytic Geometry ..... 5 credit hours

Prerequisite: Calculus with Analytic Geometry 213.

Includes surfaces, partial differentiation, applications, centroids, moments, multiple integrals, series, differential equations. (5-0)

229 Introduction to Numerical Analysis ..... 3 credit hours

Prerequisite: Calculus with Analytic Geometry 213 and Scientific and Technical Programming 130.

An introduction to mathematical methods applicable to the digital computer including finite differences, numerical integration and differentiation, solution of linear and non-linear equations and solution of ordinary differential equations with initial conditions. This course will also include the writing and executing of programs involving these methods. (3-0)

PHYSICS

91 Applied Physics ..... 4 credit hours

Fundamentals of electrical and radiation physics and the basic principles underlying the operation of X-ray equipment and auxiliary devices. (4-0)

92 Applied Physics ..... 4 credit hours

Prerequisite: Physics 91.

A continuation of Physics 91 with emphasis on construction and operation of X-ray equipment.

111 General Physics ..... 4 credit hours

Prerequisite: Algebra and Trigonometry 140 or two years of high school algebra. May be taken concurrently.

A study of length, mass, and time measurements; mechanics, work, and power; motion, acceleration, and kinematics; properties of matter and heat are included. Designed for both liberal arts and vocational students, this course concentrates on the science skills. The laboratory is of major importance. (3-3)

122 General Physics ..... 4 credit hours

Prerequisite: General Physics 111.

Includes units on electricity; light and atomic physics. (3-3)

211 Engineering Physics ..... 5 credit hours

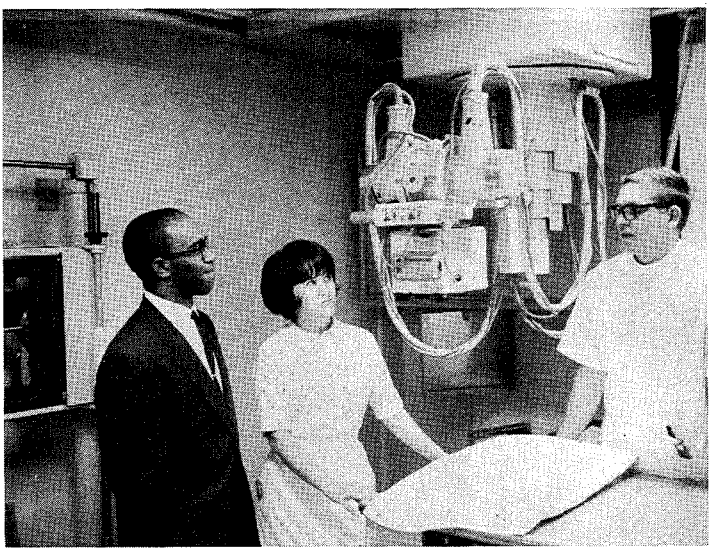
Prerequisite: High school physics or equivalent and Calculus with Analytic Geometry 122.

Course designed for engineering and science majors. Solution of problems dealing with mechanics, heat, and sound, utililizing physical principles and mathematical technique are involved. The Calculus is used. (4-3)

222 Engineering Physics ..... 5 credit hours

Prerequisite: Engineering Physics 211.

A continuation of Engineering Physics 211 stressing electricity, light, and atomic physics. (4-3)



DIVISION OF HEALTH SCIENCES

100 Clinical Practice and Work Experience for
Health Science Division ..... 1 - 6 credit hours

Most students who are enrolled in health occupation are required to meet certain registry requirements through clinical practice and work experience related to their health occupation specialty. Health occupation coordinators will inform students of the number of credit hours they will need to carry each semester. Additionally, students will be informed of the number of clock hours and content of the clinical or work experience through their health occupation coordinator. (3-40)

DENTAL ASSISTING

110 Orientation to Dental Assisting ..... 1 credit hour

Prerequisite: Admission to dental assisting curriculum.

General orientation to college and the history of dentistry. The role of the Dental Assistant Association, code of ethics, certification of dental assistants, and observation in dental offices. Dental jurisprudence and malpractice prevention are included in this course. (1-0)

111 Dental Science ..... 4 credit hours

Prerequisite: Orientation to Dental Assisting 110 (may be taken concurrently).

This course deals with dental terminology, histology; tooth growth, eruption and anatomy; physiology and anatomy of the head. (3-1)

121 Principles of Operatory Procedures ..... 4 credit hours

This is a study of the names and uses of dental instruments, preparation and care of patients, proper chairside assistance and operation of equipment, bacteriology and sterilization. (2-2)

122 Advanced Dental Science ..... 4 credit hours

Prerequisite: Dental Science 111.

Continuation of Dental Science 111. This is a study of the relation of oral health to general health, oral pathology, diet and nutrition, occlusions, drawing and wax carving of selected teeth to millimeter measurements. (2-2)

203 Dental Materials ..... 3 credit hours

Prerequisite: Advanced Dental Science 122.

Chemical properties and uses of dental materials and solutions; manipulative techniques, dental pharmacology and anesthesia are included in this course. (3-1)

213 Dental Roentgenology ..... 3 credit hours

Prerequisite: Dental Science 111 and Advanced Dental Science 122.

Principles, practices, and precautions in the operation of dental X-ray units are studied. This course also involves instruction and practice in making intra-oral and extra-oral X-ray exposures; processing and mounting X-ray films are included. (1-3)

212 Advanced Operatory Procedures ..... 4 credit hours

Prerequisite: Principles of Operatory Procedures 121.

Office practices as related to operating procedures, case history records, treatment planning, and estimates are involved in this course. (2-2)

214 Principles of Dental Laboratory Procedures ..... 3 credit hours
Prerequisite: Dental Materials 203; Advanced Operatory Procedures 212 (may be taken concurrently).

This is a study of the practice of manipulation of cold cure acrylic material in making custom impression trays, retainers, and minor denture repairs; preparation of impression materials, use of dental laboratory equipment and storage of laboratory supplies. (2-2)

225 Advanced Dental Laboratory Procedures ..... 3 credit hours
Prerequisite: Principles of Dental Laboratory Procedures 214.

This course involves carving inlay patterns, investing and casting inlay restorations; pouring of plaster and stone cases; making stone, amalgam, and copper electroplated dies. (2-2)

INHALATION THERAPY

111 Inhalation Therapy Procedures ..... 3 credit hours

This is a comprehensive course dealing with the equipment used by the Inhalation Therapist Technician. The course involves principles of operation, makes and models, advantages, maintenance and repair, methods and the demonstration and practice of the various analyzers and tests, chambers and hoods, humidifiers and inhalators, humidity rooms, masks and catheters, nebulizers and aerosols, resuscitators, respirators, regulators and manifold, tents and incubators. (2-2)

113 Nursing Arts for Inhalation Therapy ..... 3 credit hours

The nursing problems relative to patients receiving Inhalation Therapy will be presented, analyzed, and discussed. The organization of the hospitals and public health nursing services will be discussed. The relationship of the nursing service, inhalation therapy and physical therapy will be presented. Practical demonstrations in nursing and physical therapy procedures will be given. (3-0)

122 Inhalation Therapy Procedures ..... 3 credit hours
Prerequisite: Inhalation Therapy Procedures 111.

This course is a continuation of Inhalation Therapy Procedures 111. (2-2)

124 Nursing Arts for Inhalation Therapy ..... 3 credit hours
Prerequisite: Nursing Arts for Inhalation Therapy 113.

This course is a continuation of Nursing Arts for Inhalation Therapy 111. (3-0)

125 Introduction to Applied Inhalation Therapy ..... 1 credit hour

This course of study is designed as an introduction to the major unit in Inhalation Therapy. The trainees will receive classroom instruction concerning the use of Inhalation Therapy as related to the various medical and surgical specialties. (1-0)

136 Applied Inhalation Therapy ..... 3 credit hours

This course is a continuation of Introduction to Applied Inhalation Therapy 125. Major emphasis in this class will be placed on practical, bedside teaching: (1) emergency and accident room (2) internal medicine (3) obstetrics (4) pediatrics (5) surgery, general (6) surgery, thoracic and (7) neurosurgery. (3-0)

219 Seminar — Inhalation Therapy ..... 3 credit hours

In this course, four hours every week will be scheduled for seminar discussions of current problems, therapeutic complications, review of current literature, reports of scientific meetings, and round table discussions. (3-0)

MEDICAL OFFICE WORKER

111 Introduction to Medical Assisting ..... 3 credit hours

What is medical assisting? In this course, the student will explore the general field of assisting, including the history of medical practice, the ethics involved in medical practice as they relate to the conduct of the medical assistant. The student will be introduced to nursing aid techniques and begin study of the practice of routine office duties, such as, general office hygiene, care and use of equipment and the importance of supply inventory. Medical terminology will also be introduced, i.e. the instruments and their names and use, care and the ability to identify the equipment and its function. Field visitations will be arranged. (3-0)

120 Medical Terminology ..... 3 credit hours

See X-Ray Technology for course description.

122 Medical Assisting ..... 4 credit hours

This course is a continuation of the series. Emphasis will be placed on the study of diseases, their etiology, symptoms and treatment. The student will also study normal body functioning and the effects of improper care on these functions (i.e. nutrition). Elementary first aid, bandaging techniques, and standardized methods of dressing will be explored. (4-0)

X-RAY TECHNOLOGY

111 Fundamentals of X-Ray Technology ..... 4 credit hours

This course includes the practical and theoretical aspects of medical radiology technology. The production and control of X-radiation and its ionizing effect on matter will be emphasized. Instruction will also be given in X-ray films, film holders, grids, the photographic effect of X-rays and X-ray protection. (4-1)

122 Fundamentals of X-Ray Technology ..... 4 credit hours

Prerequisite: Fundamentals of X-Ray Technology 111.

This course is a continuation of the fundamental concepts of radiologic techniques. (4-1)

213 Principles of X-Ray Technology ..... 4 credit hours

Prerequisite: Fundamentals of X-Ray Technology 122.

This course is designed to give the student instruction in nursing procedures pertinent to X-ray technology, special procedures, introduction to radiation therapy and topographic anatomy. (4-1)

224 Principles of X-Ray Technology ..... 4 credit hours

Prerequisite: Principles of X-Ray Technology 213.

This course is outlined for a general review. Included in the course is automatic processing maintenance, oral radiography, research for the radiologic technologist, radioisotopes, and civil defense and disaster planning. (4-1)

120 Medical Terminology ..... 3 credit hours

A study designed to acquaint the student with the origin and structure of medical terms. The intent of this course is to help the student interpret and understand requests for radiographic examinations and to read and understand medical articles and reports. (3-0)

DIVISION OF HOSPITALITY AND COMMUNITY SERVICE OCCUPATIONS

100 Work Experience ..... 1 - 6 credit hours

Washtenaw Community College provides students in both General and Occupational programs an opportunity to earn credits while engaged in supervised and usually subsidized work experience directly related to the educational or occupational objective of the student. Students who plan on enrolling for work experience credit must first review their plans with their academic adviser and the appropriate divisional director and then secure the director's permission. Work experience credits may be applied to the certificate of achievement or the associate degree. No more than twelve credit hours of supervised work experience may be applied to the associate degree requirements and no more than six for a certificate of achievement.

