PITT INDUSTRIAL EDUCATION CENTER

Highway 11, South
GREENVILLE, N. C.

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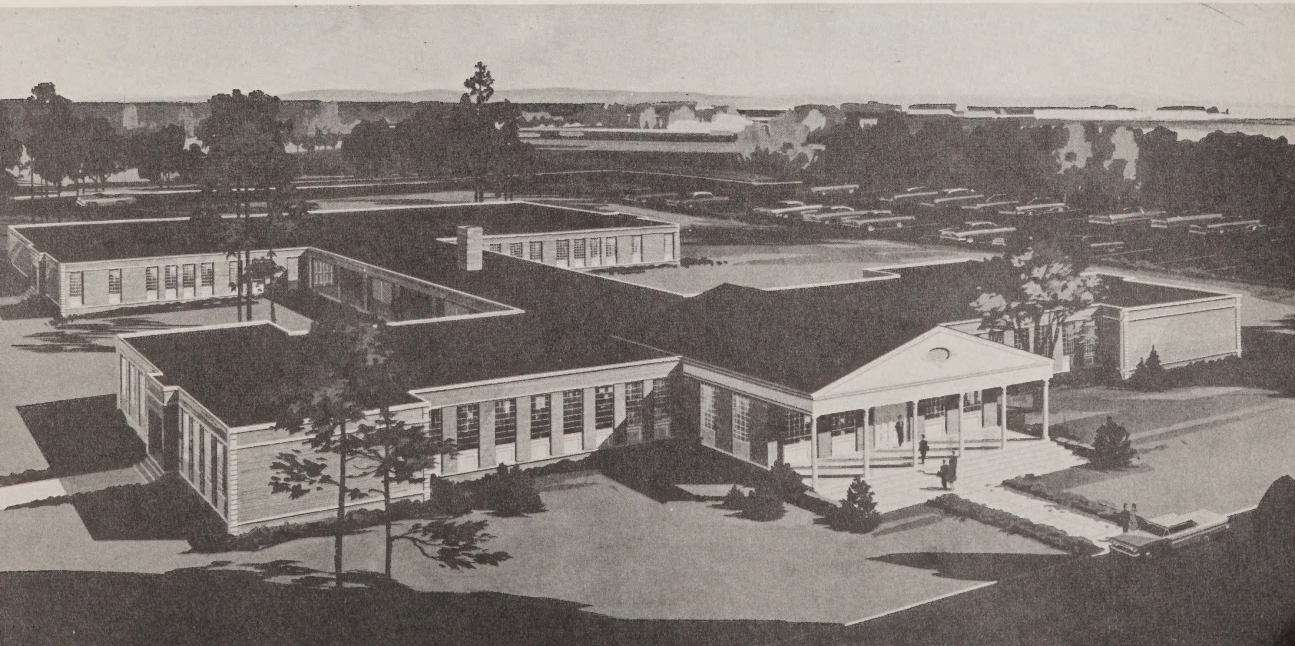

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PITT INDUSTRIAL EDUCATION CENTER

Greenville, North Carolina

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OBJECTIVES

It has been said that technical education is knowledge in action. Objectives of the Pitt Industrial Education Center embody the belief that the most meaningful knowledge is that which can be put to productive use.

Our objectives are envisioned as specific goals established to enlarge the potential of the individual student through education in the knowledge, skills, and attitudes which will be useful to him and thus to his employer. The Center will provide instruction in numerous special fields to meet the demands of an industrial community, but it will not ignore its responsibility to equip students with the ability to think creatively and abstractly. In addition, certain courses which place emphasis on an understanding of the American free enterprise system and develop interest in the betterment of mankind are common to all areas of study.

Our aims reflect a firm philosophy that education should equip every individual, insofar as his capacity permits, with the competence to attain his economic, social, intellectual, and spiritual goals in a democratic society. Physical and mental skills will be developed to the end that each student, as he trains and works in the various occupations, will be able to contribute to the maintenance, improvement, and defense of our American way of life.

GENERAL INFORMATION

The rapid growth of manufacturing in North Carolina is creating new employment opportunities for technically-trained personnel. The State's rich potential of human and natural resources has been recognized and industry has taken its place alongside the State's agricultural economy.

In order to meet the anticipated demand for skilled workers in this area, the Pitt Industrial Education Center was originally established by the cooperative efforts of the State Department of Trade and Industrial Education, the school system, and citizens of Pitt County.

Under legislation enacted in 1963, Administration of the Industrial Education Centers was transferred to the State Board of Education, Department of Community Colleges. Local control is vested in a Board of Trustees.

Industrial Education deals in skills and intellectual developments which complement general education. The purpose of the Center is, therefore, to provide technician, trade preparatory; market and management; trade up-grading training; mid-management development training; general adult education; and to develop those skills, technical knowledge, and occupation information necessary for useful and productive employment.

The instruction is available to both adults and out-of-school youth who have completed those courses that are prerequisite to the type of instruction desired.

LOCATION AND FACILITIES

The Pitt Industrial Education Center is located on Highway No. 11, South of Greenville, North Carolina. As one drives south from Greenville, on Highway No. 11, the Center is located three miles from Greenville, just off to the right of the Highway.

The administration, classrooms and laboratories contain over 35,000 square feet of space. The building is modern, well-lighted, and will, in the future, be air conditioned. Living facilities and restaurants are available near by.

THE "OPEN DOOR" ADMISSION POLICY

The Industrial Education Center has an "open door" admission policy. This means that any student, whether a high school graduate, drop-out, or adult, who may need formal educational opportunity, can be served by the institution. Students will be screened inside the institution to place them in the types of programs fitted for them, according to their abilities, and their objectives in life.

The "open door" policy does not eliminate the restrictions on admission to specified programs. It does mean that these restrictions will be flexible enough under careful guidance to allow a student every reasonable opportunity to prove himself, under good teaching. A student will be afforded the opportunity to eliminate admission requirement deficiencies through remedial work, and may remain in the program as long as he makes satisfactory progress. As soon as a student can meet the specified admission requirements, he may be enrolled in a curriculum.

While the institution will have an "open door" admission policy, it will also have a rather high level of exit, since there will be no compromise with the standards which require that the courses taught be maintained at a high level of excellence. Students who graduate as technicians, or craftsmen, must be fully prepared to carry the responsibilities that this training is supposed to prepare them to carry.

REGULATIONS FOR ADULT VOCATIONAL STUDENT LOAN FUND

The State Board of Education at its meeting on October 3, 1963, adopted regulations for operation of a loan fund for students in vocational and technical education. This fund began with a gift by the North Carolina Consumer Finance Association, from member loan companies, and was accepted by the State Board of Education.

Recipients of student loans may be granted financial assistance of not more than $300.00 per school year, under regulations adopted October 3, by the Board of Education. The number of loans will be determined by the demand and the availability of funds.

The Board said, "The purpose of the Fund is to provide for financial assistance to those students enrolled full-time, in vocational and technical education programs of an Industrial Education Center, Technical Institute, or Community College."

REGULATIONS

Main provisions in the loan fund regulations include the following: The Industrial Education Center shall furnish each applicant a copy of regulations and assure that he understands them, and shall make and collect the loans under procedures described in the regulations. The Center will establish a committee responsible for selecting candidates to receive the loans.

The loan regulations further state, "Each candidate for a loan must: (A) Be a resident of North Carolina and is, or expects to be, a full-time student of the approved institution as defined by the State Department of Community Colleges; (B) Declare that he is in need of financial aid to continue his studies as evidenced by information on furnished forms; (C) Apply on forms provided by the State Department of Community Colleges at the appropriate time; (d) Be approved by the institution student loan committee; (E) Use the proceeds of the loan only for the payment of tuition and required fees, institutional equipment, materials, and books, board and room, and similar living expenses .....

"Additional regulations essential to the administration of the Student Loan Fund may be developed in the discretion of the State Director of the Department of Community Colleges and the approval of the State Board of Education."

DELAYED INTEREST

No interest will be charged as long as the student continues attending the institution and maintains a satisfactory record in his studies, or during the first year after successful completion of his course. The interest rate is 3-1/2 per cent each year thereafter, with a maximum of six years after initial payment for full repayment. The regulations state, "In the event of unsatisfactory progress or permanent withdrawal from the institution, the entire indebtedness shall become due and payable, with interest commencing on that date."

ADMISSION PROCEDURE FOR GENERAL STUDENTS

Post high school youths and adults will submit a completed Application form to the office of the Pitt Industrial Education Center.

A Referral slip will then be given each applicant whereby he is authorized to request the General Aptitude Test, at the office of the North Carolina Employment Security Commission. For specific courses, additional selected tests may be required by the Director.

After passing the required aptitude tests, plus an interview with the Guidance Counselor at the Center, the successful applicant will be notified by mail of his acceptance, and also the date he is to register for class.

High School students in the cooperative program will be registered through their high school principal, or counselor, in cooperation with the Center personnel.

ENROLLMENT OF ADULT STUDENTS

Under a policy adopted by the State Board of Education, an adult student is defined as a person who has attained age twenty-one, who withdrew from high school prior to graduation, or a person with special needs.

SPECIAL NEEDS

A person with special needs is defined as a public school drop-out who is not yet twenty-one years of age, but whose educational needs cannot be met properly in the public school program.

Registration will be closed after a class has been in operation for five (5) sessions.

ATTENDANCE REQUIREMENTS

Only excused absences will be permitted. Unexcused absences will be entered as "0" for the daily work. Three consecutive unexcused absences will subject a student to dismissal. An accumulation of unexcused absences will also subject the student to dismissal.

Some evidence as to cause of absence will be required for excused absence.

WITHDRAWALS AND RE-ENTRANCE

1. A student's training may be interrupted for two consecutive unsatisfactory grades in any course. Students dismissed for this reason may apply for admission to re-enter the Center at the beginning of the next quarter. A record of the student's progress is maintained at the Center.

2. A student may withdraw from training at the end of any quarter due to illness or in special hardship cases, and re-enter at the beginning of the next identical quarter, provided the work done in the previous quarter was of passing grade.

3. Re-entrance will be permitted only when the student requests of the Director, or the Associate Director, a personal interview and, in the event his application is subsequently approved, he may be reinstated.

CURRICULUM STUDENTS

Registration Fees

Each student enrolled full-time or part-time in an approved curriculum of one or two years in length shall be charged an annual registration fee of $2.00 at the initial registration following July 1 of each year. No portion of the registration fee will be refunded.

Instructional Supply Fee

Each student enrolled full-time or part-time in an approved curriculum of one or two years in length shall be charged an instructional supply fee of $2.00 per quarter for each credit hour for which the student is enrolled; provided, the maximum charge shall be $30.00 per quarter.

EXTENSION CLASSES

Extension classes are those offerings that are not an integral part of approved one or two year curriculums.

Registration Fees

There shall be no registration fees charged for extension classes.

Instructional Supply Fee

Instructional supply fee varies with course.

PAYMENT OF FEES

All fees for the first month are due upon enrollment, unless prior arrangement for delayed payment is made with the Director. Subsequent monthly fees are due on the corresponding dates in the following months. Checks or money orders are to be made payable to the Pitt Industrial Education Center.

REFUNDS

Tuition refund for full-time students shall not be made unless the student is compelled to withdraw for unavoidable reasons. In such cases, $20.00 may be refunded if the student withdraws within twenty days (the first month of the quarter) after the beginning of the term. No refund may be given after twenty days.