LIBRARY

111 Library Practice ..... 4 credit hours

This is an introductory course for General Library Aides, Medical Library Aides, and Legal Assistants. This course includes cataloging, shelving, and display of materials. Inventory and circulating procedures and materials maintenance are studied. (2-4)

122 Library Technical Processes ..... 4 credit hours

This course includes library management and supervision, budgeting, requisitioning, updating, and materials preparation. (2-4)

DIVISION OF SOCIAL SCIENCES

ECONOMICS

100 Personal Finance ..... 3 credit hours

A basic economics course covering cost of establishing and maintaining a household; problems of consumer credit; installment buying; taxes; major costs of families; basic economic principles, insurance, stocks and bonds, mortgages; social security, Medi-care, and other topics. (3-0)

101 U. S. Economic History ..... 3 credit hours

Survey of American economic progress from colonial period to the present. Charts growth of agriculture, industry, transportation, money and banking, growth of corporate enterprise, labor organizations, other commercial and industrial institutions. Also seeks to explain government regulation of business. (3-0)

211 Principles of Economics ..... 3 credit hours

Study of the American economic system including the nature of economics, resources, business organization in the United States, pricing and allocation of resources, distribution of income. Required of all business administration transfer students. (3-0)

222 Principles of Economics ..... 3 credit hours

Prerequisite: Successful completion of Principles of Economics 211.

Continuation of principles including money, banking, price levels, volume of economic activity, public finance, international economics, and economic growth. Required of all business administration transfer students. (3-0)

207 Basic Economics Principles ..... 4 credit hours

A one-semester college-transfer course intended for liberal arts and pre-professional students who will take only one course in economics. It is not intended for economics or business majors. Will provide the student with a framework for more systematic thought about economic matters. Areas studied include: nature and scope of economics, essentials of income data, prices, income, employment, distribution of income, role of the banking system, business fluctuations, economic growth, the functioning of the American economic system and alternate economic systems. (4-0)

250 Economics of Administrative Action

Conflict resolution, game theory, problems of economic organization and coordination. Problem-solving in micro-economic situations.

GEOGRAPHY

100 Earth Science ..... 4 credit hours

Study of fundamental earth patterns and distributions with special emphasis on geologic history of the earth, life from its evolutionary beginnings, the physiographic face of the land, the universe, and some emphasis on meteorology and weather patterns. (4-0)

107 Human Geography ..... 4 credit hours

Introductory course designed to aid students in developing the ability to view people, nations, and current happenings in their proper environmental settings. Involves a study of selected natural regions of the world and their utilization by the people of different cultural backgrounds. (4-0)

108 Introduction to Physical Geography ..... 3 credit hours

Topics most closely related to human environment — climate, landforms, surface water, soils, vegetation — will be stressed. The course is designed to provide a thorough grounding in environmental science. (3-0)

200 Geography of Anglo-America ..... 3 credit hours

Geographic interpretations of the major regions of North America comparing and contrasting the natural and cultural factors of the various regions. Attention to migrations and routes of the colonizers together with problems encountered in developing each part of the continent for human use. (3-0)

207 Geography of Europe ..... 3 credit hours

Geographic interpretation of Europe as a continent and the adjustment man has made economically, politically, and socially to its location, size, and various natural regions. (3-0)

208 Conservation ..... 3 credit hours

Analysis of the problems facing man in the conservation of water, mineral, timber, oil, gas, and the flora and fauna resources native to the United States. Implication for the future. Some emphasis to Michigan and the depletion of resources within the state as well as to methods of control. (3-0)

HISTORY

101 Western Civilization to 1500 ..... 4 credit hours

Cultural and institutional development of the early Orient and Classical and Medieval Europe will be stressed. Students planning to transfer to a senior college are expected to take History 101 and History 102 in the freshman year. (4-0)

102 Western Civilization Since 1500 ..... 4 credit hours

A study of cultural developments and growth of institutions from 1500 to the present. Emphasis upon the expansion of European civilization. A foundation for the understanding of contemporary world problems. (4-0)

107 Introduction to East Asian Civilization ..... 3 credit hours

A survey of the geography, history, and culture of East Asia. Primary emphasis will be placed on the impact of Western Civilization on the peoples of East Asia and the subsequent transformation of East Asian civilization. 1500 to the present. (3-0)

130 Evolution of American Democracy ..... 3 credit hours

A study of American democracy through the rise of our political institutions. Influence of the frontier, frontier individualism, sectionalism, the implication of disunion in the Civil War, growth of industry, labor movement, social reform programs and the present world responsibilities of the United States are considered. Students who have enrolled in United States, 1500-1865 201 or United States, 1865 - Present 202 may not elect this course. (3-0)

201 United States, 1500 - 1865 ..... 3 credit hours

Introductory American history from pre-Columbian Europe to the close of the Civil War. Broad survey with emphasis on the growth of institutions and ideals as they were brought from Europe and modified and developed here. (3-0)

202 United States, 1865 - Present ..... 3 credit hours

General survey of American society and politics since the Civil War. Special emphasis on social and cultural factors as well as politics. A continuation of United States, 1500 - 1865 201, but no prerequisite necessary. (3-0)

207 Development of American Culture ..... 3 credit hours

Development of American culture from colonial period to the present. Especially recommended for students contemplating a career in teaching, or in the social science. (3-0)

208 The Rise of the Modern West ..... 3 credit hours

A survey devoted to in-depth study of selected topics in the political, economic, social, cultural, and intellectual development of Western civilization since the Renaissance. The main theme will be the rise of the Western nations to a position of preeminence in the modern world. (3-0)

POLITICAL SCIENCE

100 Introduction to Political Science ..... 3 credit hours

A course emphasizing the general principles and problems of modern government, with emphasis on American institutions and experience; place of government in the social process, nature of political organization, authority and freedom, forms of government and theories of the state; techniques, processes, and machinery of popular control (public opinion, interest groups, parties and elections); executive, legislative and judicial functions. Modern philosopies of government, relations among nations, and subordinate units of governments are mentioned. MEETS THE MINIMUM REQUIREMENTS OF MICHIGAN LAW FOR THE ASSOCIATE DEGREE. (3-0)

107 Comparative Government ..... 3 credit hours

An introductory comparative functional analysis of the governmental structures, institutions, and politics of modern government. Emphasis will be given to authoritarian states including: the USSR, People's China, Fascist Italy, and Nazi Germany and to Democratic states including: Great Britain, France, West Germany, and The Republic of Italy. Introductory analysis of the dynamics of political behavior in the developing societies will be included in the course. (3-0)

108 American Government: Issues and Policies ..... 3 credit hours

An introductory study of the policy-making processes in America. Analysis and discussion of the most outstanding problems affecting public policy is undertaken particularly in the areas of civil rights, civil liberties, foreign affairs, national defense, public welfare, government and the economy, and federal-state relations. (3-0)

200 International Relations ..... 3 credit hours

An introduction to the nature and problems of international politics. An examination of the development of the modern state system, nationalism and imperialism. The techniques and instruments that govern international relations, power politics, and international organization in the nuclear age are analyzed. (3-0)

209 Contemporary Political Ideologies —
The Isms ..... 3 credit hours

A systematic analysis of basic contemporary political ideologies. Origins and evolution of the major political theories of the modern age with particular emphasis on democracy, socialism, communism, fascism, and nationalism. (3-0)

230 Political Parties ..... 3 credit hours

An analysis of American political parties and pressure groups; emphasizes their origins, functions, organization, methods, and the relationship between party politics and public opinion. (3-0)

237 Formation of Foreign Policy ..... 3 credit hours

The formulation, conduct, and control of American foreign relations. Basic principles, problems and instruments of foreign policy of other major powers are compared. Major factors influencing the course of U. S. policy in key areas of the world. (3-0)

240 State and Local Government and Politics ..... 3 credit hours

Forms and functions of state and local governments in the United States; the growth of the urban community in America and consequent development of its social and political problems. The organization and process of government in the urban complex with interactions of city, town, state, and metropolitan-wide governments analyzed. Methods of studying community decision-making will be evaluated. Michigan, Washtenaw County communities, and metropolitan Detroit will be drawn upon frequently for resource material and for purposes of illustration. (3-0)

PSYCHOLOGY

100 Introductory Psychology ..... 3 credit hours

An introduction to the scientific study and interpretation of human behavior, surveying such topics as psychological development, learning, thinking, motivation, emotions, perception, intelligence, aptitudes, and personality. Basic principles and their practical application are discussed. (3-0)

107 Psychology of Adjustment ..... 3 credit hours

A study of the processes involved in the adjustment of the individual to the problems of everyday living. Emphasis given to the study of the development of techniques of adjustment to meet conflict situations in the social environment. (3-0)

200 Child Psychology ..... 3 credit hours

Stresses the child as an individual, his original nature and temperament, and his position as part of the group. Introduction of social raw materials is considered. In addition, such topics as the conditioning and re-conditioning of behavior patterns, and the individuality and similarity of responses are developed. (3-0)

209 Marriage and the Family ..... 3 credit hours

Designed for all students, the aim of the course is to promote stable marital relations. Special emphasis on the psychology of sex, adjustment of the individual to problems of everyday living, techniques of adjusting to conflict situations, emotions, perception, personality. (3-0)

SOCIAL SCIENCE

100 American Civilization ..... 3 credit hours

Preparation of the student for participation in American society by helping the student understand his cultural heritage. This is accomplished through the analysis of selected aspects of present American society. The student will consider such topics as International Problems of the United States; Labor-Management Relations; The Development of Trade Unionism; Political Issues of the 1960's; and Civil Rights Issues. Emphasis will be on an analysis of each problem with a search for causes and effects, and an effort to think through to a solution. (3-0)

107 Human Behavior ..... 3 credit hours

Will make some contribution to student competence in maintaining mental health, developing a balanced adjustment, and in developing a satisfactory family life. Content will be drawn as needed from psychology, sociology, biology, and other disciplines. Goal of the course is personal and intellectual growth of the student with emphasis on adjustment to his environment. (3-0)

108 Man and Society ..... 3 credit hours

Covers the basic ideas in the fields of sociology and political science for students who plan to terminate their careers at the end of two years. Emphasis is placed on the social bases of law and government, with particular emphasis placed on the operation of American national and state governments. MEETS THE MINIMUM REQUIREMENTS OF MICHIGAN LAW FOR THE ASSOCIATE DEGREE. (3-0)

201 Michigan: Geography and History to 1837 ..... 3 credit hours

A comprehensive survey of the various types of natural resources and regions within the state and of the cultural adjustment man has made to natural conditions through the Territorial Period. Special emphasis will be placed on points of history with geographic interest. The economic, social, and political development of the territory is shown as a part of the history of the Great Lakes area. (3-0)