Refund for the part-time and extension classes, because of the small amount of the fee, is not allowed.

STUDENT CONDUCT

Students will be expected to conduct themselves at all times as individuals of prudence and maturity. The rights and feelings of others will be respected. Each student shall demonstrate a high regard for school facilities and property and for the personal property of others.

School regulations which serve to control such activities as vehicle traffic and parking, smoking, loitering, and other aspects of personal conduct must be stringently observed.

Students may be promptly dismissed for conduct which is considered incompatible with standards of propriety and good judgment.

GRADING SYSTEM

Grades will be issued to all students who are failing at mid-term and final grades will be issued at the end of the term. Students will be graded on the acquirement of technical skills, ability to work under supervision, interest in work, initiative and the ability to apply related information.

Students enrolled in either the school of Technology or the school of Trades will be graded by the following system.

* A	93 - 100	Excellent
B	86 - 92	Above Average
C	78 - 85	Average
D	70 - 77	Passing
F	Below 70	Unsatisfactory
WP	Withdrawal passing	
WF	Withdrawal failing	
I	Incomplete	

* This grading system is subject to change, at a later date.

CERTIFICATE

The Pitt Industrial Education Center will grant a certificate upon the successful completion of a prescribed course of study.

SPECIAL SERVICES AND FACILITIES

ADDITIONAL COUNSELING AND TESTING

As mentioned under admission procedure, all applicants will be required to be subjected to a series of aptitude tests. This will be accomplished prior to acceptance and registration. The counselor will schedule interviews with students concerning interpretation of their test scores and he will advise students concerning course selections. Additional aptitude tests may be desirable to determine individual ability. Applicants are not encouraged to enroll unless it is believed that the student has made a sound choice and that he will profit from his choice.

Students are encouraged to use the counseling services at any time. The counseling service will work at all times with individuals to keep them informed of the progress they are making. Also, many reference materials are made available to students during the training program through the counseling service.

PLACEMENT SERVICE

Placement services are available to both present and former students of the Education Center. There is no charge to the student or to the employer.

The Industrial Education Center cooperates with the U. S. Employment Security Commission in the placement of graduates.

A Placement Committee assists in maintaining an effective program for contact between students and industrial employment managers, and oversees the program of interviewing schedules. The Center tries to effect placements that will be satisfactory from the standpoint of both the student and the employer.

LIBRARY FACILITIES

A technical Library, attended by a trained librarian, is available for use by the faculty and students of the Center. A wide selection of technical subject matter is covered. A limited number of reference books are also placed in the shops.

HOUSING FACILITIES

There are no dormitory or boarding facilities available on the school premises. Applicants who request aid will be assisted in every way possible. Nearby restaurants offer food services.

A Snack Room is provided for the convenience of the students during their recess periods.

EVENING SCHOOL PROGRAM

The Center conducts an Evening School Program to meet the educational requirements of men and women who desire to update or upgrade themselves to fill the growing need of industry for such people.

In order to be eligible to take one or more of the courses, a person must be employed in the occupational field in which the course is given. These courses are available to the industrial organizations, apprentice groups, and to individuals, when there is a sufficient number of students to begin a class. A class may be started if there are as many as twelve interested people who desire to take a particular course.

Pre-employment classes are also held in all curricula offered at the Center. Courses are taken directly from the State's Suggested Curriculum. Credit is granted at the satisfactory completion of these courses. When all courses in the curriculum are completed, a diploma is granted.

Length of evening programs may vary from a few hours to five years, meeting one to four nights per week.

The cost and other requirements are the same as shown in the general information section of the catalogue.

Class hours are arranged to suit the convenience of the employed students. Additional information concerning the Program may be obtained from the Director, the Associate Director, or by visiting or calling the Pitt Industrial Education Center.

COURSE NUMBERING SYSTEM

The following is an explanation of the method established for designating the trade and technical courses which appear in this publication:

1. Appropriate abbreviation prefix of the department or subject area responsible for the course of instruction. For example: CHEM is the abbreviation denoting a course in Chemistry.

2. The course number is assigned in accordance with the level of instruction involved:

   Trade level courses are assigned numbers within the range 001 to 299. Technical level courses are assigned numbers above 300.

   EXAMPLE: MECH 121 is the designation assigned to "Machine Shop Theory and Practice", a trade curriculum course.

   EXAMPLE: AG 314 "Farm Business Management", a technical level course in Agricultural Technology.

The following is a list of the abbreviations used in this publication:

DEPARTMENT AREAS AND ABBREVIATIONS

Agriculture	AG
Air Conditioning, Heating & Refrigeration	AHR
Automotive	AUTO
Business	BUS
Carpentry	CAR
Chemistry	CHEM
Drafting and Design	DD
Electrical	ELEC
Electronics	ELN
English	ENG
Industrial Science	ISc
Masonry	MAS
Mathematics	MA
Mechanical	MECH
Physics	PHY
Plumbing	PL
Practical Nursing	PN
Social Science	SOC
Welding	WELD

CONTACT HOURS AND CREDIT HOURS

These curriculums are to be offered on the basis of an average load of twenty-five contact hours per five-day week, eleven weeks per quarter, for six quarters. Students enrolled in a part-time program will be scheduled, based on class needs, to accomplish this average load, but over a longer period of time.

Quarterly credit hours are awarded to students on the following arrangement:

Credit of one quarter hour for each hour of class work per week for eleven weeks. The average hour of class will require two hours of assigned homework, for an average student.

Credit of one quarter hour for each two hours of laboratory work per week for eleven weeks. One hour of assigned homework will accompany an average laboratory period of two hours.

Credit of one quarter hour for each three hours of manipulative laboratory for eleven weeks. No outside work will ordinarily be assigned to accompany this shop period. Manipulative laboratories will be indicated by an asterisk.

The following definitions will explain the foregoing terms:

"Class work" is lecture and other classroom instruction.

"Laboratory" involves demonstration by instructor, experimentation and practice by students.

"Manipulative laboratory" involves development of manual skills and job proficiency.

AREAS OF TRAINING OFFERED

TECHNICIAN PROGRAMS

ENTRANCE REQUIREMENTS

TECHNICAL PROGRAMS

MINIMUM ADMISSION REQUIREMENTS

Requirements for admission of a candidate to the regular two-year technology program include the following qualifications. The candidate:

1. Must be a high school graduate or have a State approved equivalent education.

2. Must have high school credit for two units of mathematics, one of which is in algebra, and the other in plane geometry, or equivalent in modern mathematics. Competence may be determined by appropriate tests. Those who fail to meet the accepted standards for technical mathematics will be required to complete successfully a prerequisite mathematics course to remove the deficiency. A student with deficiencies may be admitted only when there is strong indication of probable success.

3. Should have completed one unit of physical science with laboratory.

4. Must submit the transcripts of high school and post-high school education.

5. Must demonstrate aptitude for technician training as determined by standard tests. These tests will aid in student selection, placement, and guidance. Institution guidance and counseling will be abailable to the student throughout his education, not just at the time of his enrollment.

6. Must be in acceptable condition of physical and mental health. Medical examination may be required at the discretion of the administration.

7. Must have an interview with a designated representative for discussing enrollment plans and lifetime career goals.

INTRODUCTION

Purpose of Curriculum

Rapid technological changes in farming and related agricultural businesses have given rise to the need for more technically-trained people. A variety of agricultural businesses and industries employ persons to assist in marketing, processing, and distributing of farm products and providing services to the farmer. Many responsible positions in agricultural businesses and industries require technical training not available in high schools or in four-year colleges.

The Agricultural Technology-Business Curriculum is designed to help students acquire knowledge, understandings, and abilities in the broad field of agricultural business. It combines knowledge of agriculture with business training, to prepare the graduate for one of the many varied employment opportunities in agricultural business. The specific objectives of the Agricultural Business Curriculum are to develop the following student competencies:

1. Understanding of the principles of organization and management in agricultural businesses, industries and farm operations.

2. Understanding of the basic principles of our economic system, marketing, credit, price concepts and governmental policies and programs relating to agriculture.

3. Understandings and skill in effective communication for agricultural business.

Job Description

As agricultural business and industry firms expand in size and number they are experiencing rapid changes in technologies of production, sales, and management, in an increasingly competitive environment. Future employees of such firms must be prepared to understand these changes and adapt themselves accordingly. Successful completion of this curriculum should enable a person to assume responsibilities in an agricultural firm and should enable him to advance within such a business.

Upon graduation from this curriculum an individual should qualify for various jobs in agricultural business and industry such as salesman or store manager in farm supply stores; agricultural field serviceman; salesman, demonstrator or plant manager of feed and food companies; farm products inspector; salesman, or office managers of farm products marketing firms.

AGRICULTURAL TECHNOLOGY - BUSINESS

SUGGESTED CURRICULUM BY QUARTERS

	Course Title	Course Hours Per Week		Quarter Hours Credit
FIRST QUARTER		Class	Lab.	
BUS 311	Business Mathematics	3	0	3
ENG 301	Communicative Skills: Reading Improvement	2	0	2
Ag 370	Animal Science	5	2	6
AG 310	Introduction to Agricultural Economics	5	2	6
		15	4	17
SECOND QUARTER				
BUS 320	Accounting	5	2	6
ENG 302	Communicative Skills: English	3	0	3
AG 312	Agricultural Marketing	5	2	6
Ag 420	Plant Science	5	2	6
		18	6	21
THIRD QUARTER				
BUS 321	Accounting	5	2	6
AG 314	Farm Business Management	5	4	7
ENG 303	Communicative Skills: Technical Writing	3	0	3
AG 492	Fertilizers and Lime	3	2	4
		16	8	20

		Course Title	Course Hours Per Week		Quarter Hours Credit
FOURTH QUARTER			Class	Lab.	
AG	316	Agricultural Finance	5	2	6
BUS	317	Sales Development	3	2	4
BUS	326	Business Organization and Operation	3	0	3
ENG	304	Communicative Skills: Speech	2	0	2
		Agriculture or Business: Elective	-	-	5
			13	4	20
FIFTH QUARTER					
Ag	306	Farm Chemicals	5	2	6
BUS	318	Business Law	5	0	5
AG	336	Farm Electrification	3	2	4
BUS	310	Written Sales Communications	3	2	4
			16	6	19
SIXTH QUARTER					
SOC	301	Human Relations	2	0	2
AG	326	Agricultural Program and Agencies	3	2	4
BUS	335	Business Management	3	0	3
BUS	309	Business Machines	0	4	2
AG	502	Agricultural Business Practium	198 MINIMUM HOURS		6
		Agriculture or Business: Elective	-	-	5
			8	6	22

AGRICULTURAL TECHNOLOGY - BUSINESS

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER	Course Hours Per Week: Class	Lab.	Quarter Hours Credit
BUS 311 Business Mathematics	3	0	3

This course stresses the fundamental operations and their application to business problems. Topics covered include payrolls, price marking, interest and discount, commission, insurance, taxes and other pertinent uses of mathematics in the field of business.
Prerequisite: None.

ENG 301 Communicative Skills: Reading Improvement	2	0	2

A concentrated effort to improve the student's ability to comprehend what he reads by training him to read more rapidly and accurately. Special machines are used for class drill to broaden the span of recognition, to increase eye coordination and word group recognition, and to train for comprehension in larger units. Reading faults of the individual are analyzed for improvement, and principles of vocabulary building are stressed.
Prerequisite: None.