202 Michigan: Government and History Since 1837 ..... 3 credit hours

A continuation of Michigan Geography and History to 1837 201, with special emphasis on the state constitution, legislative, executive, and judicial function, and the powers of the state and principal activities of the state. Attention is given to state-local relations and to county and municipal governments. (3-0)

SOCIOLOGY

100 Principles of Sociology ..... 3 credit hours

Emphasis is placed on basic concepts used in an analysis of social behavior and the processes by which new members of group are oriented to prevailing patterns of behavior. A study of the process of cultural change basic to all programs in social work, or advanced work in the social sciences. (3-0)

107 Modern Society ..... 3 credit hours

Problems of satisfying human needs and wants are considered. These include socio-psychological (non-economic) needs and wants as well as treatment of the ways in which resources are allocated and products distributed in response to economic needs and wants. Emphasizes cross-cultural and historical perspectives. The significance of change through time, of continuing transition to industrialism with the major theme being the disruptive disparity between the rates of technological and societary change and consequent need to cultivate sciences concerned with human behavior. (3-0)

130 Population Problems ..... 3 credit hours

Social problems related to population trends. Births, deaths, and migration in relation to economic and social organization and natural resources. (3-0)

140 Delinquent Behavior of Youth ..... 3 credit hours

Growing up process of late childhood and adolescence from sociological and cultural viewpoint. Problems of the individual in his social environment and group forces which lead to his maladjustment and sociological principles for working with youth from the viewpoint of parent, teacher, police, and youth organization leader. (3-0)

200 Introduction to Anthropology ..... 3 credit hours

Introduction to the principal fields of anthropological study and fundamental concepts in terms of their concern with the nature of man as it is revealed in his development of culture. (3-0)

DIVISION OF
TECHNICAL
AND
INDUSTRIAL

100 Work Experience ..... 1 - 6 credit hours

Washtenaw Community College provides students in both General and Occupational programs an opportunity to earn credits while engaged in supervised and usually subsidized work experience directly related to the educational or occupational objective of the student. Students who plan on enrolling for work experience credit must first review their plans with their academic adviser and the appropriate divisional director and then secure the director's permission. Work experience credits may be applied to the certificate of achievement or the associate degree. No more than twelve credit hours of supervised work experience may be applied to the associate degree requirements and no more than six for a certificate of achievement.

ARCHITECTURAL DRAFTING

108 History of Architecture ..... 2 credit hours

A study of architectural development and some influencing factors. (2-0)

111 Architectural Drawing ..... 5 credit hours

Prerequisite: 2 years high school drawing or Technical Drawing 100.

Specific drawing problems and the presentation of their solution in the architectural idiom are studied. (2-10)

117 Construction Materials ..... 3 credit hours

A survey of basic materials and methods used in the construction industry. (3-0)

120 Mechanical Equipment ..... 2 credit hours

A survey of heating, ventilating, plumbing, and electrical equipment used in building construction is reviewed. (2-0)

122 Architectural Drawing ..... 5 credit hours

Prerequisite: Architectural Drawing 111.

An introduction to residential construction and requirements including the preparation of working drawings for building contractors and custom homes. (2-10)

200 Specifications ..... 1 credit hour

An introduction to the organization and preparation of contract specifications for building construction. (1-0)

207 Estimating Construction Costs ..... 3 credit hours

Prerequisite: Construction Materials 117, Mechanical Equipment 120.

An introduction to the methods of estimating construction costs for building construction projects involving the use of materials, labor, equipment, methods of computing overhead and profit are included. (2-2)

209 Surveying ..... 3 credit hours

Prerequisite: Algebra and Trigonometry 140 or equivalent.

A lecture and field course on the process of surveying and the analysis of the data collected. (2-2)

210 Structure in Architecture ..... 2 credit hours

An introduction to the use of structural members (i.e., steel, timber, and reinforced concrete, etc.) (2-0)

213 Architectural Drawing ..... 5 credit hours

Prerequisite: Architectural Drawing 122.

Major problems in architectural drawing are studied through the preparation of drawings and cost estimates for a moderate sized building such as a school or church. (2-10)

224 Architectural Drawing ..... 5 credit hours

Prerequisite: Architectural Drawing 213

Major problems in architectural drawing are presented through the preparation of drawings and cost estimates for a large size building project such as a shopping center or multi-story apartment. (2-10)

122 Architectural Rendering ..... 2 credit hours

See Technical-Commercial Art for course description.

INDUSTRIAL DRAFTING

100 Technical Drawing ..... 3 credit hours

The graphic language, free hand sketching, lettering, pictorial drawing, orthographic drawing, techniques, geometry of technical drawing, auxiliaries, and related technical terms. (2-4)

107 Mechanisms ..... 3 credit hours

The principles of linkage, cams, centros, displacements, motions, velocities, mechanisms, and vectors are studied and their applications presented graphically. (2-4)

110 Perspective and Parallel Line Projection ..... 3 credit hours

See Technical-Commercial Art for course description.

111 Drafting ..... 3 credit hours

Prerequisite: Technical Drawing 100 or two years of high school drafting.

Standard practice and procedures, materials, tool design standards, commercial standards, cutting tools and production tooling are included in this basic course. (2-4)

112 Descriptive Geometry ..... 3 credit hours

Prerequisite: Technical Drawing 100 or consent of divisional director.

The study of points, lines, and planes and their relationships in space. Emphasis is given to the practical application of principles to actual problems as they occur in industry. (2-4)

122 Fundamentals of Jigs and Fixtures ..... 3 credit hours

Prerequisite: Drafting 111 and Descriptive Geometry 112.

The various basic types of jigs, fixtures and their combinations are studied. The use of standard parts catalogs and the development of skills applicable to detailing and assembly drawing are stressed. (2-4)

123 Basic Design ..... 3 credit hours

See Art (Division of Communication Arts) for course description.

213 Fundamentals of Die Drafting ..... 3 credit hours

Prerequisite: Fundamentals of Jigs and Fixtures 122.

An introduction to the principles, types, nomenclature, and standards of dies. Special attention is given to the use of manuals and catalogs as well as standard detailing and assembly-drawing practices. (2-4)

224 Fundamentals of Industrial Tooling ..... 3 credit hours

Prerequisite: Fundamentals of Die Drafting 213.

An introductory course in the principles of industrial tool design. The course material also provides for practice in production scheduling, cost analysis, specification preparation, and drafting for numerical controlled machining. (2-4)

TECHNICAL-COMMERCIAL ART

110 Perspective and Parallel Line Projection ..... 3 credit hours

Prerequisite: Technical Drawing 100 or consent of counselor.

Introduction to one, two, and three vanishing point perspective drawing and oblique, isometric, dimetric, and trimetric methods of projecting lines and planes. (2-4)

121 Advertising Layout ..... 3 credit hours

Prerequisites: Perspective and Parallel Line Projection 110, Basic Drawing 111, Basic Design 112 (See Art, Division of Communication Arts, for course description of preceding two courses).

Introduction to layout and lettering techniques and methods used in commercial advertising forms, brochures, posters, advertisements, key line and final art. (2-4)

122 Architectural Rendering ..... 3 credit hours

Prerequisite: Perspective and Parallel Line Projection 110 or consent of teacher-counselor.

Interior and exterior rendering problems using ink, pencil, pastel, colored pencil, wash techniques, and other methods for various reproduction requirements. (1-4)

213 Airbrush Techniques ..... 3 credit hours

Prerequisite: Perspective and Parallel Line Projection 110, Architectural Rendering 122.

Introduction to airbrush rendering using various compatible media and forms and the rendering of assigned problems in art work and photographic retouching. (2-4)

214 Photography ..... 2 credit hours

Prerequisites: Basic Drawing 111, Basic Design 123 (See Art, Division of Communication Arts, for course description).

Introduction to photography, composing the picture, lighting, use of the light meter and exposure study; the use of photography as a communication form; assigned problems using the still camera. (1-3)

225 Model Construction ..... 2 credit hours

Prerequisites: Perspective and Parallel Line Projection 110, Basic Drawing 111, Basic Design 123 (See Art, Division of Communication Arts, for course description of preceding two courses) or consent of teacher-counselor.

Model construction using information from blueprints, schematics, sketches, and other communication form; the use of wood, clay, cardboard, and other media for construction; assigned problems. (1-3)

236 Study Problems ..... 2 - 8 credit hours

Prerequisite: Consent of divisional director or teacher-counselor.

Directed work in major study area; a period of concentrated effort to assigned problems; the demonstration of the individual's development of understanding and skill development. (Arranged)

MATERIALS AND PROCESSES

AUTO BODY REPAIR

111 Auto Body Repair and Painting ..... 6 credit hours

Co-requisite: Fundamentals of Welding and Fabrication 100.

An introductory course designed to evaluate the student's interests and capabilities and to provide instruction in the fundamentals of sheet metal repair. Construction of the various auto body styles and methods of repair and painting of damaged panels are studied. (3-15)

122 Auto Body Repair and Painting ..... 6 credit hours

Prerequisite: Auto Body Repair and Painting 111.

A continuation of Auto Body Repair and Painting 111. Assignments progress from repairing simple dents and making minor repairs to using remote control hydraulic jacks and accessories to make extensive repairs on damaged bodies. Customer cars provide the student diversified experience on body trim and hardware, panel replacement, aligning various body components, and the refinishing of complete automobiles. (3-15)

200 Collision Estimating ..... 3 credit hours

A lecture-laboratory course designed to expose the student to methods of establishing realistic prices in estimating physical damage to automobiles. Modern methods of repair are demonstrated and emphasis is placed on the cost of repairing as opposed to replacing damaged body sections. Procedures used to obtain complete and accurate estimates are stressed. (2-4)

207 Auto Air Conditioning ..... 3 credit hours

This is an introductory course to the principles of refrigeration and atmospheric control related to automotive equipment and includes the installation and servicing of such equipment. (2-2)

213 Body Alignment and Collision ..... 6 credit hours

Prerequisite: Auto Body Repair and Painting 122.

For the student who wishes to specialize in major collision service. The use of portable frame and body straighteners to straighten conventional frames and restore unitized bodies to their original dimensions and alignment are included. Three common types of impacts will be selected for study as being representative of front end, rear end, and side collision damage. (3-15)

224 Body Alignment and Collision ..... 6 credit hours

Prerequisite: Body Alignment and Collision 213.

A continuation of Body Alignment and Collision 213. Students are expected to make practical application of all technical materials and methods studied in their previous course work. Students are also expected to develop standards in quality and quantity of work produced to be employable as a body repairman. Collision estimating and shop management procedures are further developed. (3-15)

MECHANICAL TECHNOLOGY

100 Introduction to Numerical Control ..... 2 credit hours

An introductory course in the principles and applications of numerically programmed control or manufacturing equipment. Special emphasis is given to tape systems and some specific applications. (1-2)

101 Blueprint Reading ..... 3 credit hours

Elementary blueprint reading for: pre-engineer, machine operator, machine repairman, electronic technician, metal fabricator. (3-0)

101A Blueprint Reading (Construction Trade) ..... 3 credit hours

Elementary blueprint reading for persons in the construction trades. Architectural construction prints and drawings are used as the basis for instruction. (3-0)

102 Blueprint Reading ..... 3 credit hours

Prerequisite: Blueprint Reading 101.