AG 370 Animal Science	5	2	6

Basic principles of zoology and genetics as related to farm animals. The scientific study of all commercially important classes of farm animals.
Prerequisite: None.

AG 310 Introduction to Agricultural Economics	5	2	6

An introduction to economics, the functions of the economic system and agriculture's role in the economy. A review of the functions of the manager and an introduction to the principles he uses in making decisions to adjust to changing conditions. Analysis of the main sources of change which affect agricultural firms.
Prerequisite: None.

SECOND QUARTER

BUS 320 Accounting	5	2	6

Principles, techniques and tools of accounting, for understanding of the mechanics of accounting - collecting, summarizing, analyzing, and reporting information about service and merchantile enterprises to include practical application of the principles learned.
Prerequisite: None.

ENG 302 Communicative Skills: English	3	0	3

Designed to aid the student in the improvement of self-expression in business and technical composition. The approach is functional with emphasis on grammar, diction, sentence structure, punctuation, and spelling. Intended to stimulate students in applying the basic principles of English grammar in their day-to-day situations in industry and social life.
Prerequisite: None.

AG 312 Agricultural Marketing	5	2	6

An analysis of the functions of marketing in the economy and a survey of the problems marketing faces. A review of the market structure and the relationship of local, terminal, wholesale, retail and foreign markets. Problems in the operations of marketing firms including buying and selling, processing, standardization and grading, risk taking and storage, financing, efficiency, and cooperation. Discussion of procedures of marketing such commodities as grain, cotton, livestock and tobacco.
Prerequisite: AG 310.

Ag 420 Plant Science	5	2	6

An introductory general botany and crop science course covering the fundamental principles of the reproduction, growth, functions, and development of seed bearing plants with application to certain commercially important plants in North Carolina.
Prerequisite: None.

THIRD QUARTER

BUS 321 Accounting	5	2	6

Partnership and corporation accounting including a study of payrolls, Federal and State taxes. Emphasis is placed on the recording, summarizing and interpreting data for management control rather than on bookkeeping skills. Accounting services are shown as they contribute to the recognition and solution of management problems.
Prerequisite: BUS 320.

AG 314 Farm Business Management	5	4	7

A review of the functions of the manager of a business firm and the problems he faces. Development of the concept of planning by both partial and complete budgeting. Review of the concepts of costs and the length of run in production. Practice in preparing enterprise budgets as an aid in choosing what to produce. Use of partial budgeting to find the least cost production procedure. Analysis of production data to select the level of production that yields the most net revenue. Relationship between size, efficiency and income of a farm. Review of procedures for evaluating the efficiency of the manager.
Prerequisite: AG 310.

ENG 303 Communicative Skills: Technical Writing	3	0	3

The fundamentals of English are utilized as a background for the ogranization and techniques of modern technical writing. Exercises in developing typical technical reports, using writing techniques and graphic devices, are completed by the students. Practical application in the preparation of a full-length technical report is required of each student at the end of the term.
Prerequisite: None.

AG 492 Fertilizers and Lime	3	2	4

A review of the source, function, and use of the major and minor plant food elements; commercial fertilizer ingredients; soil acidity, liming materials; application of fertilizer and liming materials.
Prerequisite: None

FOURTH QUARTER

AG 316 Agricultural Finance	5	2	6

Analysis of the capital structure of modern commercial agriculture with emphasis on the sources of credit. Application of management principles in choosing the amount and kind of credit a farmer should use. A review of lending institutions, repayment schedules, and credit instruments. Practice in the procedure of evaluating farm resources with attention to information needed for resource valuation, appraisal of farms and procedures, discounting and depreciation. A review of the historical development of credit programs and institutions in the United States.
Prerequisite: AG 310.

BUS 317 Sales Development	3	2	4

A study of retail, wholesale and speciality selling. Emphasis is placed upon mastering and applying the fundamentals of selling. Preparation for and execution of sales demonstrations required.
Prerequisite: None.

BUS 326 Business Organization and Operation	3	0	3

A study of the legal structures of the various types of business organizations, methods of financing, internal organization and management.
Prerequisite: None.

ENG 304 Communicative Skills: Speech	2	0	2

Technical speech to develop the speaking skills with emphasis on the dual role of communications as both a speaking and listening skill. Stress is placed on growth in poise and confidence of the student. Practice through individual speeches and group discussion. Recordings are made of the student's voice and used as an aid in speech development.
Prerequisite: ENG 302.

FIFTH QUARTER

AG 306 Farm Chemicals	5	2	6

A study of farm chemical pesticides, their ingredients, formulation, and farm application, with emphasis on the effective and safe use of chemicals in agricultural pest control.
Prerequisite: None.

BUS 318 Business Law	5	0	5

Basic business laws including the law of contracts, negotiable instruments, agency, partnership, corporation, deeds of conveyance, etc., will be covered. A primary objective of the course is to enable the student to know when to consult a professional lawyer.
Prerequisite: None.

AG 336 Farm Electrification	3	2	4

A study of the basic principles and systems used in farm electrification. Application to agricultural production. Emphasis is on equipment for controlling the utilization of electricity.
Prerequisite: None.

BUS 310 Written Sales Communications	3	2	4

Develops skills in techniques in writing business communications. Emphasis is placed on writing action - getting sales letters and prospectuses. Business reports, summaries of business conferences, spot announcements for radio and television as well as letters involving credit, collections, adjustments, complaints, orders, acknowledgements, remittances, and inquiry are also included in this course.
Prerequisite: ENG 302.

SIXTH QUARTER

SOC 301 Human Relations	2	0	2

Principles of interpersonal relations including a consideration of motivation, feelings, emotions, and learning with reference to their applications to on-the-job situations; personal and group dynamics and self-adjustment.
Prerequisite: None

AG 326 Agricultural Programs and Agencies	3	2	4

A review of the public agriculture programs and agencies that provides services for agricultural producers. The objectives, organization, functions and services of these organizations.
Prerequisite: AG 310.

BUS 335 Business Management	3	0	3

Principles of business management including overview of major functions of management such as planning, staffing, controlling, directing, and financing. Clarification of the decision-making function versus the operating function. Role of management in business -- qualifications and requirement.
Prerequisite: None.

BUS 309 Business Machines	0	4	2

A general survey of the business and office machines. Students will receive training in techniques, processes, operation and application of 10-key adding machine, full-keyboard adding machine, calculator, posting and accounting machines, card punch, and card verifier.
Prerequisite: None.

AG 502 Agricultural Business Practicum 198 MINIMUM HOURS 6

Supervised learning experiences - learning experiences related to the instruction that require development beyond normal school hours and facilities - organized cooperatively between the school administration and selected agricultural industries or businesses. The student will gain practical experience under the supervision of agricultural businessmen and school personnel in an agricultural enterprise. Oral and written reports, field problems, and group discussions will be included.
Prerequisite: None.

ELECTRONICS TECHNOLOGY

INTRODUCTION

Purpose of Curriculum

The field of electronics has developed at a rapid pace since the turn of the century. For many years the major concern of electronics was in the area of communications. Developments during World War II and in the period since have revolutionized production techniques. New industries have been established to supplement the need and demand for electronics equipment.

Many opportunities exist for men and women with a technical education in electronics. This curriculum provides a basic background in electronic related theory with practical applications of electronics for business and industry. Courses are designed to develop competent electronics technicians who may take their place as an assistant to an engineer, or as a liaison between the engineer and the skilled craftsman.

Job Description

The electronics technician will start in one or more of the following areas: research, design, development, production, maintenance, or sales. He may be an assistant to an engineer, and engineering aide, laboratory technician, supervisor or equipment specialist. His training is similar to that of an engineer, but in less depth and more practical in application. He can function as a liaison between an engineer and the skilled craftsman.

ELECTRONICS TECHNOLOGY

SUGGESTED CURRICULUM BY QUARTERS

Course Title			Course Hours Per Week		Quarter Hours Credit
FIRST QUARTER			Class	Lab.	
MA	301	Technical Mathematics	5	0	5
PHY	301	Physics: Properties of Matter	2	3	4
ENG	301	Communicative Skills: Reading Improvement	2	0	2
DD	307	General Drafting	2	3*	3
ELEC	310	Direct Current Electricity	4	9	9
			15	15	23
SECOND QUARTER					
MA	302	Technical Mathematics	5	0	5
PHY	302	Physics: Work, Energy, Power	2	4	4
ENG	302	Communicative Skills: English	3	0	3
ELEC	311	Alternating Current Electricity	5	8	9
			15	12	21
THIRD QUARTER					
MA	303	Technical Mathematics	5	0	5
ENG	303	Communicative Skills: Technical Writing	3	0	3
SOC	301	Human Relations	1	0	1
ELN	312	Electronics I	5	12	11
			14	12	20

* "Manipulative laboratory" involves development of skills and job proficiency. Credit of one quarter hour for each three hours of laboratory.

Course Title			Course Hours Per Week		Quarter Hours Credit
FOURTH QUARTER			Class	Lab.	
MA	304	Technical Mathematics	3	0	3
PHY	304	Physics: Light and Sound	3	2	4
ENG	304	Communicative Skills: Speech	2	0	2
ELN	313	Electronics II	8	10	13
			16	12	22
FIFTH QUARTER					
1Sc	301	Industrial Organization and Management	2	0	2
ELN	316	Transistor Applications	4	6	7
ELN	317	Communications and Ultra High Frequency	3	6	6
ELN	318	Special Circuitry	3	4	5
			12	16	20
SIXTH QUARTER					
SOC	302	Economics	1	0	1
ELN	319	Instrumentation	5	8	9
ELN	320	Circuit Analysis and Maintenance	5	8	9
			11	16	19

ELECTRONICS TECHNOLOGY

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER	Course Hours Per Week: Class	Lab.	Quarter Hours Credit
MA 301 Technical Mathematics	5	0	5

The real number system is developed as an extension of natural numbers, integers, and rational numbers. Insight into the processes of arithmetic and algebra is provided. Additional topics include sets, equations, number bases, number lines, coordinate systems, trigonometry of the right triangle, vectors, dimensional analysis, and the derivative.
Prerequisite: None.

PHY 301 Physics: Properties of Matter	2	3	4

A fundamental course covering several basic principles of physics. The divisions included are solids and their characteristics, liquids in motion, gas laws and applications. Laboratory experiments and specialized problems dealing with these topics are part of this course.
Prerequisite: None.

ENG 301 Communicative Skills: Reading Improvement	2	0	2

A concentrated effort to improve the student's ability to comprehend what he reads by training him to read more rapidly and accurately. Special machines are used for class drill to broaden the span of recognition, to increase eye coordination and work group recognition, and to train for comprehension in larger units. Reading faults of the individual are analyzed for improvement, and principles of vocabulary building are stressed.
Prerequisite: None.

DD 307 General Drafting	2	3*	3

An introductory course in drafting for students needing a knowledge of drawing principles and practices for reading and describing objects in the graphic language. The student is expected to gain basic skills in drawing with instruments, lettering, geometrical constructions, freehand sketching, and describing objects orthographically with principal views. Freehand sketching and orthographic reading are to be emphasized.
Prerequisite: None.

ELEC 310 Direct Current Electricity	4	9	9

Basic electricity subjects include: structure of matter, electrical terminology and symbols, electron theory of current flow, magnets and magnetic fields. Rigorous mathematical analysis of direct current resistive circuits. Ohm's Law, Kirchhoff's Laws, Thevenin's Theorem, Norton's Theorem, the Superposition Principle and loop current method. Solution of complex resistive networks. Fundamental principles of inductors, capacitors, and time constants circuits are introduced.
Prerequisite: None.

SECOND QUARTER

MA 302 Technical Mathematics	5	0	5

Algebraic operations are applied to linear, quadratic, and polynomial functions and special equations of second degree. Complex numbers are introduced and the study of the derivative is continued. Selected applications involving rates of change, maxima and minima, approximation, areas, and volumes are considered.
Prerequisite: MA 301.

PHY 302 Physics: Work, Energy, Power	2	4	4

Major areas covered in this course are work, energy, and power. Instruction includes such topics as statics, forces, center of gravity, and dynamics. Units of measurement and their applications are a vital part of this course. A practical approach is used in teaching students the use of essential mathematical formulas.
Prerequisite: MA 301.

ENG 302 Communicative Skills: English	3	0	3

Designed to aid the student in the improvement of self-expression in business and technical composition. The approach is functional with emphasis of grammar, diction, sentence structure, punctuation, and spelling. Intended to stimulate students in applying the basic principles of English grammar in their day-to-day situations in industry and social life.
Prerequisite: None.

ELEC 311 Alternating Current Electricity	5	8	9

Alternating current and voltage: alternating current theory. Mathematical analysis is made of both sine and non-sine wave forms. Inductive reactance, capacitive reactance, and impedance characteristics of alternating current circuits are investigated. The use of vector and complex numbers in circuit impedance. Series and parallel resonant circuit conditions are compared and practical application of these conditions explained.
Prerequisite: ELEC 310, MA 301, PHY 301.

THIRD QUARTER

MA 303 Technical Mathematics	5	0	5

Ideas of algebra are used in a study of trigonometric , logarithmic and exponential functions. Selected applications of calculus reinforce this approach. Polar coordinates are introduced and their applications expanded. Complex numbers, vectors, coordinate systems and their applications constitute other areas of study.
Prerequisite: MA 302.

ENG 303 Communicative Skills: Technical Writing	3	0	3

The fundamentals of English are utilized as a background for the organization and techniques of modern technical writing. Exercises in developing typical technical reports, using writing techniques and graphic devices, are completed by the students. Practical application in the preparation of a full-length technical report is required of each student at the end of the term.
Prerequisite: ENG 302.

SOC 301 Human Relations	1	0	1

Principles of interpersonal relations including a consideration of motivation, feelings, emotions, and learning with reference to their applications to on-the-job situations; personal and group dynamics and self-adjustment.
Prerequisite: None

ELN 312 Electronics I	5	12	11

A treatment of electron tubes, semi-conductors and their associated circuitry; thermionic emission; diode, triode, tetrode and pentode characteristics. Theory of semi-conductor diode and transistor operation is studied in detail. Application of vacuum tubes and semi-conductors in power supplies, voltage amplifiers, power amplifiers, and the advantages and disadvantages of each considered.
Prerequisites: ELEC 310, MA 301, PHY 301.

FOURTH QUARTER

MA 304 Technical Mathematics	3	0	3

A further study of analytical geometry, algebra, and calculus: the binomial expansion, artithmetic and geometric progressions, polynomial functions and methods of solution, integration techniques and use of integral tables, polar equations, and an introduction to solid analytical geometry.

Prerequisite: MA 303.

PHY 303 Physics: Light and Sound	3	2	4

A study of sound and wave motion and its technical applications to industry and related fields. Light and illumination. Principles of optical instruments. Practical aspects are emphasized.
Prerequisite: MA 301.

ENG 304 Communicative Skills: Speech	2	0	2

Technical speech to develop the speaking skills with emphasis on the dual role of communications as both a speaking and listening skill. Stress is placed on growth in poise and confidence of the student. Practice through individual speeches and group discussion. Recordings are made of the student's voice and used as an aid in speech development.
Prerequisite: ENG 302.

ELN 313 Electronics II	8	10	13

Design and analysis of vacuum tube and transistor oscillators, radio frequency analysis and intermediate frequency amplifiers. Frequency response, stage gain, distortion, noise characteristics, and frequency stability will be explored.
Prerequisites: ELN 312, MA 303.

FIFTH QUARTER

1Sc 301 Industrial Organization and Management	2	0	2

Organizational structure for industrial management; operational and financial activities, including accounting, budgeting, banking, credit and industrial risk, forecasting of markets, selection and layout of physical facilities; selection, training and supervision of personnel as found in typical industrial organizations.
Prerequisite: None.

ELN 316 Transistor Applications	4	6	7

Transistor circuitry and design problems. Junction diodes, transistor triodes, tunnel and zener diodes with associated circuitry. Temperature variation, transit time, and frequency response are studied in detail.
Prerequisites: ELN 313, MA 304.

ELN 317	Communications and Ultra High Frequency	3	6	6

Application of previously studied circuits to the board field of communications and ultra high frequency. Amplitude and frequency modulated transmitters, receivers, wave guides, cavity resonators; klystron, magnetron and traveling wave tubes are discussed.
Prerequisite: ELN 313.

ELN 318	Special Circuitry	3	4	5

The design and analysis of special circuitry: wave shaping, pulse techniques, broad-band amplifiers, diode switches, multivibrators, gates, magnetic amplifiers, chopper amplifiers, clipper and clamping circuits, synchro and servo systems, photo control devices, step counters and other specific application circuitry.
Prerequisites: ELN 314, ELN 316.

SIXTH QUARTER

SOC 302	Economics	1	0	1

The fundamental principles of economics including the institutions and practices by which people gain a livelihood. Included is a study of the laws of supply and demand and the principles bearing upon production, exchange, distribution, and consumption both in relation to the individual enterprise and to society at large.
Prerequisite: None.

ELN 319	Instrumentation	5	8	9

A basic study of sensory devices for detecting changes in pressure, temperatures, sound, light, and electricity; the associated circuitry and indicating devices.
Prerequisites: ELN 316, ELN 318.

ELN 320	Circuit Analysis and Maintenance	5	8	9

Systematic analysis of complex circuitry. Methods of locating and correcting malfunctions. Troubleshooting by voltage measurements; resistance measurements, and waveform observations. Schematic reading and interpretation.
Prerequisites: ELN 319, MA 304, PHY 304.

MECHANICAL TECHNOLOGY - DRAFTING AND DESIGN

INTRODUCTION

Purpose of Curriculum

This curriculum guide was prepared for the purpose of outlining a training program for students of drafting and design technology. There are certain identifiable duties which are common to all technicians of this general classification and which comprise the basic areas of technical knowledge they need. This curriculum has been designed for training persons in the accepted performance of these basic duties that will be assigned, and to enable the individual student to become proficient in a short time after he becomes employed in the industry.

Courses in general education have been included to give a student the assurance that comes with education upon a broad base. The technician associates with many levels of thought and expression -- administrative, personnel, scientists, engineers, skilled workmen - and must be able to communicate effectively with all levels. Courses in the skills of communication, human relations, economics and the field of industrial organization and management have been provided to assist the student to develop understanding and confidence. Courses containing essential information from related subject areas, such as methematics, physics, and mechanics have been included, in order to provide the student a better academic base for his training.

Job Description

Mechanical drafting and design technicians are concerned with the preparation of drawings for design proposals, for experimental models and items for production use.

These technicians perform many aspects of design in a specialized field, such as the developing of the design of a section, sub-assembly or major component. Investigating design factors and availability of material and equipment production methods and facilities are frequent assignments. They also design units and controls from specifications by utilizing drawings of existing units and reports on functional performance or design components in industrial fields based on engineers' original design concepts or specific ideas. They are assigned as coordinators for the execution of related work of other design, production, tooling, material and planning groups. Technicians in this classification will often supervise the preparation of working drawings.

These technicians are employed in many types of manufacturing, fabrication, research development and service industries. Substantial numbers are also employed in communications, transportation, public utilities, construction industries, engineering and architectural consulting firms, and federal, state and local governments.

MECHANICAL TECHNOLOGY - DRAFTING AND DESIGN

SUGGESTED CURRICULUM BY QUARTERS

Course Title			Course Hours Per Week		Quarter Hours Credit
FIRST QUARTER			Class	Lab.	
DD	301	Technical Drafting	2	6*	4
MA	301	Technical Mathematics	5	0	5
ENG	301	Communicative Skills: Reading Improvement	2	0	2
PHY	301	Physics: Properties of Matter	3	2	4
MECH	301	Materials, Tools and Processes	2	2	3
			14	10	18
SECOND QUARTER					
DD	302	Technical Drafting	2	6*	4
MA	302	Technical Mathematics	5	0	5
ENG	302	Communicative Skills: English	3	0	3
PHY	302	Physics: Work, Energy, Power	3	2	4
MECH	302	Materials, Tools and Processes	2	2	3
			13	10	19
THIRD QUARTER					
DD	303	Technical Drafting	2	6*	4
MA	303	Technical Mathematics	5	0	5
ENG	303	Communicative Skills: Technical Writing	3	0	3
PHY	303	Physics: Electricity	3	2	4
MECH	303	Materials, Tools and Processes	2	2	3
			15	10	19

*"Manipulative laboratory" involves development of skills and job proficiency. Credit of one quarter hour for each three hours of laboratory.

FOURTH QUARTER

DD	304	Technical Drafting	2	6*	4
DD	310	Descriptive Geometry	2	4	4
ENG	304	Communicative Skills: Speech	2	0	2
ELN	301	Industrial Controls	3	2	4
MECH	304	Metallurgy	3	2	4
			11	14	17

FIFTH QUARTER

DD	305	Design Drafting I	2	6*	4
MECH	305	Strength of Materials	3	2	4
PHY	305	Hydraulics and Pneumatics	2	4	4
DD	311	Mechanisms	3	2	4
			10	14	16

SIXTH QUARTER

DD	306	Design Drafting II	4	6*	6
DD	312	Jig and Fixture Design	2	4	4
SOC	302	Economics	3	0	3
1Sc	301	Industrial Organization and Management	3	0	3
SOC	301	Human Relations	2	0	2
			14	10	18

MECHANICAL TECHNOLOGY - DRAFTING AND DESIGN

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER	Course Hours Per Week: Class	Lab.	Quarter Hours Credit
DD 301 Technical Drafting	2	6*	4

Introduction to drafting and design practices and principles. Attainment of basic skills and techniques of drafting: use of drafting equipment; lettering; freehand orthographic and pictorial sketching; geometric construction; orthographic instrument drawing of principal views; and standards and practices of dimensioning and noting. Methods of reproducing, filing, and storing drawings are studied and the student is introduced to "working drawings".
Prerequisite: None.

MA 301 Technical Mathematics	5	0	5

The real number system is developed as an extension of natural numbers, integers, and rational numbers. Insight into the processes of arithmetic and algebra is provided. Additional topics include sets, equations, number bases, number lines, coordinate systems, trigonometry of the right triangle, vectors, dimensional analysis, and the derivative.
Prerequisite: None.

ENG 301 Communicative Skills: Reading Improvement	2	0	2

A concentrated effort to improve the student's ability to comprehend what he reads by training him to read more rapidly and accurately. Special machines are used for class drill to broaden the span of recognition, to increase eye coordination and word group recognition, and to train for comprehension in larger units. Reading faults of the individual are analyzed for improvement, and principles of vocabulary building are stressed.
Prerequisite: None.