Advanced blueprint reading is studied. Included are tool, jig and fixture, die, and body prints. (3-0)

111 Shop Orientation ..... 2 credit hours

Function and usage of small tools and measuring devices are included. Films on toolroom machinery operations are shown and studied. Field trips to tool shops and production shops are made. Shop theory and safety are stressed. (1-2)

122 Shop Orientation ..... 2 credit hours

Shop layout problems on steel using surface plate, sine bar, and height gage. Techniques and usage of various checking instruments such as: gages, indicators are included. Field trips to foundry and die casting shops are made. (1-2)

200 Field Test Instruments ..... 2 credit hours

An overview of the types of equipment test persons, quality control personnel, and other field persons used to gather data. Included will be automotive test equipment, shadow-graph, comparators, and similar types of equipment. (2-0)

201 Shop Technology ..... 3 credit hours

Prerequisite: Shop Orientation 122 or consent of instructor.

Machine operations involved with the lathe, shaper, milling machine. Grinder and other shop machines. Construction of simple jigs, fixtures, and gages are included. (2-4)

202 Machinery Construction and Repair ..... 4 credit hours

Prerequisite: Shop Orientation 122.

Basic machinery construction and mechanisms are studied. Overhaul, inspection testing, checking parts, parts replacement, and adjustments of shop equipment are included. (2-8)

METALLURGY

111 Industrial Materials ..... 3 credit hours

A study of the manufacture and properties of materials: metals, alloys, cement, clay products, plastics, fuels, etc., and how each is utilized in the industrial world. (2-4)

122 Metal Processing ..... 3 credit hours

Prerequisite: Industrial Materials 111.

An introductory study of the principles and practices of working, heat treating, and welding of ferrous and certain nonferrous alloys. The effect of these processes on the mechanical properties and the micro-structure are studied in the classroom and evaluated in the laboratory. (2-4)

123 Basic Metallurgy ..... 2 credit hours

Prerequisite: Industrial Materials 111.

Basic engineering metallurgy covering the properties and heat treatment of steels and some non-ferrous alloys and pointing out the advantages, limitations, and control of the various means of fabricating metals. Methods of fabrication such as: casting, electro-forming, mechanical working, joining, and machining are studied. (1-3)

214 General Metallography ..... 3 credit hours

Prerequisites: Metal Processing 122, Basic Metallurgy 123.

The grain structure of metals and alloys as related to their properties; the effects of heat treatment and fabricating methods on the grain structure that determines and limits their use are stressed. (2-4)

215 Mechanical Testing ..... 2 credit hours

Prerequisite: Consent of the teacher-counselor.

A combination lecture and laboratory course on the mechanical testing of materials (mainly metallic specimens) when subjected to the following tests: tension, compression, shear, impact, torsion, fatigue, and hardness. (1-3)

221 Quantitative Analysis ..... 2 credit hours

Prerequisite: General Metallography 214.

A laboratory course in introductory qualitative and quantitative analysis. In the qualitative, three primary groups of metals are analyzed; in quantitative, carbon, silicon, sulphur, phosphorus, manganese, and chromium contents of these primary metals are determined. (1-3)

222 Advanced Metallography ..... 3 credit hours

Prerequisite: Consent of the teacher-counselor.

Advanced study of the effects of the heat treat on the microstructure of plain carbon and alloy steels, and cast iron. (2-4)

223 Spectroscopy ..... 3 credit hours

Prerequisite: Consent of the teacher-counselor.

An introductory course concerned with the principles of spectrochemical analysis. The refraction and diffraction of light by prism and grating, the photographic process, the care and manipulation of length comparators, and the spectroscope along with its excitation source are studied. The course is designed to be of interest to the student seeking a qualitative knowledge of the fundamental ideas of spectroscopy along with laboratory familiarity with the equipment. (2-4)

WELDING AND FABRICATION

100 Fundamentals of Welding and Fabrication ..... 2 credit hours

A basic combination welding course that deals with oxy-acetylene and arc welding. Designed to meet the needs of students enrolled in Auto Body Repair, Auto Mechanics, Detailer Draftsman, etc. Basic theory is included in the course instruction. (1-5)

111 Welding and Fabrication ..... 6 credit hours

Students may elect 111A Welding and Fabrication — 3 credit hours and/or 111B Welding and Fabrication — 3 credit hours.

Fundamental understanding and skill in the use of oxy-acetylene and arc welding equipment are developed on typical operations such as butt, lap, and fillet welds using bare and shielded, straight polarity and reverse polarity electrodes on mild steel plate, also using filler rods for oxy-acetylene operation. A basic knowledge of cast iron welding and brazing and silver soldering are included. (3-15)

122 Welding and Fabrication ..... 6 credit hours

Students may elect 122A Welding and Fabrication — 3 credit hours and/or 122B Welding and Fabrication — 3 credit hours.

Advanced instruction in oxy-acetylene and arc welding of "out of position" welded joints in both mild steel plate and pipe. Procedures are covered for cutting, beveling, fabricating, and welding various joints on steel plate and pipe. Related theory, codes, and standards are included. (3-15)

213 Welding and Fabrication ..... 3 credit hours

Prerequisite: Welding and Fabrication 122.

Instruction is given in tungsten, inert-gas, shielded-arc welding with manually operated torch on such metals as aluminum, mild steel, and stainless steel. Technical theory directly related to Tig welding including the composition and properties of metals is included in the course. (1-6)

224 Welding and Fabrication ..... 3 credit hours

Prerequisite: Welding and Fabrication 213.

Instruction is given in specialized oxy-acetylene welding, inert-gas, shielded-arc, and consumable carbon dioxide welding. Emphasis is given the welding of various metals such as aluminum, stainless steel, high alloy steels, and cast iron. Procedures for welding of the exotic metals such as titanium, tantalum, columbium, zirconium, and molybdenum are included. (1-6)

AUTOMOTIVE SERVICE

111 Automotive—Basic Service ..... 6 credit hours

Required of all students preparing for employment in the automotive service field. The instruction consists of lectures, demonstrations, and actual shop work covering the principles and procedures of the following components: suspension and brake systems, fuel systems, engine and electrical systems. (3-15)

122 Automotive—Service ..... 6 credit hours

Prerequisite: Automotive—Basic Service 111.

The principles, construction, and operation of transmissions and power train components. The methods of servicing and repairing engine, fuel, and electrical units are included. At the completion of this course, the student has acquired the necessary background to repair and service the automobile with reasonable skill. (3-15)

150 Automotive Service Station Mechanic ..... 6 credit hours

Prerequisite: Automotive—Basic Service 111.

This course is designed for students preparing for employment as service station mechanics. Students will be expected to acquire a reasonable degree of skill in service and repair in the following areas: quick car service, carburation, motor tune-up, and analyzing. (3-15)

213 Automotive—Diagnosis and Service ..... 6 credit hours

Prerequisite: Automotive—Service 122.

A survey of the scientific test instruments necessary to accurately diagnose and repair engine troubles. The principles, procedures, and methods of servicing and repairing components of the following systems are studied: air conditioning, transmissions, power trains, brakes, suspension, and tune-up. (3-15)

224 Automotive — Diagnosis and Repair ..... 6 credit hours

Prerequisite: Automotive—Diagnosis and Service 213.

This course is designed for those who desire to specialize in automotive diagnosis and repair. The shop work follows the pattern of commercial garages. Vehicles will first undergo a complete diagnosis to determine troubles, and will then be corrected on the basis of the diagnostic report. Experiences are provided on all major mechanical and electrical units of the automobile. Test lane procedures are also included. (3-15)

ELECTRICITY — ELECTRONICS

90 Introductory Electricity ..... 4 credit hours

Introductory course for the beginning student who has had no previous instruction in electricity-electronics. Instruction in basic fundamentals is given to enable the student to prepare a solid background for further study. Units included in the course: electron theory, magnetism, electro-magnetism, sources of electricity, electrical units, impedance, AC circuits, commutation and rectification. Fulfills the power sources requirement in other programs. (3-3)

97 Appliance Service and Repair ..... 5 credit hours

Basic experiences with typical equipment found in the home or small business including washers, dryers, refrigerators, air conditioners, electrical appliances, and small utility type devices. Emphasis is placed on the replacement and installation of new components. (2-9)

100 Power Sources ..... 4 credit hours

Introductory Electricity 90 is equivalent course. Advisors may substitute appropriate courses when student's background and experience have been evaluated. (3-3)

110 Electrical Applications ..... 1 credit hour

Prerequisite: Electrical Fundamentals 111.

Sets of programmed laboratory experiences applying electrical theory and measurements. (Required of those students in the Electronic Engineering Technician and Test Technician programs.) (0-3)

111 Electrical Fundamentals ..... 3 credit hours

Prerequisite: High school math. Those students majoring in the Electronic Engineering Technician program must have previously completed the requirements of, or be simultaneously enrolled in, Algebra or Trigonometry. (Electronic Engineering and Test Technicians are to enroll in Electrical Applications 110 simultaneously.)

This course deals with the fundamentals of electricity through the study of electric current generation, measurement, and application. Magnetic phenomena, AC wave generation and measurement, alternating current transfer, time constants (circuit breakers; ignition), relays and regulators; an introduction to hydraulic control and refrigeration theory will be presented. The electrical instrumentation used will include: oscilloscopes; AC current, volt, and watt meters; tachometers; V.O.M.; and impedance bridge. (2-3)

120 Electrical Applications ..... 1 credit hour

Prerequisite: Electrical Fundamentals 111 and Electrical Application 110.

Co-requisite: Electrical Fundamentals 122.

A continuation of Electrical Applications 110. Required of those students in the Electronic Engineering Technician and Test Technician programs. (0-3)

122 Electrical Fundamentals ..... 3 credit hours

Prerequisite: Electrical Fundamentals 111, preceded or accompanied by Algebra and Trigonometry 140.

Alternating current generation, commutation, and rectification; exercises in the solutions of series, parallel, and complex circuits are presented. A study is made of relay sequencing and logic. Common motor starting and speed controls are covered. An introduction to solid state and vacuum tube diodes and triodes is included. (2-3)

127 Industrial Electricity ..... 4 credit hours

Prerequisite: Electrical Fundamentals 111, preceded or accompanied by Electrical Fundamentals 122.

The study and application of single and three phase transformers and motors, motor controls, switch boxes. Home and commercial wiring circuit diagrams and segments of the National Electric Code are studied. (3-3)

210 Audio and Intermediate Frequency Transmission ..... 3 credit hours

Prerequisite: Electrical Fundamentals 122.

A presentation of network theorems; series, parallel, and tuned resonance (IF) circuits; impedance transformation and matching; AC and DC coupling methods are included. (3-0)

211 Electronics ..... 4 credit hours

Prerequisite: Electrical Fundamentals 111 and 122, preceded or accompanied by Audio and Intermediate Transmission 210.