PHY 301 Physics: Properties of Matter	3	2	4

A fundamental course covering several basic principles of physics. The divisions included are solids and their characteristics, liquids in motion, gas laws and applications. Laboratory experiments and specialized problems dealing with these topics are part of this course.
Prerequisite: None.

MECH 301	Materials, Tools and Processes	2	2	3

An overall view of the methods and procedures used to transform raw materials into finished products. Characteristics of metals, woods, and plastics and how these characteristics affect the selection and use of materials and methods of production in the manufacture of an object. Unit production system, sand casting, forging and allied processes, welding, sheet metal working processes, and woodworking processes constitute areas of study.
Prerequisite: None.

SECOND QUARTER

DD 302	Technical Drafting	2	6*	4

The application of orthographic projection principles to the more complex drafting problems, primary and secondary auxiliary views, simple and successive revolutions, and sections and conventions will be studied. The introduction of the graphical analysis of space problems involving points, lines, planes, and a combination of these elements. Precision and limit dimensioning practices.
Prerequisite: DD 301

MA 302	Technical Mathematics	5	0	5

Algebraic operations are applied to linear, quadratic, and polynomial functions and special equations of second degree. Complex numbers are introduced and the study of the derivative is continued. Selected applications involving rates of change, maxima and minima, approximation, areas, and volumes are considered.
Prerequisite: MA 301.

ENG 302	Communicative Skills: English	3	0	3

Designed to aid the student in the improvement of self-expression in business and technical composition. The approach is functional with emphasis on grammar, diction, sentence structure, punctuation, and spelling. Intended to stimulate students in applying the basic principles of English grammar in their day-to-day situations in industry and social life.
Prerequisite: None.

PHY 302	Physics: Work, Energy, Power	3	2	4

Major areas covered in this course are work, energy, and power. Instruction includes such topics as statics, forces, center of gravity, and dynamics. Units of measurement and their applications are a vital part of this course. A practical approach is used in teaching students the use of essential mathematical formulas.
Prerequisite: PHY 301, MA 301.

MECH 302 Materials, Tools and Processes	2	2	3

Study of manufacturing processes involving machining of materials. The operation of lathes, grinders, drills, milling machines, shapers, planers, metal sawing machines, broaching machines, gear cutting machines, and finishing machines. Dimensional control and precision measuring as applied to machining of materials.
Prerequisite: MECH 301.

THIRD QUARTER

DD 303 Technical Drafting	2	6*	4

Intersection and developments and their practical solutions. Where applicable, model solutions accompany the problems. The various techniques employed to produce and render isometric and oblique drawings, isometric, dimetric and trimetric projections, will be included.
Prerequisite: DD 302.

MA 303 Technical Mathematics	5	0	5

Ideas of algebra are used in a study of trigonometric, logarithmic and exponential functions. Selected applications of calculus reinforce this approach. Polar coordinates are introduced and their applications expanded. Complex numbers, vectors, coordinate systems and their applications constitute other areas of study.
Prerequisite: MA 302.

ENG 303 Communicative Skills: Technical Writing	3	0	3

The fundamentals of English are utilized as a background for the organization and techniques of modern technical writing. Exercises in developing typical technical reports, using writing techniques and graphic devices, are completed by the students. Practical application in the preparation of a full-length technical report is required of each student at the end of the term.
Prerequisite: ENG 302.

PHY 303 Physics: Electricity	3	2	4

Basic theories of electricity, types of electricity, methods of production, and transmission and transforming of electricity. Electron theory, electricity by chemical action, electricity by friction, electricity by magnetism, induction voltage, amperage, resistance, horsepower, wattage, and transformers are major parts of the course.
Prerequisites: PHY 301 MA 302.

MECH 303	Materials, Tools and Processes	2	2	3

Mass-production methods and design factors in areas of castin, forging, molding, pressing, drilling, boring, reaming, turning, grinding, milling, and surfact finishing.
Prerequisite: MECH 302.

FOURTH QUARTER

DD 304	Technical Drafting	2	6*	4

Applications and constructions of charts, graphs, and nomographs in engineering and technical data. Screw threads, springs, keys, rivets, piping, and welding symbols, methods of representing and specifying will be covered. Basic mechanisms of motion transfer, gears and cams, will be studied and drawn with emphasis on methods of specifying, calculating, dimensions, and delineating.
Prerequisite: DD 303.

DD 310	Descriptive Geometry	2	4	4

Graphic analysis of space problems involving points, lines, planes, connectors, and a combination of these. Practical design problems will be stressed with analytical verification where applicable. Visualization shall be stressed on every problem.
Prerequisites: DD 302, MA 302.

ENG 304	Communicative Skills: Speech	2	0	2

Technical speech to develop the speaking skills with emphasis on the dual role of communications as both a speaking and listening skill. Stress is placed on growth in poise and confidence of the student. Practice through individual speeches and group discussion. Recordings are made of the student's voice and used as an aid in speech development.
Prerequisite: ENG 302.

ELN 301	Industrial Controls	3	2	4

Industrial controls is the study of modern methods of controlling machinery by electronic circuitry. Machinery controls and electronic mechanisms that automatically operate machines will be studied. Types of motors, generators, control signals and devices, thyratrons, gates, switches, and servomechanism circuits are major areas of study.
Prerequisite: PHY 303.

MECH 3-4 Metallurgy	3	2	4

Properties of metals and various methods of changing these properties, classifications of metals, powder metallurgy and factors contributing to production and selection of metals for use.
Prerequisite: None.

FIFTH QUARTER

DD 305 Design Drafting I	2	6*	4

Basic design is introduced in the study of motion transfer mechanisms as they relate to power trains. Principles of design sketching, design drawing, layout drafting, detailing from layouts, production drawings and simplified drafting practices constitute areas of study. Types and methods of specifying materials and workmanship are an integral part of the course.
Prerequisites: DD 304, MA 302, PHY 303.

MECH 305 Strength of Materials	3	2	4

Study of principles and analysis of stresses which occur within machine and structure elements subjected to various types of loads such as static, impact, varying and dynamic. Analyses of these stresses are made as applied to thin-walled cylinders and spheres, riveted and welded joints, beams, columns and machine components.
Prerequisites: PHY 303, MA 303.

PHY 305 Hydraulics and Pneumatics	2	4	4

The basic theories of hydraulic and pneumatic systems. Combinations of systems in various circuits. Basic designs and functions of circuits and motors, controls, electrohydraulic servomechanisms, plumbing, filtration, accumulators and reservoirs.
Prerequisite: PHY 302.

DD 311 Mechanisms	3	2	4

Mathematical and drafting room solutions of problems involving the principles of machine elements. Study of motions of linkages, velocities and acceleration of points within a link mechanism; layout methods for designing cams, belts, pulleys, gears and gear trains.
Prerequisites: DD 304, MA 303, PHY 302.

SIXTH QUARTER

DD 306 Design Drafting II	4	6*	6

Research to solve a problem in design by consulting various manuals, periodicals, and through laboratory experiments. A written technical report, preliminary design sketches, layout drawings, detail drawings, assembly and sub-assembly drawings, pictorial drawings, exploded pictorial assembly, patent drawings, and specifications are required as a part of the problem.
Prerequisites: DD 305, DD 310.

DD 312 Jig and Fixture Design	2	4	4

Commercial standards, principles, practices and tools of jig and fixture design. Individual project and design work to acquaint students with the types of jigs and fixtures and their design.
Prerequisites: DD 305, DD 311.

SOC 302 Economics	3	0	3

The fundamental principles of economics including the institutions and practices by which people gain a livelihood. Included is a study of the laws of supply and demand and the principles bearing upon production, exchange, distribution, and consumption both in relation to the individual enterprise and to society at large.
Prerequisite: None.

1Sc 301 Industrial Organization and Management	3	0	3

Organizational structure for industrial management; operational and financial activities, including accounting, budgeting, banking, credit and industrial risk, forecasting of markets, selection and layout of physical facilities; selection, training and supervision of personnel as found in typical industrial organizations.
Prerequisite: None.

SOC 301 Human Relations	2	0	2

Principles of interpersonal reations, including a consideration of motivation, feelings, emotions, and learning with reference to their applications to on-the-job situations; personal and group dynamics and self-adjustment.
Prerequisite: None.

AREAS OF TRAINING OFFERED

TRADE PROGRAMS

ADMISSION REQUIREMENTS - TRADE PROGRAM

The following are minimum admission requirements to the regular one-year trade preparatory curriculums and vocational programs:

MINIMUM ADMISSION REQUIREMENTS

A candidate for admission to the regular trade-vocational training programs must meet the following qualifications:

1. Must be at least 16 years of age and have the ability to enter into or make advancement in the area in which enrolled.

2. Must have satisfactorily completed a minimum of eight (8) units of accredited secondary school work. Those who have not successfully completed eight (8) units of such work will be required to take other standard and/or local institution tests.

3. Must demonstrate aptitude for trade-vocational training as determined by standard and/or local institution tests to insure ability to meet job requirements in the desired trade.

4. Must have one (1) unit of secondary school algebra or an equivalent in modern mathematics. Those who have deficiencies will be required to remove the deficiency before completing their training.

   Provisional admittance may be granted at the discretion of the Center administration.

5. Must have a personal interview with designated school representative.

6. Must be in acceptable condition of physical and mental health to meet qualifications for a given occupation.

ARCHITECTURAL DRAFTING

INTRODUCTION

Purpose of Curriculum

This curriculum is designed to prepare students to enter the field of architectural drafting. The first two quarters contain courses basic to all fields of drafting. The third and fourth quarters contain specialization and related courses that prepare one to enter architectural drafting occupations.

Each course is prepared to enable an individual to advance rapidly in drafting proficiency upon entering the field of work. Courses are arranged in sequence to develop drafting skills and proficiency in mathematics and science. The draftsman associates with many levels of personnel- - administrative, architects, engineers, skilled workmen -- and must be able to communicate effectively with them. Courses to develop knowledge and skills in communication, human relations, economics and industrial organization are provided to assist the student in developing understandings and confidence in his relations with other persons.

Job Description

Draftsman prepares clear, complete, and accurate working plans and detail drawings, from rough or detailed sketches or notes for engineering or manufacturing purposes, according to the specified dimensions: Makes final sketch of the proposed drawing, checking dimension of parts, materials to be used, the relation of one part to another, and the relation of the various parts to the whole structure. Makes any adjustments or changes necessary or desired. Inks in all lines and letters on pencil drawings as required. Exercises manual skill in the manipulation of triangle, T-square, and other drafting tools. Lays tracing paper on drawing and traces drawing in ink. Makes charts for representation of statistical data, Makes finished designs from sketches. Utilizes knowledge of various machines, engineering practices, mathematics, building materials, and other physical sciences to complete the drawings.

Architectural draftsman. Performs duties of draftsman but specializes in organizing and drawing of working drawings from final preliminary sketches from the architectural designer, mechanical and structural drawings included.

ARCHITECTURAL DRAFTING

SUGGESTED CURRICULUM BY QUARTERS

Course Title			Course Hours Per Week			Quarter Hours Credit
FIRST QUARTER			Class	Lab.	Shop Prac.	
DD	131	Drafting	3	0	12	7
MA	121	Geometry	3	0	0	3
ENG	191	Reading Improvement	2	0	0	2
PHY	104	Applied Physics I	1	2	0	2
DD	105	Drafting Analysis	2	0	0	2
			11	2	12	16
SECOND QUARTER						
DD	132	Drafting	3	0	12	7
MA	124	Algebra	5	0	0	5
ENG	102	Communication Skills	2	0	0	2
PHY	105	Applied Physics II	1	2	0	2
DD	135	Descriptive Geometry	1	4	0	3
			12	6	12	19
THIRD QUARTER						
DD	141	Architectural Drafting	3	0	12	7
MA	126	Trigonometry	3	0	0	3
PHY	106	Applied Physics III	1	2	0	2
DD	144	Architectural Materials and Methods	4	0	0	4
DD	143	Architectural Mechanical Equipment	3	0	0	3
			14	2	12	19

		Course Title	Course Hours Per Week			Quarter Hours
FOURTH QUARTER			Class	Lab.	Shop Prac.	Credit
DD	142	Architectural Drafting	3	0	12	7
DD	145	Specifications and Contracts	3	0	0	3
CIV	101	Surveying	2	0	3	3
SOC	101	Human Relations	2	0	0	2
1Sc	102	Industrial Organizations	3	0	0	3
			13	0	15	18

ARCHITECTURAL DRAFTING

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER	Course Hours Per Week: Class	Lab.	Shop Prac.	Quarter Hours Credit
DD 131 Drafting	3	0	12	7

An introduction to drafting and the study of drafting practices. Instruction is given in the selection, use and care of instruments, singlestroke lettering, applied geometry, freehand sketching consisting of orthograpic and pictorial drawings. Orthographic projection, reading and instrument drawing of principal views, single auxiliary views (primary), and double (oblique) auxiliary views will be emphasized. Dimensioning and note practices will be studied with reference to the American Standards Association practices. Methods of reproducing drawings will be included at the appropriate time.
Prerequisite: None.

MA 121 Geometry	3	0	0	3

Fundamental properties and definitions; plane and solid geometric figures, selected general theorems, geometric construction of lines, angles and plane figures. Dihedral angles, areas of plane figures, volumes of solids. Geometric principles are applied to shop operations.
Prerequisite: None.

ENG 101 Reading Improvement	2	0	0	2

A concentrated effort to improve the student's ability to comprehend what he reads by training him to read more rapidly and accurately. Special machines are used for class drill to broaden the span of recognition, to increase eye coordination and word group recognition, and to train for comprehension in larger units. Reading faults of the individual are analyzed for improvement, and principles of vocabulary building are stressed.
Prerequisite: None.

PHY 104 Applied Physics I	1	2	0	2

Introductory physics and its applications. Systems of measurement, theory of matter, properties of solids, liquids, and gases.
Prerequisite: None.

DD 105 Drafting Analysis	2	0	0	2

The trainee will make an analysis of the various drafting field options offered in the Center. This analysis will include selected reading assignments concerning the options. A study of the job descriptions concerning those areas in the Dictionary of Occupational Titles, a study of blueprints in the option fields, and preparation of sketches illustrating major differences in the types of drawings.
Prerequisite: None.

SECOND QUARTER

DD 132 Drafting	3	0	12	7

The trainee will study simple and successive revolutions and their applications to practical problesm. Sections and conventions will be studied and both detail and assembly sections will be drawn. Intersections and developments will be studied by relating the drawing to the sheet metal trades. Models of the assigned drawings will be made from construction paper, cardboard, or similar materials as a proof of the solution to the problems drawn.

Methods of drawing and projecting axonometric, oblique, and perspective drawings will be studied with emphasis on the practical applications of pictorial drawings. Various methods of shading will be introduced and dimensioning and sectioning of oblique and axonometric pictorials will be done.
Prerequisite: DD 131.

MA 124 Algebra	5	0	0	5

Basic concepts and operations of algebra: historical background of our base-10 number system; algebraic operations: addition, subtraction, multiplication and division; fractions, letter representation, grouping, factoring, ratio and proportions, variation; graphical and algebraic solution of first degree equations; solution of simultaneous equations by: addition and subtraction, substitution, graphing; exponents, logarithms, tables and interpolation.
Prerequisite: None.

ENG 102 Communication Skills	2	0	0	2

Development of ability to communicate effectively through the medium of good language usage in speaking and writing. Organizing thoughts, and presenting thoughts effectively in connection with problems.
Prerequisite: None.

PHY 105 Applied Physics II	1	2	0	2

Basic principles of electricity, types of electricity, and its production, transmission, and transformation. Such factors as the electron theory, electrical measurement, magnetism, electromagnetism, and the magnetic effects of electricity constitute major areas of study.
Prerequisite: PHY 104.

DD 135 Descriptive Geometry	1	4	0	3

Graphical analysis of space problems. The problems deal with practical design elements involving points, lines, planes, connectors, and a combination of these. Included are problems dealing with solid geometry theorems. Where applicable, each graphical solution shall be accompanied by the analytical solution.
Prerequisite: DD 131.

THIRD QUARTER

DD 141 Architectural Drafting	3	0	12	7

An introduction to architectural drafting. Further development of techniques in lettering, dimensioning, freehand sketching and instrument drawing. Drawings of construction details, using appropriate material symbols and conventions. Working drawings, including plans, elevations, sections, scale details and full-size details will be prepared from preliminary sketches.
Prerequisite: DD 132.

MA 126 Trigonometry	3	0	0	3

Trigonometric ratios; solving problems with right triangles; using tables, and interpolating; solution of oblique triangles using law of sines and law of cosines; graphs of the trigonometric functions; inverse functions, trigonometric equations. All topics are applied to practical problems.
Prerequisites: MA 121, MA 124.

PHY 106 Applied Physics III	1	2	0	2

Physical principles of force, energy, work and power; equilibrium and the laws of motion; principles of machines, mechanical advantage, and transmission of power in practical applications, and the use of vectors and graphical presentations.
Prerequisite: PHY 104.

DD 144	Architectural Materials and Methods	4	0	0	4

Materials used in the construction of architectural structures will be studied. Their economic values and limitations affected by locality, budget and codes. Field trips to construction sites and study of manufacturer's specifications for materials. Standard sizes of structural materials and modular construction techniques.
Prerequisite: None.

DD 143	Architectural Mechanical Equipment	3	0	0	3

General study of heating, air conditioning, plumbing and electrical equipment, materials and symbols. Building code requirements pertaining to residential and commercial structures. Reading and interpretation of working drawings by mechanical engineers.
Prerequisite: DD 132.

FOURTH QUARTER

DD 142	Architectural Drafting	3	0	12	7

Individual and group participation in the preparation of complete working drawings for a complex architectural structure. Study of drafting room organization and relationships of personnel within the architectural office.
Prerequisites: DD 141, DD 143, DD 144.

DD 145	Specifications and Contracts	3	0	0	3

The purpose and writings of specifications will be studied along with their legal and practical application to working drawings. Contract documents will be analyzed and studied for the purpose of client-architect-contractor responsibilities, duties and mutual protection.
Prerequisites: DD 141, DD 143, DD 144.

CIV 101	Surveying	2	0	3	3

Basic instrumentation and topography will be studied, together with field trips and drafting room application of site surveying.
Prerequisite: MA 104.

SOC 101	Human Relations	2	0	0	2

Development of understanding of relationships to other persons through some of the basic principles of human psychology. The problems of the individual and his work situation are studied in relation to the established organization of modern business and industry and in relation to government practices and labor organization, with special emphasis on the operating responsibilities of good management.
Prerequisite: None.

1 Sc	102	Industrial Organizations	3	0	0	3

Methods, techniques, and practices of modern management in planning, organizing and controlling operations of a manufacturing concern. Introduction to the competitive system and the factors constituting product cost.
Prerequisite: None.

AUTOMOTIVE MECHANICS

INTRODUCTION

Purpose of Curriculum

This curriculum provides a training program for developing the basic knowledge and skills needed to inspect, diagnose, repair or adjust automotive vehicles. Manual skills are developed in practical shop work. Thorough understanding of the operating principles involved in the modern automobile comes in class assignments, discussion, and shop practice.

Complexity in automotive vehicles increases each year because of scientific discovery and new engineering. These changes are reflected not only in passenger vehicles, but also in trucks, buses, and a variety of gasoline-powered equipment. This curriculum provides a basis for the student to compare and adapt to new techniques for servicing and repair as vehicles are changed year by year.

Job Description

Automobile mechanics maintain and repair mechanical, electrical, and body parts of passenger cars, trucks, and buses. In some communities and rural areas they also may service tractors or marine engines and other gasoline-powered equipment. Mechanics inspect and test to determine the causes of faulty operation. They repair or replace defective parts to restore the vechicle or machine to proper operating condition. They use shop manuals and other technical publications.

Automotive mechanics in smaller shops usually are general mechanics qualified to perform a variety of repair jobs. A large number of automobile mechanics specialize in particular types of repair work. For example, some may specialize in repairing only power steering and power brakes, or automatic transmissions. Usually such specialists have an all-round knowledge of automotive repair and may occasionally be called upon to do other types of work.

AUTOMOTIVE MECHANICS

SUGGESTED CURRICULUM BY QUARTERS

Course Title			Course Hours Per Week			Quarter Hours Credit
FIRST QUARTER			Class	Lab.	Shop Prac.	
AUTO	121	Automotive Engines	3	0	12	7
MA	120	Fundamentals of Mathematics	5	0	0	5
ENG	101	Reading Improvement	2	0	0	2
PHY	104	Applied Physics I	1	2	0	2
			11	2	12	16
SECOND QUARTER						
AUTO	122	Automotive Electrical and Fuel Systems	3	0	12	7
PHY	105	Applied Physics II	1	2	0	2
ENG	102	Communication Skills	2	0	0	2
DD	121	Blue Print Reading	3	0	0	3
			9	2	12	14
THIRD QUARTER						
AUTO	123	Automotive Chassis and Suspensions	3	0	12	7
AHR	101	Automotive Air Conditioning	3	0	0	3
SOC	101	Human Relations	2	0	0	2
MECH	112	Welding	0	0	3	1
PHY	106	Applied Physics III	1	2	0	2
			9	2	15	15
FOURTH QUARTER						
AUTO	124	Automotive Power Train Systems	3	0	9	6
SOC	103	Management Procedures	3	0	0	3
AUTO	125	Automotive Servicing	3	0	9	6
			9	0	18	15

AUTOMOTIVE MECHANICS

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER	Course Hours Per Week: Class	Lab.	Shop Prac.	Quarter Hours Credit
AUTO 121 Automotive Engines	3	0	12	7

Development of a thorough knowledge and ability in using, maintaining, and storing the various hand tools and measuring devices needed in automotive repair work. Study of the construction and operation of components of automotive engines. Testing of engine performance; servicing and maintenance of pistons, valves, cams and camshafts, fuel and exhaust systems, cooling systems; proper lubrication; and methods of testing, diagnosing and repairing.
Prerequisite: None.

MA 120 Fundamentals of Mathematics	5	0	0	5

Practical number theory. Analysis of basic operations: addition, subtraction, multiplication and division. Fractions, decimals, powers and roots, percentages, ratio and proportion. Plane and solid geometric figures used in industry; measurement of surfaces and volumes. Introduction to algebra used in trades. Practice in depth.
Prerequisite: None.

ENG 101 Reading Improvement	2	0	0	2

A concentrated effort to improve the student's ability to comprehend what he reads by training him to read more rapidly and accurately. Special machines are used for class drill to broaden the span of recognition, to increase eye coordination and word group recognition, and to train for comprehension in larger units. Reading faults of the individual are analyzed for improvement, and principles of vocabulary building are stressed.
Prerequisite: None.