Application of transistor and vacuum tube theory and equivalent circuits; principles of amplifier circuits and applications; familiarization with electronic components and instrumentation are studied. (3-3)

222 Electronics ..... 4 credit hours

Prerequisite: Electronics 211.

This course deals with the theory and use of oscillators, detectors, amplitude, frequency, SSB and phase modulations, multiplexing and telemetering systems. It also provides specific information for those students interested in "Communications Electronics." (3-3)

237 Electronic Switching and Control (Logic) ..... 3 credit hours

Prerequisite: Introductory Electricity 90, Electrical Fundamentals 111, or consent of the instructor.

A presentation of the theory of electronic logic accompanied by problems using "AND" gates, "OR" gates, shift registers, time delays and counters; M.I.L.; and machine printed logic symbols are used. The binary number system and Boolean Algebra are applied. Magnetic storage theory systems is included. (2-2)

238 Industrial Electronics ..... 4 credit hours

Prerequisite: Electronics 211.

The study and use of silicon controlled rectifiers; special solid state devices, and gas filled tubes is covered. Industrial applications of electronics to such problems as light regulations, motor speed control, and welding are made. A study is made of printed circuitry, micro-module, flip chip, and other packaged circuits as well as JEDEC, NEMA, AND EIA standards. (3-3)

239 Circuits Testing, Repairs, and Debugging ..... 5 credit hours

Prerequisite: Preceded or accompanied by Electronics 222 and Industrial Electronics 238.

A study is made of circuits — including those used in radio and television. Sets are deliberately made inoperative by the teacher-counselor and then assigned to a student to "debug." Wiring schematics and service manuals are used. Each student is to design, lay out, fabricate, and wire a project agreed upon with the teacher-counselor. (2-9)

FLUID POWER

111 Hydraulic Fundamentals ..... 4 credit hours

Basic components of hydraulic systems, as well as a general understanding of the basic laws and formulas used in simple hydraulic calculations. Covers topics such as: pumps, control valves, control assemblies, actuators, ASA symbols and maintenance. Laboratory experiments with components and simple circuits are emphasized. (2-8)

122 Hydraulic Generators (Pumps) ..... 4 credit hours

Inclusive experience with a variety of different manufacturers' pumps, including piston, radial, gear, and combination pumps. Construction, care, and application to circuitry are emphasized. (2-8)

213 Hydraulic Controls ..... 3 credit hours

A course pertaining to pressure, volume, directional controls and control assemblies. Manual, solenoid and pilot directed controls as well as intensifiers and accumulators including some applications are stressed. (2-4)

214 Basic Hydraulic Circuits ..... 3 credit hours

The fundamentals, review of components, and necessary computations for basic hydraulic circuits are covered. Introduction to trouble shooting techniques in the hydraulic circuit are stressed including the importance of oil viscosity and line component malfunctions. (2-4)

225 Hydraulic Circuits ..... 3 credit hours

Study of the operation, application and maintenance of machine hydraulic circuits. Lathe, broach, mill and die casting machines are included. Modern implications for computer fluidics are introduced. (2-4)

226 Pneumatics ..... 3 credit hours

A study of basic air system components and circuits. Valves, compressors, inhibitors, refrigerants, and accumulators are covered. Air over oil circuitry and applications to fluidics are also studied. (2-4)

TRADE RELATED INSTRUCTION

Related instruction classes meet for one and one half hour sessions either once or twice a week. Terms are twelve weeks in length.

T.R.I.-001.1 Mathematics — Shop Arithmetic ..... 1 credit hour

Intensive review of basic arithmetic. Material reviewed includes fractions, decimals, percentage, ratio and proportion, taper problems, square root, and excess of nines checking system.

T.R.I.-002.1 Mathematics — Algebra ..... 1 credit hour

Prerequisite: T.R.I.-001.1.

This is essentially basic elementary algebra. The material covered includes the fundamental operations of positive and negative numbers, grouping symbols, algebraic axioms, equations, special products and factoring, solution of quadratic equations, and the solution of practical problems.

T.R.I.-003.1 Mathematics — Geometry ..... 1 credit hour

Prerequisite: T.R.I.-001.1.

This is an introductory course in geometry. The material covers the definitions and description of geometric terms, axioms, and theorems. An explanation is given to propositions dealing with straight lines, triangles, and circles, with applications to practical problems.

T.R.I.-004.1 Mathematics — Trigonometry I ..... 1 credit hour

Prerequisite: T.R.I.-003.1.

Covers definitions of the trigonometric functions, construction and use of trigonometric tables, interpolation, solution of right angle problems, and applications of trigonmetry to practical shop problems.

T.R.I.-005.2 Mathematics — Logarithms ..... 1 credit hour

Prerequisite: 004.1.

An elementary study of logarithms and their uses in the solution of problems involving multiplication, division, powers, roots, and the trigonmetric functions.

T.R.I.-006 Mathematics — Trigonometry II ..... 1 credit hour

Prerequisite: T.R.I.-004.1 and 005.2.

Solution of oblique triangle problems; use of cotangents, law of cosines, law of sines, and use of altitudes to form right triangles. Practice in solution of numerous shop problems by solving oblique triangles.

T.R.I.-007 Mathematics — Trigonometry III ..... 1 credit hour

Prerequisite: T.R.I.-006.

Practice in identification, classification, and solution of standardized types of trigonometric problems occurring in shop and drafting room.

T.R.I.-008 Mathematics — Compound Angles I ..... 1 credit hour

Prerequisite: T.R.I.-006.

Use of principles of trigonometry to determine plane and face angles in solid figures, classification of solid geometric figures into five basic types, analysis and recognition of types, demonstration and practice in solving shop problems.

T.R.I.-009 Mathematics — Compound Angles II ..... 1 credit hour

Prerequisite: T.R.I.-008.

Determination of angles of tilt and rotation for mounting parts on adjustable angle plates, methods of checking angular tapered dovetails, serrated taper gages and die sections.

T.R.I.-010 Mathematics — Gearing I ..... 1 credit hour

Prerequisite: T.R.I.-002.1.

Mathematics of standard screw threads; such as American National, United States V., Acme, and Worm, standard notations and formulas for spur gears, bevel gears, and bevel gear housings; solution of gear problems in which the given information is taken from design data. Charts, gear models, and gears are used as aids in visualizing the problems.

T.R.I.-011 Mathematics — Gearing II ..... 1 credit hour

Prerequisite: T.R.I.-010.

Standard notations and formulas for helical gears, practice in designing a set of helical gears, replacement of spur gears with helical gears, problems of gear trains, use of an idler gear, simple and differential indexing.

T.R.I.-022 Mathematics — Algebra, Geometry, and Slide Rule for Electrical and Allied Trades ..... 2 credit hours

Review of Algebra including: solution of equations, formulas, simultaneous linear equations and their graphs, quadratic equations. Geometry: Fundamental concepts and construction, angles and areas, perpendicular and parallel lines, parallelograms, circles, triangles. Slide Rule: application to multiplication, division, extraction of square root, proportion.

T.R.I.-023 Mathematics — Trigonometry, Vectors, and Slide Rule for Electrical and Allied Trades ..... 1 credit hour

Prerequisite: T.R.I.-022.

Trigonometry: measurement of angles, function of angles, solution of right triangles and oblique triangles. Vectors: construction of vectors, vector notation, solution of vectors by component and parallelogram methods. Slide Rule: application of trigonometric scales.

T.R.I.-033 Mathematics — Preparatory Algebra ..... 2 credit hours

Prerequisite: T.R.I.-002.1.

This course is preparatory to engineering algebra. It consists of a study of fundamental operations, signed numbers, literal expressions, products and factoring, fractions, equations, standard formulas, exponents, radicals, and square root.

T.R.I.-041.1 Strength of Materials I ..... 1 credit hour

Prerequisites: Algebra, Trigonometry 7, Physics.

An introductory course in strength of materials for those without a background in mechanics. Force systems, vectors, free body diagrams, statically determinate and statically indeterminate members, controids moments of inertia, friction, stress-strain relationships, resolved stresses, physical properties, fatigue stress, stress at elevated temperature, stresses caused by thermal change, and stresses due to combined loading and temperature are studied.

T.R.I.-041.2 Strength of Materials II ..... 1 credit hour

Prerequisite: T.R.I.-041.1.

Shear and bending moments, types of beams, vertical shear and bending moments, maximum shear, the design of beams, beams of varying section modules, Modulus of rupture in bending, effect of lateral buckling, determination of the radius of curvature of a beam, moment-area method, application of the moment-area method to beams with either concentrated or uniform loads and to statically indeterminate problems, and beams on three supports are studied.

T.R.I.-051.1 Mathematics — Engineering
Algebra I ..... 1 credit hour
Prerequisite: T.R.I.-033.

Linear equations, rectangular coordinates, graphic representation of equations, linear systems, practical problems, exponents, radicals and imaginary numbers.

T.R.I.-051.2 Mathematics—Engineering
Algebra II ..... 1 credit hour
Prerequisite: T.R.I.-051.1.

Quadratic equations; solutions of graphing, factoring, completing the square, and the quadratic formula. Solution of systems of equations. Radical equations, practical problems involving equations.

T.R.I.-051.3 Mathematics — Engineering
Algebra III ..... 1 credit hour
Prerequisite: T.R.I.-051.2.

Descartes' rule of signs, synthetic division solution of higher degree equations by Horner's Method, solution of mechanical design problems involving higher degree equations.

T.R.I.-051.4 Mathematics — Engineering
Algebra IV ..... 1 credit hour
Continuation of 051.3.

T.R.I.-101 Drafting — Blueprint Fundamentals ..... 1 credit hour

Introduction to blueprint reading. Class exercises in interpreting various kinds of lines, position of views, symbols, conventions, and standards found on blueprints.

T.R.I.-102 Drafting — Elementary Projection ..... 1 credit hour
Prerequisite: T.R.I.-101.

Use of drawing tools, simple geometric construction, fundamentals of orthographic projection, and simple dimensioning.

T.R.I.-103 Drafting—Mechanical Standards ..... 1 credit hour
Prerequisite: T.R.I.-102.

Simple shop drawing to illustrate methods of dimensioning, symbolizing, and sectioning of various kinds. Conventional practices of commercial drafting.

T.R.I.-104 Drafting — Visualization by Using
Clay Models ..... 1 credit hour
Prequisite: T.R.I.-102.

Practice in three dimensional visualization interpretation of simple two-view and three-view prints, and modeling clay into forms related to blueprints that cover fundamentals of shape interpretation.

T.R.I.-105 Drafting — Advanced Projection ..... 1 credit hour
Prerequisite: T.R.I.-103.

Drawings of auxiliary views, symmetrically opposite parts, representation of casting, analysis of title blocks and stock column.

T.R.I.-105.6 Drafting — Structural Drawing I ..... 1 credit hour
Prerequisite: T.R.I.-105.