PHY 104 Applied Physics I	1	2	0	2

Introductory physics and its applications. Systems of measurement, theory of matter, properties of solids, liquids, and gases.
Prerequisite: None.

SECOND QUARTER

AUTO 122 Automotive Electrical and Fuel Systems	3	0	12	7

A thorough study of the electrical and fuel systems of the automobile. Battery cranking mechanism, generator, ignition, accessories and wiring; fuel pumps, carburetors, and fuel injectors. Characteristics of fuels, types of fuel systems, special tools, and testing equipment for the fuel and electrical system.
Prerequisite: AUTO 121.

PHY 105 Applied Physics II	1	2	0	2

Basic principles of electricity, types of electricity, and its production, transmission, and transformation. Such factors as the electron theory, electrical measurement, magnetism, electromagnetism, and the magnetic effects of electricity constitute major areas of study.
Prerequisite: PHY 104.

ENG 102 Communication Skills	2	0	0	2

Development of ability to communicate effectively through the medium of good language usage in speaking and writing. Organizing thoughts, and presenting thoughts effectively in connection with problems.
Prerequisite: None.

DD 121 Blueprint Reading	3	0	0	3

Interpretation and reading of blue prints. Development of ability to read and interpret blue prints, charts, instruction and service manuals, and wiring diagrams. Information on the basic principles of lines, views, dimensioning procedures, and notes.
Prerequisite: None.

THIRD QUARTER

AUTO 123 Automotive Chassis and Suspensions	3	0	12	7

Principles and functions of the components of automotive chassis. Practical job instruction in adjusting and repairing of suspension, steering and braking systems. Units to be studied will be shock absorbers, springs, steering systems, steering linkage, front end, types and servicing of brakes.
Prerequisite: AUTO 122.

SOC 103	Management Procedures	3	0	0	3

An introduction to the business world, problems of small business operation, basic business law, business forms and records, financial problems, ordering and inventorying, layout of equipment and offices, methods of improving business, and employer-employee relations.
Prerequisite: None

AUTO 125	Automotive Servicing	3	0	9	6

Emphasis is on the shop procedures necessary in determining the nature of troubles developed in the various component systems of the automobile. Troubleshooting of automotive systems, providing a full range of testing, adjusting, repairing and replacing experiences.
Prerequisite: AUTO 123.

AHR 101	Automotive Air Conditioning	3	0	0	3

General introduction to the principles of refrigeration; study of the assembly of the components and connections necessary in the mechanisms, the methods of operation, and control; proper handling of refrigerants in charging the system.
Prerequisite: PHY 105.

SOC 101	Human Relations	2	0	0	2

Development of understanding of relationships to other persons through some of the basic principles of human psychology. The problems of the individual and his work situation are studied in relation to the established organization of modern business and industry and in relation to government practices and labor organization, with special emphasis on the operating responsibilities of good management.
Prerequisite: None

MECH 112	Welding	0	0	3	1

Welding demonstrations by the instructor and practice by students in the welding shop. Safe and correct methods of assembling and operating the welding equipment. Practice will be given for surface welding; bronze welding, silver-soldering, and flame cutting methods applicable to mechanical repair work.
Prerequisite: None.

PHY 106 Applied Physics III	1	2	0	2

Physical principles of force, energy, work and power; equilibrium and the laws of motion; principles of machines, mechanical advantage, and transmission of power in practical applications and the use of vectors and graphical presentations.
Prerequisites: PHY 104, MA 120.

FOURTH QUARTER

AUTO 124 Automotive Power Train Systems	3	0	9	6

Principles and functions of automotive power train systems: clutches, transmission gears, torque converters, drive shaft assemblies, rear axles and differentials. Identification of troubles, servicing, and repair.
Prerequisites: PHY 105, PHY 106, AUTO 123.

SOC 103 Management Procedures	3	0	0	3

An introduction to the business world, problems of small business operation, basic business law, business forms and records, financial problems, ordering and inventorying, layout of equipment and offices, methods of improving business, and employer-employee relations.
Prerequisite: None.

AUTO 125 Automotive Servicing	3	0	9	6

Emphasis is on the shop procedures necessary in determining the nature of troubles developed in the various component systems of the automobile. Troubleshooting of automotive systems, providing a full range of testing, adjusting, repairing and replacing experiences.
Prerequisite: AUTO 123.

CARPENTRY

INTRODUCTION

Purpose of Curriculum

This curriculum provides a two-year training program for the instruction of students in the basic knowledge and skills involved in the use of hand and power tools, in commercial and residential types of construction, and related trades. Stress is laid on good work habits in acquiring both skill and craftsmanship. (Good working relationships with members of related trades are also stressed.) Students will be presented a variety of experiences and problems such as are encountered in the trade.

Along with other construction type jobs, the carpentry field is facing a critical shortage of skilled craftsmen. The ever increasing volume of construction is creating more job opportunities than can be filled with qualified young men. This presents a wonderful opportunity to those individuals willing to apply themselves and learn the trade.

The construction industry, directly and indirectly, employs 15 per cent of the U. S. labor force. Construction is America's largest industry and is a major contributor to our national economy. The construction industry is, in addition, a vital component of our national defense.

This course of study was developed to enable students to learn the basic principles necessary to become a carpenter. It is anticipated, however, that some on-the-job experience as a carpenter will be necessary before full development of skills takes place.

Job Description

The carpenter will generally perform general work involved in erecting wooden building frames, installing exterior and interior trim, laying floors, building concrete forms, pouring chutes, wooden scaffolds, and similar work requiring the cutting, shaping, and fastening together of wood or material, such as fiberboard, that is treated and used the same as wood.

Entrance Requirements

The applicant must have completed the tenth grade or must establish the equivalency as to quality and quantity of achievement in education. He must score acceptably on the General Aptitude Test Battery administered by the Employment Security Commission of North Carolina or other acceptable test instruments and must show an earnest desire to enter the subject field. An applicant may be tested by the Center in such areas as native ability, interest patterns, aptitudes, and traits as the Center finds need.

CARPENTRY

SUGGESTED CURRICULUM BY QUARTERS

Course Title			Course Hours Per Week		Quarter Hours Credit
FIRST QUARTER			Class	Shop Prac.	
CA	121	Hand Tools & Shop Procedures	5	10	8
MA	111	Math for Carpenters	5	0	5
ENG	101	Reading Improvement	2	0	2
DD	120	Building Trade and Blue Print Reading	5	0	5
			17	10	20
SECOND QUARTER					
CA	123	Power Tools, Use & Care	5	10	8
MA	124	Algebra	5	0	5
ENG	102	Communication Skills	2	0	2
DD	121	Blue Print Reading & Sketching	5	0	5
			17	10	20
THIRD QUARTER					
CA	124	House Construction Measurements	5	10	8
MA	121	Applied Geometry	3	0	3
CA	130	Materials of Construction	3	2	4
			11	12	15
FOURTH QUARTER					
CA	125	Structural Carpentry (Residential)	2	39	15
			2	39	15

FIFTH QUARTER

CA	126	Construction & Layout I	2	10	4
CA	127	Structural Carpentry Residential	1	10	4
SOC	101	Human Relations	2	0	2
			5	20	10

SIXTH QUARTER

CA	127	Construction and Layout II	2	15	7
CA	128	Estimating & Specifications	5	3	6
SOC	103	Management Procedures	3	0	3
			10	18	16

SEVENTH QUARTER

CA	129	Structural Carpentry, Commercial I	2	15	7
CA	130	Specifications & Contracts	3	0	3
CA	131	Related Trade Analysis	2	0	2
			7	15	12

EIGHTH QUARTER

CA	132	Structural Carpentry, Commercial II	2	39	15
			2	39	15

CARPENTRY

COURSE DESCRIPTIONS BY QUARTERS

Course Title		Course Hours Per Week		Quarter Hours
FIRST QUARTER		Class	Shop Prac.	Credit
CA 121	Hand Tools & Shop Practice	5	10	8

The student is oriented to shop theory and safe practices in the handling of tools and materials. Use and care of basic hand tools is stressed to develop skill in layout and making of joints, squaring, mitering, and standard measuring devices.

MA 111	Math for Carpenters	5	0	5

A review of fundamental arithmetic operations with special trade applications; common and decimal fractions; decimal equivalents, and percentage.

ENG 101	Reading Improvement	2	0	2

A concentrated effort to improve the student's ability to comprehend what he reads by training him to read more rapidly and accurately. Special machines are used for class drill to broaden the span of recognition, to increase eye coordination and word group recognition, and to train for comprehension in larger units. Reading faults of the individual are analyzed for improvement, and principles of vocabulary building are stressed.

DD 120	Building Trade and Blue Print Reading	5	0	5

Principles of interpreting blue prints and trade specifications common to the building trades. Development of proficiency in making three view and pictorial sketches.

SECOND QUARTER				
CA 123	Power Tools, Use & Care	5	10	8

The student is introduced to the use of power tools, emphasizing safe practices and proper maintenance of the various standard tools used in the trade. Practice with the power tools in making various projects is stressed during the course.

MA 124	Algebra	5	0	5

Basic concepts and operations of algebra: historical background of our base-10 number system; algebraic operations: addition, subtraction, multiplication and division; fractions, letter representation, grouping, factoring,

ratio and proportions, variation; graphical and algebraic solution of first degree equations.

ENG	102 Communication Skills	2	0	2

Development of ability to communicate effectively through the medium of good language usage in speaking and writing. Organizing thoughts, and presenting thoughts effectively in connection with problems.

DD	121 Blue Print Reading and Sketching	5	0	5

Development of the student's understanding and practical reading skill of both residential and commercial prints with practice in material takeoffs, shop detail sketches and recognition of related trade areas.

THIRD QUARTER

CA	124 House Construction Measurements	5	10	8

Introduction to the basic parts of a house: framing, sills, joists, rafters, sheathing, subflooring and roof covering. Standard measurement practices are stressed.

MA	121 Applied Geometry	3	0	3

Geometric forms and construction; applied problems in surface and volume computation.

CA	130 Materials of Construction	3	2	4

A study of the materials used in the construction trade, with emphasis on feasibility, strength, durability, availability, and cost.

FOURTH QUARTER

CA	125 Structural Carpentry (Res.) I	2	39	15

During this quarter all students will be placed on a job, as a carpenter's helper. Two hours per week will be devoted to classroom instruction relative to problems encountered from work experience. The instructor will visit and supervise students on the job and plan experiences needed to reach objectives of the program.

FIFTH QUARTER

CA	126	Construction & Layout I	2	10	4

Introduction and practice is given in the preparation of the building site, laying out the building, erection of batter boards and forms, and pouring of footings; construction of foundation walls. The student receives instruction and practice in placement and securing of sills, joists, and headers, cross-bracing and sub-flooring. Termite shields and ground treatment are included.

CA	127	Structural Carpentry (Res.) II	1	10	4

On-the-job construction in all phases of residential construction, some painting, sheet rocking, finishing, and trim work.

SOC	101	Human Relations	2	0	2

Development of understanding of relationships to other persons through some of the basic principles of human psychology. The problems of the individual and his work situation are studied in relation to the established organization of modern business and industry and in relation to government practices and labor organization, with special emphasis on the operating responsibilities of good management.

SIXTH QUARTER

CA	127	Construction & Layout II	2	15	7

Instruction and practice is given in wall construction, window and door framing, plumbing walls, layout and cutting of rafters for common types of roofs.