Acquaintance with units of stress in the selection and drawing of uniformly loaded beams and connections through the use of the Steel Construction Manual. Includes the use of framed beams; beam and seated beam assemblies.

T.R.I.-106 Drafting — Machine Shop Blueprint Reading I ..... 1 credit hour
Prerequisite: T.R.I.-105.

Practice in reading blueprints involving dimensioning practices, conventions in line elimination and sectioning, auxiliaries symmetry and castings.

T.R.I.-106.6 Drafting — Structural Drawing II ..... 1 credit hour
Prerequisite: T.R.I.-105.6.

Continuation of 105.6. Selection and drawing of stiffened and unstiffened seated connections; rivets, columns and welded beam connections. Detailing of various structural members from an assembly drawing.

T.R.I.-107 Drafting — Elementary Pictorial Drawing ..... 1 credit hour
Prerequisite: T.R.I.-102.

Isometric and oblique freehand sketching and instrument drawings.

T.R.I.-108 Drafting — Detail and Assembly Drawings I ..... 1 credit hour
Prerequisite: T.R.I.-106.

Working and outline assembly drawings with special attention to drafting standards. Reading of toolroom detail and assembly prints to explain current methods.

T.R.I.-108.4 Drafting — Detail and Assembly Drawing (Die) ..... 1 credit hour
Prerequisite: T.R.I.-106 and 327.4.

Familiarization with working assembly and detail drawings of piercing, blanking and forming dies shown in pictorial drawings, listing of standard parts in stock columns, sectional views of assemblies, identification of drawings, and application of precision dimensions.

T.R.I.-109 Drafting and Assembly Drawings II ..... 1 credit hour

Prerequisite: T.R.I.-108.

Working and outline assembly drawings with special attention to drafting standards. Reading of toolroom detail and assembly prints to explain current methods.

T.R.I.-109.4 Drafting — Cutting Dies ..... 1 credit hour

Prerequisite: T.R.I.-108.4.

The development of basic designs of dies to pierce, blank, trim, and coin parts. Practice in blueprint reading of the above type of dies.

T.R.I.-110 Drafting — Elements of Tool Details ..... 1 credit hour

Prerequisite: T.R.I.-105.

Drawing and theory of cutting tools, gears, and cams.

T.R.I.-110.4 Drafting — Elements of Die Design III ..... 1 credit hour

Prerequisite: T.R.I.-109.4.

Design of dies for forming; design solid, single pad and double pad forming dies.

T.R.I.-111 Drafting — Elements of Tool and Fixture Design ..... 1 credit hour

Prerequisite: T.R.I.-109.

Design and drawing of drilling, boring, milling and grinding fixtures.

T.R.I.-111.4 Drafting — Elements of Die Design IV ..... 1 credit hour

Prerequisite: T.R.I.-110.4.

Design of compound, progressive, draw, transfer and multi-siled dies. Care is taken to familiarize the student with conventional and progressive operations, and the equipment used with dies doing this sort of work.

T.R.I.-111.6 Drafting — Gage Design ..... 1 credit hour

Prerequisite: T.R.I.-109 or 108.4.

Design of plug, ring, snap, feeler, flush pin, relation, indicator and form gages for production.

T.R.I.-122 Sheet Metal Drawing I ..... 1 credit hour

Prerequisite: T.R.I.-105.

Application of the parallel line method of sheet metal layout; the development of paper stretchouts and making of cardboard models of elbows and pipe joints. Related class discussion of types of material, stock sizes of materials, standard seams, riveting, and soldering.

T.R.I.-123 Sheet Metal Drawing II ..... 1 credit hour

Prerequisite: T.R.I.-122.

Development of cones and pyramids, their frustums and intersections by the radial line methods; the drawing of development layouts and the forming of cardboard models of same.

T.R.I.-124 Sheet Metal Drawing III ..... 1 credit hour

Prerequisite: T.R.I.-123.

Determination of the length by triangulation applied to developments of transition forms; practice in the layout of elbows and reductions; development of layouts for items selected from sheet metal standards.

T.R.I.-125 Sheet Metal Drawing IV ..... 1 credit hour

Prerequisite: T.R.I.-124.

Development of Y-branches. Practice in the drawing of the stretchout and making cardboard models of various types of Y's.

T.R.I.-126 Sheet Metal Drawing V ..... 1 credit hour

Prerequisite: T.R.I.-125.

This course provides experience in the development of the stretchout and the making of paper models of various types of elbows.

T.R.I.-127 Sheet Metal Drawing VI ..... 1 credit hour

Prerequisite: T.R.I.-126.

Layout of surfaces of square to round transitions, hoods, reduction elbows, and branches; application of short cut methods of layout.

T.R.I.-128 Sheet Metal Drawing VII ..... 1 credit hour

Prerequisite: T.R.I.-127.

Practical problems in laying out ducts, guards, ventilators, and transition pieces. The development of stretchouts and cardboard models provides practice in applying instruction of previous courses to company problems.

T.R.I.-129 Sheet Metal Drawing VIII ..... 1 credit hour

Prerequisite: T.R.I.-128.

A course in sheet metal drawing and development based on projects adapted from a company sheet metal standards book. The term's work is grouped around three major projects for which drawings, developments models and stock bills are made.

T.R.I.-151.1 Machine Design —
Descriptive Geometry I ..... 1 credit hour

Prerequisite: T.R.I.-102, 105, 107.

A review of the fundamentals of three-view projection auxiliary views and oblique views, based on Hood's coordinate system of plotting points.

T.R.I.-151.2 Machine Design —
Descriptive Geometry II ..... 1 credit hour

Prerequisite: T.R.I.-151.1.

Planes and their relationship to points, lines, and other planes, angles between planes, and intersections of planes.

T.R.I.-151.3 Machine Design —
Descriptive Geometry III ..... 1 credit hour

Prerequisite: T.R.I.-151.2.

Planes and their relationship to lines and points; angles between lines, planes, and intersections.

T.R.I.-151.4 Machine Design —
Descriptive Geometry IV ..... 1 credit hour

Prerequisite: T.R.I.-151.3.

Advanced construction of various intersecting solids and surface developments of cones, cylinders, prisms, pyramids and transition pieces.

T.R.I.-201 Electricity — D.C. Systems and
Circuits, Conductors and Batteries ..... 2 credit hours

Prerequisite: T.R.I.-022.

Static electricity; Ohm's Law; series, parallel, and combination circuits; circuit measurements; diagnosis of circuit faults; 2-wire systems and line drop; electric power, power loss, equivalent of heat, efficiency of power transmission and utilization; electrical properties of conductors; resistability, effect of temperature and temperature co-efficients; copper-wire tables and gages; current carrying capacities of wires; determination of circuit wire size; application of Kirchoff's Law to two- and three-wire systems and bridge circuits; structure, operation, use and care of electric cells and batteries; electroplating.

T.R.I.-201.4 Electricity — Direct Current
(Non-Mathematical) ..... 1 credit hour

Static electricity; Ohm's Law; series and parallel circuits; meters and circuit measurements; circuit faults; conductors; effect of temperature; two- and three-wire systems and line drop; power and power loss; cells and batteries; magnetism; electromagnets; inductance; D.C. generators, motors, and control circuits.

T.R.I.-202 Electricity — Magnetism, Inductance, D.C. Instruments, Armature Windings, and Capacitance ..... 2 credit hours
Prerequisite: T.R.I.-201.

Magne's and magnetism; electromagnets and applications; Ohm's Law for magnetic circuits; permeability; magnetization curves; series and parallel magnetic circuits; hysteresis; inductors and self and mutual inductance; non-inductive windings; construction, operation use, and care of D.C. galvanometers, ammeters and shunts, voltmeters and multipliers, and wattmeters; armature structure; lap and wave armature windings; armature testing; insulators and dielectrics; capacitors and capacitance.

T.R.I.-203 Electricity — D.C. Generators and Motors ..... 1 credit hour
Prerequisite: T.R.I.-202.

Generator: construction, induced emf, commutator and direct current, windings and brush voltage, armature resistance, commutation, field excitation, armature reaction, regulation and control; excitation, characteristic curves, regulation, voltage control, degree of compounding as each applies to self-excited, series, shunt, and compound, generators; compensating windings; parallel operation of shunt and compound generators. Motor: torque, horsepower, counter emf, action under load, armature reaction; running performance, speed-load and speed-torque characteristics, regulation, speed control, and applications as each applies to shunt, series, and compound motors; commutating poles; efficiency and losses in motors and generators.

T.R.I.-204 Electricity — D.C. Motor Controls ..... 2 credit hours
Prerequisite: T.R.I.-203.

J. I. C. symbols and diagram specifications; kinds of and operation of magnetic contractors or relays; Overload relays; limit switches; field-loss and field-accelerating relays; magnetic starters of the counter emf, current limit, and definite time types; magnetic brakes; dynamic braking, plugging, and regenerative braking; Ward-Leonard system for variable speed control; typical crane control circuits; circuit tracing; testing and maintenance of control circuits.

T.R.I.-205 Electricity — A.C. Single-Phase Systems and Circuits ..... 2 credit hours
Prerequisite: T.R.I.-023 and 202.

The generation of a single-phase, alternating voltage and current; alternating voltage and current; the single curve; instanteous, average, and effective values; frequency; phase relationship between individual voltage and/or currents; graphic and vector representations; power; power factors; power factor correction; inductive and capacitive reactance, impedance in series and parallel circuits; resonance in series and parallel circuits; combination circuits.

T.R.I.-205.4 Electricity — Alternating Current (Non-Mathematical) ..... 1 credit hour

Prerequisite: T.R.I.-201.4.

The generation of alternating voltage and current; the sine curve; instantaneous, average, and effective values; frequency; phase relationships; power; power factor; inductance and capacitive reactance; impedance; polyphase circuits; alternators; transformers; induction motors; single-phase motors; and control circuits.

T.R.I.-206 Electricity — A.C. Polyphase Systems and Circuits, Alternators, and Transformers ..... 1 credit hour

Prerequisite: T.R.I.-205.

Voltage, current, power, and power factor in polyphase systems and circuits; alternator construction, windings, performance, operation, rating; parallel operation of alternators, synchronization, hunting; transformer action, construction, rating; phasing-polarity and parallel operation of transformers; induction regulator; constant-current and instrument transformers.

T.R.I.-207 Electricity — A.C. Motor and Stator Windings ..... 2 credit hours

Prerequisite: T.R.I.-206.

A study of the construction, theory of operation, operating characteristics, and industrial application of synchronous and induction motors; single phase motors, high frequency and multi-speed motors, and single line stator winding diagrams.

T.R.I.-208 Electricity — A.C. Controllers ..... 2 credit hours

Prerequisite: T.R.I.-207.

A study of manual and push-button controllers for starting induction and synchronous motors across-the-line; reversing, resistance, compensator, high voltage, multi-speed, and high torque methods; overload relays; friction and dynamic brakes; plugging relays; circuit breakers; and time-delay relays.

T.R.I.-209 Electricity — Instruments and Illumination ..... 2 credit hours

Prerequisite: T.R.I.-206.

A study of the principles of operation, connection and application of the following types of instruments, relays, and associated equipment: Voltmeters; ammeters; power and energy measuring meters; power factor meters; synchroscopes; frequency meters; resistance and capacitance measuring instruments; current, power, differential, and impedance relays; instrument transformers; reactors; lightning arrestors; and self-synchronous systems. Also covered are fundamentals of illumination, incandescent and fluorescent lighting systems; and methods of calculating lighting installations.

T.R.I.-210 Electricity — National Electric Code ..... 2 credit hours
Prerequisite: T.R.I.-205.

A study of the national and local electric codes for wiring and apparatus. It covers wiring design and protection, wiring methods, and materials, equipment for general use including motors and controllers, special occupancies such as hazardous locations, special equipment including electric welding and machine-tool wiring, and the use of tables and diagrams for the solution of practical wiring problems.

T.R.I.-211 Electricity — Electronics ..... 2 credit hours
Prerequisite: T.R.I.-205.

A study of vacuum and gas-filled tube characteristics, tube and disc-type rectifiers, amplifier and oscillator circuits, phase-shift controls, trouble shooting, light sensitive tubes and circuits, electronic precipitators, high frequency heating systems, electronic safety devices, recorders and controls for furnaces, electronic controllers for motors, and miscellaneous industrial electronic circuits.

T.R.I.-212 Electricity — Welding Controls ..... 2 credit hours
Prerequisite: T.R.I.-211.

A study of D.C. and A.C. Welding circuits, automatic arc welding systems, butt welding, sequence controls for spot welding, heat controls, seam welding controls, synchronous welding timers, and servicing techniques of welding controllers.

T.R.I.-213 Electricity — Electrical and
Hydraulic Circuits ..... 1 credit hour
Prerequisite: T.R.I.-401, 205, or 205.4.

A review of symbols for electrical circuits and hydraulic diagrams; a discussion of the merits of components of electrical circuits; explanation of hookups for various types of hydraulically actuated machines; troubleshooting techniques.

T.R.I.-214 Electricity — Controller Applications ..... 2 credit hours
Prerequisite: T.R.I.-211.

Review of D.C. Motors, fundamentals of block diagrams for electronic controllers, variable speed drivers, dynamometer controls for inductor type dynamometers and D.C. dynamometers. Variable speed press controls.

T.R.I.-246 Electricity — Electrical Tools
and Equipment ..... 1 credit hour

The purpose of this course is to familiarize the beginning electrical apprentice with types, sizes and designations of electrical tools and equipment. The material covered is as follows: fundamentals of electricity and hydraulics; hand tools; taps; screws; bolts; types of conductors; wiring connections; splices; rigid conduit; fittings; wiring systems; switches; starter; motors; lighting equipment; safety rules.

T.R.I.-248 Plumbing and Pipefitting — Fundamentals ..... 1 credit hour

A study of the specifications, applications, installations and maintenance of the various kinds of pipes, fittings, valves, pumps, and hand tools used in the pipefitting trade.

T.R.I.-262 Welding — Acetylene Welding I ..... 1 credit hour

A study of oxygen and acetylene; the oxy-acetlyene flame; equipment; setup and operation; safety precautions; metal properties important to welding; preliminaries to welding; expansion and contraction of metals; the constitution of ferrous alloys; the application of oxy-acetylene flame.

T.R.I.-264 Welding — Arc Welding I ..... 1 credit hour

This is an introductory course in arc welding covering welding theory and practice; D.C. arc welding; arc welding supplies; general procedure in arc welding; methods of welding in different positions; A.C. welding; inspection and testing of welds; non-ferrous and cast-iron welding; special ferrous welding; inert arc welding; submerged arc welding; and electrode classification.

T.R.I.-301 Shop Theory — Metal Working Trades I ..... 1 credit hour

Emphasis on non-precision, semi-precision and precision tools. Reading and proper use of precision measuring tools and instruments, including micrometers, vernier height gages, vernier bevel protractors, dial indicators, amplifiers, and comparators. Review of formulas and tables. Safety in operations at the bench is stressed.

T.R.I.-301.6 Millwright Theory and Equipment ..... 1 credit hour

Study of fiber and wire rope, tackle block and sling chains, and their use in the moving and installation of machinery. Belt, chain and sprocket drives, spur, bevel, helical and worm gearing are also covered.

T.R.I.-302 Shop Theory — Metal Working Trades II ..... 1 credit hour

Prerequisite: T.R.I.-301.

This course emphasizes nomenclature, work operations, and safety involved in the use of common tool room machine tools, including the chaper, planer, lathe, bullards, and screw machines. Also comprehensive coverage of the proper tool grinding, work setups, selections of correct speeds and feeds; operations; overcoming work difficulties and dimensional control related to the use of the above machine tools.

T.R.I.-302.6 Millwright Theory and Equipment II ..... 1 credit hour

Prerequisite: T.R.I.-301.6.

Study of conveyors, including trolleys, tracks, and supports, hangers, bends, drives, overloads, devices, take-up carriers, guards and run away stops. Principles of design, instrumental to the servicing of conveyor systems.

T.R.I.-326 Shop Theory — Metal Working Trades III ..... 1 credit hour

Prerequisite: T.R.I.-302.

This course covers the milling, O.D. grinder, centerless grinder, surface grinder, I.D. grinder and cutter grinders as toolroom machine tools. It includes nomenclature, proper tool selection and setting, work setups, selection of correct feeds and speeds, operations, overcoming work difficulties, and dimensional control.

T.R.I.-327 Shop Theory — Metal Working Trades IV ..... 1 credit hour

Prerequisite: Shop Experience. One hour credit.

This course is one planned to give a survey of the newest developments in the areas of the metal cutting trades. It includes principles of ultrasonic machines, electrical discharge machines, chemical milling, electrochemical machining, recent advances in cutting tool materials, the advantages of plastic tooling, an introduction of numerical control for machine tools.

T.R.I.-327.4 Die Theory ..... 1 credit hour

Prerequisite: T.R.I.-326.

This course is a study of the theory of press metal working operation for piercing, blanking, trimming, drawing and forming dies. The study of the types of presses and the use of die plasters are also included. This course is a prerequisite to the die drawing courses.

T.R.I.-401 Hydraulics — Hydraulics Fundamentals ..... 1 credit hour

Prerequisite: T.R.I.-002.1.

This course is arranged to give the student a general knowledge of the basic components of hydraulic systems, as well as a general understanding of the basic laws and formulas used in simple hydraulic calculations. Covers such topics as: pumps, control valves, control assemblies, actuators, the use of the J.I.C. standard hydraulic symbols, and maintenance procedures.

T.R.I.-402 Hydraulics — Hydraulic Pumps I ..... 1 credit hour

Prerequisite: T.R.I.-401.

Construction, operation, and care of constant volume pumps of all types and makes are studied.

T.R.I.-405 Hydraulics — Hydraulic Pressure Control Valves ..... 1 credit hour

Prerequisite: T.R.I.-401.

A course pertaining to pressure-operated hydraulic devices and hydraulic pressure control devices. The lesson topics are pressure theory, relief valves, pressure reducing valves, intensifiers, accumulators, sequence valves, unloading valves, counterbalance valves, pressure switches, combination pressure controls, and pressure measurement devices.

T.R.I.-406 Hydraulics — Hydraulic Volume Controls ..... 1 credit hours

Prerequisite: T.R.I.-401.

Operation, circuit application and adjustments of hydraulic flow control valves, flow control and check valves; problem solving; and trouble shooting.

T.R.I.-407 Hydraulics — Hydraulic Directional Controls ..... 1 credit hour

Prerequisite: T.R.I.-401.

This course is intended to give the student information concerning the construction, operation and servicing of hydraulic devices controlling the direction of flow of hydraulic fluids. The devices studied are as follows: check valves, rapid traverse and check valves, rotary pilot valves, plunger type pilot valves, special pilot valve assemblies, manually and mechanically operated four-way valves, and solenoid controlled and pilot operated four-way valves.

T.R.I.-409 Hydraulics — Basic Hydraulic Circuits ..... 1 credit hour

Prerequisite: T.R.I.-401.

This course includes a brief treatment of hydraulic circuit fundamentals and calculations. Primary consideration, however, is given to hydraulic circuits for presses, broaches, welders, riveters, lathes, drilling machines, milling machines, and grinders. Attention is also given to typical pilot-operated circuits, and trouble-shooting techniques for hydraulic systems. A more detailed treatment of hydraulic circuits for these machines is given in later courses.

T.R.I.-501 Characteristics of Metals ..... 1 credit hour

The nature and behavior of metals. Crystalline structure, theory of alloys, principles of heat treatment. Properties of metals and alloys and the testing thereof.

T.R.I.-502 Metal Processing I ..... 1 credit hour

Prerequisite: T.R.I.-501.

Mining, milling, smelting and refining of metallic ores. Fabrication processes, including casting, hot and cold forming, machining, welding, powdered metallurgy and electroplating.

T.R.I.-503 Metal Processing II ..... 1 credit hour

Prerequisite: T.R.I.-501.

Specific properties, applications and design features of various engineering materials including ferrous and non-ferrous metals, special alloys and plastics.

T.R.I.-504 Heat Treatment of Metals ..... 1 credit hour

Prerequisite: T.R.I.-501.

Properties, applications and heat treatment of tool and die steels including water hardening, oil hardening, hot work, shock resisting and hi-speed steels. Nature and applications of selected surface finishing processes such as polishing, tumbling, hot-dip and electroplating.

T.R.I.-541 Physics — Elementary Physics I ..... 1 credit hour

Prerequisite: T.R.I.-002.1 and 004.1.

A study of matter and measurements; molecular kinetics; Archimedes' principles and its application; liquid pressure; atmosphere; concurrent and parallel forces; motion and Newton's Laws; and simple machines

T.R.I.-542 Physics — Elementary Physics II ..... 1 credit hour

Prerequisite: T.R.I.-002.1 and 004.1.

A study of the laws and principles of elementary thermodynamics; propagation and refraction of light; sound and acoustics; and principles of electricity and magnetism.

T.R.I.-721 Job Processes and Plant Layout ..... 2 credit hours

Prerequisite: T.R.I.-101.

A course to familiarize the apprentice with the problems of plant layout. The work of the production engineer is considered as the source of information utilized by the draftsman in making a layout of equipment. Practice is provided in drawing simple job layouts.

COLLEGE ADMINISTRATION

Administrative Staff

David H. Ponitz ..... President

A.B.—The University of Michigan
M.A.—The University of Michigan
Ed.D.—Harvard University

Leland B. Luchsinger ..... Executive Assistant

B.S.—Texas Agriculture & Mechanical University
M.S.—Texas Agriculture & Mechanical University
Ed.D.—The University of Texas

Paul R. Hunt ..... Dean, Occupational Studies

B.S.—Wayne State University
M.A.—Wayne State University
Ed.D.—Wayne State University

Norman C. Olmsted ..... Dean, General Studies

A.B.—The University of Michigan
M.A.—The University of Michigan

David S. Pollock ..... Dean, Student Personnel Services

A.B.—The University of Michigan

Lloyd H. VanBuskirk ..... Business Manager

Graduate—General Motors Institute
B.S.—Eastern Michigan University
M.A.—Eastern Michigan University

DIVISIONAL DIRECTORS

William Cherniak ..... Communication Arts
B.A.—University of Western Ontario
A.M.—The University of Michigan

Paul W. Davis ..... Hospitality and Community Service Occupations
B.S.—Ball State Teacher's College
Ed.M.—Rochester Institute of Technology

Andrew F. Ford ..... Technical and Industrial
B.S.—Wayne State University
M.Ed.—Wayne State University

Arthur J. Lamminen ..... Business and Industrial Management
B.S.—Tri-State College
M.A.—Michigan State University

Richard H. Mallory ..... Auxiliary Services
B.S.—University of Detroit

Donald S. McEwen ..... Counseling
B.B.A.—The University of Michigan
M.A.—The University of Michigan

William Pittman ..... Buildings and Grounds
University of Wisconsin
Michigan State University

Mehran Thomson, Jr. ..... Exact Sciences
B.A.—Eastern Michigan University
M.B.S.—University of Colorado

John P. Wooden ..... Social Sciences
B.S.—Winona State College
M.A.—New Mexico State University

Douglas R. Woolley ..... Registrar
B.A.—Michigan State University

Harold C. Young ..... Learning Materials Center
A.B.—Boston University
A.M.L.S.—The University of Michigan
M.B.A.—The University of Michigan

COLLEGE FACULTY

Instructional Staff

Full-Time Faculty

Alexander, W. E. ..... Biology
B.S.—Hampton Institute
M.S.—University of Wisconsin
M.A.—The University of Michigan

Amaru, Augustine ..... Political Science
B.A.—Boston University
M.A.—Michigan State University

Barron, Kenneth E. ..... Automotive Service
B.S.—Central Michigan University

Belknap, Charles L. ..... Mathematics
B.S.E.—The University of Michigan
M.S.—The University of Michigan

Belkola, F. E. ..... Auto Body Repair and Painting
Fisher Body School

Bertoia, Roger R. ..... Industrial Drafting
B.S.—The University of Michigan
M.S.—The University of Michigan

Bottorff, Ralph ..... Mathematics
B.A.—State College of Iowa
M.A.—University of Illinois

Bylsma, Donald, Jr. ..... Sociology
B.S.—Wayne State University
M.A.—Wayne State University

Byrd, David Robert ..... Architectural Drafting
Graduate—Hampton Institute Trade School
Registered Architect, District of Columbia

Charlton, Eleanor S. ..... Secretarial Science and General Business
B.S.—Central Michigan University
M.A.—Central Michigan University

Cregar, James M. ..... Economics
A.B.—Indiana University
M.A.—Western Reserve University

Croake, Edith M. ..... English
B.A.—The University of Michigan
M.A.T.—Northwestern University
M.A.—Northwestern University

Davenport, James M ..... Educational Media Specialist
B.A.—Ohio Northern University

Elliott, William Douglas ..... English
B.A.—Miami University
M.F.A.—University of Iowa
M.A. and Ed.D.—The University of Michigan

Glusac, Ivan C. ..... Geography
B.A.—Wayne State University
M.A.—The University of Michigan

Gray, Daniel ..... Welding and Fabrication
Journeyman Pipe Fitter and Boilermaker
Air Force Technical School
Certified Welder—Navy, Air Force, Army

Griswold, George H. ..... Chemistry
B.A.—College of Wooster
M.S.—Eastern Michigan University

Hentz, Gary R. ..... Counselor
B.S.—Eastern Michigan University
M.A.—Eastern Michigan University

Hower, Guy W. ..... Counselor
B.B.A.—The University of Michigan
M.A.—The University of Michigan

Jackson, Robert L. ..... Trade-Related Instruction
Journeyman—Tool and Die and Diecast Die Maker
Henry Ford Community College
Tool and Processing Engineer

Jones, James A. ..... Psychology
B.A.—Southern Illinois University
M.S.—Southern Illinois University

Keck, Donald J. ..... History
B.A.—University of Buffalo
Ed.M.—University of Buffalo

Kokkales, Paul ..... Accounting, Business and Management
B.S.—Eastern Michigan University
M.A.—The University of Michigan

McBroom, Alan ..... General Business, Management and Marketing
B.S.—Eastern Michigan University
M.Ed.—Wayne State University

McClatchey, Merrill ..... Speech
B.A.—Wayne State University
M.A.—Columbia University

McGill, John B. ..... Physics
B.S.—Eastern Michigan University

Mealing, Percy ..... Mathematics and Physics
B.A.—Talladega College
M.A.—The University of Michigan

Mealing, Robert C. ..... Mechanical Technology
Journeyman, Industrial Machinist—Machine Repairman
Ford Motor Company Apprenticeship School
B.S.—Wayne State University

Nagel, Rosemarie ..... English
A.B.—The University of Michigan
M.A.—The University of Michigan

Nelson, Robert ..... X-Ray Technology
Alexian Brothers Hospital
School of Radiologic Technology
R.T.—The American Registry of Radiologic Technologists

Niehaus, Paul J. ..... Biology
B.A.—Eastern Michigan University
M.S.—The University of Michigan

Nowland, Richard ..... Counselor
B.S.—Eastern Michigan University
M.A.—The University of Michigan

Peters, Dianne S. ..... English
A.B.—University of Massachusetts
M.A.—University of Pennsylvania

Radick, Lawrence J. ..... Foreign Languages
B.A.—Michigan State University
M.A.—Michigan State University

Reddick, Bella G. ..... Secretarial Science and General Business
B.A.—St. Augustine's College
M.A.—The University of Michigan

Reps, Flavia P. ..... History
B.A.—St. Joseph College
M.A.—Georgetown University

Ross, Donald L. ..... Mathematics
B.S.—Eastern Michigan University
M.A.—The University of Michigan
M.A.T.M.—University of Detroit

Russell, Dean A. ..... Electricity-Electronics
B.S.—Eastern Michigan University
M.A.—Eastern Michigan University

Welch, Bruce H. ..... Automotive Service
B.S.—Central Michigan University
M.A.—The University of Michigan

Wheeler, Kenneth L. ..... Electricity-Electronics
F.C.C. Commercial License
The Radio Electronics Television School
B.S.E.E.—Detroit Institute of Technology

Wolven, Frederick F. ..... English-Journalism
A.B.—Central Michigan University
M.A.—Central Michigan University

PART-TIME FACULTY

Anthony, Mel ..... Counselor
B.A.—The University of Michigan
M.A.—The University of Michigan

Jones, Lola M. ..... Counselor
A.B.—Wayne State University
M.S.W.—The University of Michigan

Lawrence, Morris J., Jr. ..... Music
B.S.—Xavier University
M.M.—The University of Michigan

McClatchey, Janka ..... Art
B.A.—Wayne State University

Miller, John H. ..... Student Activities
B.B.A.—Washburn University

Perigo, William J. ..... Basketball
B.S.—Western Michigan University

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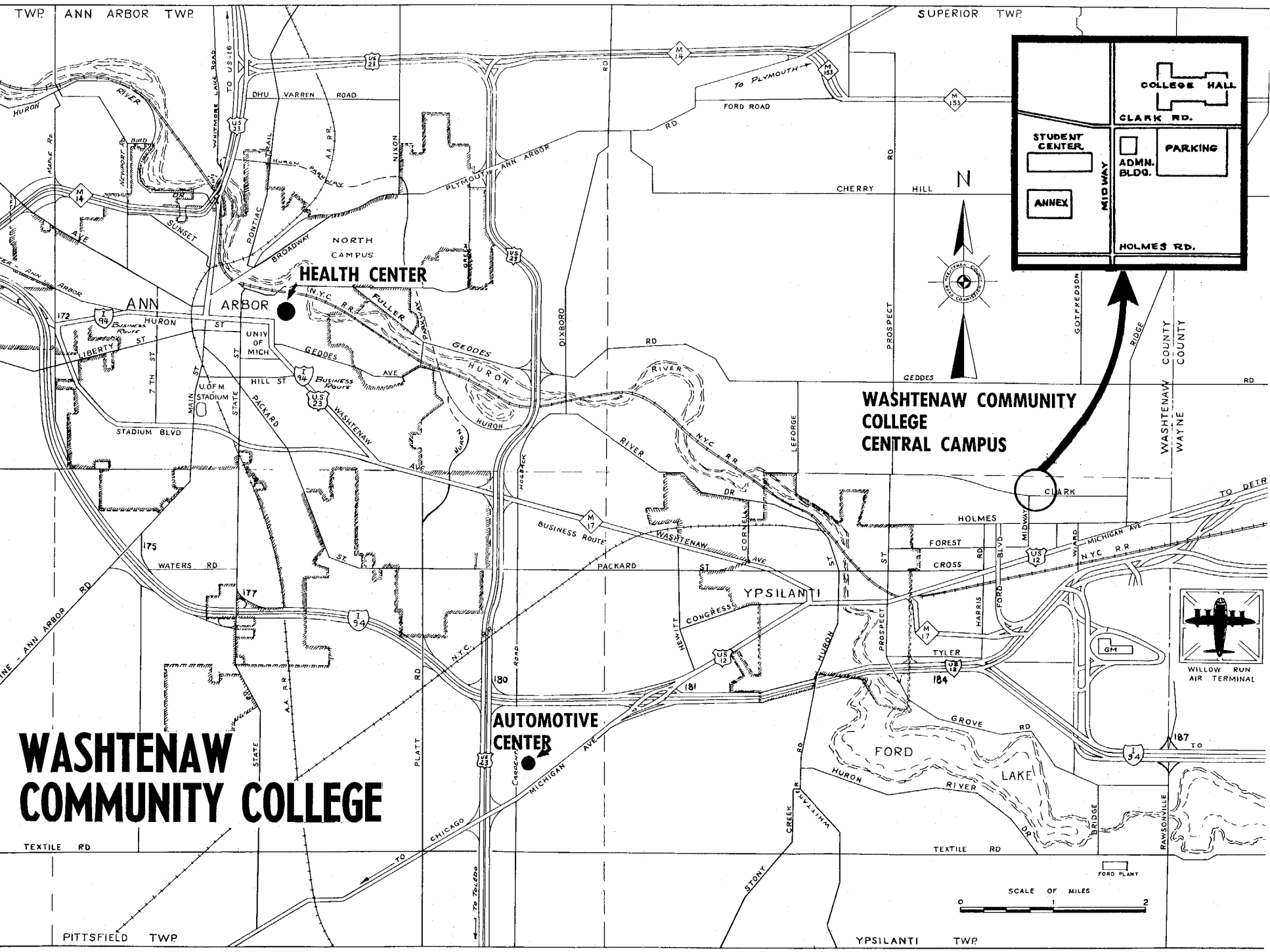
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