CA	128	Estimating & Specifications	5	3	6

Using take-offs from residential and commercial prints to figure material costs, computing of labor time and cost estimates, preparation of subcontract allowances.

SOC	103	Management Procedures	3	0	3

Development of procedures to familiarize the prospective contractor with the many important functions that must be carried on in the operations of a small business or enterprise. An introduction to the business world; problems of small business operation; basic business law, forms, and records; financial, ordering, and inventory problems; layout of equipment and offices; and methods of improving business and employer-employee relations.

SEVENTH QUARTER

CA	129	Structural Carpentry, Commercial I	2	15	7

Practice in various phases of commercial types of construction; rough and finish installations.

CA	130	Specifications and Contracts	3	0	3

Use of various research materials to study standard procedures in writing specifications. Contract and subcontract forms are studied.

CA	131	Related Trade Analysis	2	0	2

A study of the construction trade operation in conjunction with the carpentry trade. The inter-relationships with the duites of the carpenter are studied, stressing close cooperation.

EIGHTH QUARTER

CA	132	Structural Carpentry, Commercial II	2	39	15

During this quarter all students will be placed on a commercial building project, as an apprentice-carpenter. Two hours per week will be devoted to classroom instruction relative to problems encountered from work experience. The instructor will visit and supervise students on the job, and plan experiences needed to reach objectives of the program.

ELECTRICAL INSTALLATION AND MAINTENANCE

INTRODUCTION

Purpose of the Curriculum

The rapid expansion of the national economy and the increasing development of new electrical products is providing a growing need for qualified people to install and maintain electrical equipment. By mid-1960 more than 350,000 were employed as either construction electricians or maintenance electricians. Between 5,000 and 10,000 additional tradesmen are required each year to replace those leaving the industry. It is expected that the total requirements for electrical tradesmen will reach 500,000 by 1965, and 700,000 by 1970. The majority of the electrical tradesmen today are trained through apprenticeship or on-the-job training programs.

This curriculum guide will provide a training program in the basic knowledge, fundamentals, and practices involved in the electrical trades. A large portion of the program is devoted to laboratory and shop instruction which is designed to give the student practical knowledge and application experience in the fundamentals taught in class.

Job Description and Requirements

The graduate of the electrical trades program will be qualified to enter an electrical trade as an on-the-job trainee or apprentice, where he will assist in the planning, layout, installation, checkout, and maintenance of systems in residential, commercial, or industrial plants. He will have an understanding of the fundamentals of the National Electrical Code regulations as related to wiring installations, electrical circuits, and the measurements of voltage, current, power, and power factor of single and polyphase alternating circuits. He will have a basic knowledge of motor and motor control systems; industrial electronic control systems; business procedures, organization, and practices; communicative skills; and the necessary background to be able to advance through experience and additional training through up-grading courses offered in the center.

ELECTRICAL INSTALLATION AND MAINTENANCE

SUGGESTED CURRICULUM BY QUARTERS

Course Title			Course Hours Per Week			Quarte Hours Credit
FIRST QUARTER			Class	Lab.	Shop Prac.	
MA	125	Electrical Math	5	0	0	5
ELEC	122	Direct and Alternating Current	7	8	3	12
ENG	101	Reading Improvement	2	0	0	2
			14	8	3	19
SECOND QUARTER						
ELEC	123	Alternating Current & Direct Current Machines & Controls	5	10	0	10
DD	120	Building Trades Blue Print Reading and Sketching	5	0	0	5
ENG	102	Communication Skills	2	0	0	2
SOC	101	Human Relations	2	0	0	2
			14	10	0	19
THIRD QUARTER						
ELEC	124	Residential Wiring	5	0	9	10
ELN	118	Industrial Electronics 1	4	4	0	6
SOC	103	Management Procedures				
		or				
1Sc	102	Industrial Organizations	3	0	0	3
			12	4	9	17
FOURTH QUARTER						
ELEC	125	Commercial and Industrial Wiring	5	0	9	8
ELN	119	Industrial Electronics II	5	6	0	8
			10	6	9	16

COURSE DESCRIPTION BY QUARTERS

FIRST QUARTER	Course Hours Per Week: Class	Lab.	Shop Prac.	Quarter Hours Credit
MA 125 Electrical Math	5	0	0	5

A study of fundamental concepts of algebra; basic operations of addition, subtraction, multiplication, and division; solution of first order equations, use of letters and signs, grouping, factoring, exponents, ratios, and proportions; solution of equations, algebraically and graphically, a study of logarithms and use of tables; an introduction to trigonometric functions and their application to right angles; and a study of vectors for use in alternating current.
Prerequisite: None.

ELEC 122 Direct and Alternating Current	7	8	3	12

A study of the electrical structure of matter and electron theory, the relationship between voltage, current, and resistance in series, parallel, and series-parallel circuits. An analysis of direct current circuits by Ohm's Law and Kirchhoff's Law. A study of the sources of direct current voltage potentials. Fundamental concepts of alternating current flow, reactance, impedance, phase angle, power, and resonance. Analysis of alternating current circuits.
Prerequisite: None.

ENG 101 Reading Improvement	2	0	0	2

A concentrated effort to improve the student's ability to comprehend what he reads by training him to read more rapidly and accurately. Special machines are used for class drill to broaden the span of recognition, to increase eye coordination and word group recognition, and to train for comprehension in larger units. Reading faults of the individual are analyzed for improvement, and the principles of vocabulary building are stressed.
Prerequisite: None.

SECOND QUARTER				
ELEC 123 Alternating Current & Direct Current Machines & Controls	5	10	0	10

Privides fundamental concepts in single and polyphase alternating current circuits, voltages, currents, power measurements, transformers, and motors. Instruction in the use of electrical test instruments in circuit analysis. The basic concepts of Ac and DC machines and simple system controls. An introduction to the type control used in small appliances, such as: thermostats, times, or sequencing switches.
Prerequisite: ELEC 122, MA 125.

DD 120 Building Trades Blue Print Reading and Sketching	5	0	0	5

Principles of interpreting blue prints and trade specifications common to the building trades. Development of proficiency in making three view and pictorial sketches.
Prerequisite: None.

ENG 102 Communication Skills	2	0	0	2

Development of the ability to communicate effectively with other individuals through the medium of good language usage in speaking and writing, to think more clearly, and to reason more forcefully in work problems pertaining to his job.
Prerequisite: None.

SOC 101 Human Relations	2	0	0	2

Assistance in acquiring greater understanding of relations with other people through learning and applying some of the basic principles of human psychology. A study of the problems of the individual and his work situation in relation to the established organization of modern business and industry and in relation to government practices and labor organizations, with special emphasis on the operating responsibilities of good management.
Prerequisite: None.

THIRD QUARTER

ELEC 124 Residential Wiring	5	0	9	8

Provides instruction and application in the fundamentals of blue print reading, planning, layout, and installation of wiring in residential applications, such as: services, switch boards, lighting, fusing, wire sizes, branch circuits, conduits, National Electrical Code regulations in actual building mock-ups.
Prerequisites: ELEC 123, DD 120.

ELN 118 Industrial Electronics I	4	4	0	6

Basic theory, operating characteristics, and application of vacuum tubes, such as: diodes, triodes, tetrodes, pentodes, and gaseous control tubes. An introduction to amplifiers using triodes, power supplies using diodes, and other basic applications.
Prerequisite: ELEC 123.

SOC 103	Management Procedures	3	0	0	3

Development of procedures to familiarize the prospective businessman withe the many important functions that must be carried on in the operation of a small business or enterprise. An introduction to the business world; problems of small business operation; basic business law, forms, and records; financial, ordering, and inventory problems; layout of equipment and offices; and methods of improving business and employer-employee relations.
Prerequisite: None.

ISc 102	Industrial Organizations	3	0	0	3

FOURTH QUARTER

ELEC 125	Commercial and Industrial Wiring	5	0	9	8

Layout, planning, and installation of wiring systems in commercial and industrial complexes, with emphasis upon blue print reading and symbols, the related National Electrical Codes, and the application of the fundamentals to practical experience in wiring, conduit preparation, and installation of simple systems.
Prerequisite: ELN 118, ELEC 124.

ELN 119 Industrial Electronics II

Basic industrial electronic systems, such as: motor controls, alarm systems, heating systems and controls, magnetic amplifier controls, welding control systems using thyratron tubes, and other basic types of systems commonly found in most industries.
Prerequisite: ELN 118.

HEATING, AIR CONDITIONING, AND REFRIGERATION

INTRODUCTION

Purpose of Curriculum

This curriculum guide provides a training program for the instruction of students in the basic knowledges and skills involved in servicing and installing heating, air conditioning and refrigeration equipment. Manual skills are emphasized in practical shop work combined with a thorough understanding of the operating principles involved in heating, air conditioning and refrigeration.

The heating, cir conditioning and refrigeration industry is one of the fastest growing fields today. With the ever-increasing use of air conditioning in industries and the even faster growing use of air conditioning and heating systems in domestic use, the need for service people to install and maintain this equipment has surpassed the available supply of trained personnel. This need for trained people has become so great that a program for training is necessary. Because of the increasing engineering complexity units, a curriculum to train people and to upgrade present-day servicemen is being presented in this publication.

The objective in preparing this curriculum guide was to prepare a program of study to train people for the servicing of heating, air conditioning and refrigeration equipment. This program will provide the serviceman with the basic experience and the theoretical knowledge that will enable him to become an efficient workman in a rather limited time.

In North Carolina a contractor in the heating, air conditioning and refrigeration field is required by law to hold a state license if his work is done in cities of over 10,000 population. The serviceman or mechanic is not required to hold a license. The material presented herein is basic to the passing of this state's license examination. With job experience, a graduate should be able to successfully pass the examination and acquire a contractor's license.

Job Description

The heating, air conditioning and refrigeration mechanic installs, services and repairs equipment used in the heating and cooling of domestic buildings, industrial buildings and mobile-type units. In general, a person will perform similar duties in any one of these fields, but often becomes a specialist in one. The mechanic uses blue prints and schematics, thus requiring a knowledge of blue print reading. He services, installs and maintains commercial and domestic refrigeration components, heating devices, air and liquid flow devices used in comfort heating of air and liquids, and fuel storage units. The duties may involve mechanical repairs, electrical motor repairs, control wiring, electrical and gas tests, pipe and tubing fitting, duct and fitting fabrication, equipment installation, shop sketching of equipment and flow devices for installations, and equipment sizing.

HEATING, AIR CONDITIONING, AND REFRIGERATION

SUGGESTED CURRICULUM BY QUARTERS

	Course Title	Course Hours Per Week			Quarter Hours Credit
FIRST QUARTER		Class	Lab.	Shop Prac.	
AHR 102	Elements of Refrigeration I	3	0	3	4
PHY 105	Applied Physics II	1	2	0	2
DD 107	Blue Print Reading and Sketching I	2	0	0	2
MA 102	Algebra I	4	0	0	4
		10	2	3	12
SECOND QUARTER					
AHR 103	Elements of Refrigeration II	2	0	6	4
ELEC 101	Applied Electricity	2	0	0	2
DD 116	Applied Drafting I	2	0	0	2
MA 101	Plane and Solid Geometry	3	0	0	3
		9	0	6	11
THIRD QUARTER					
AHR 104	Domestic Refrigeration	3	0	6	5
ELEC 102	Applied Electricity	1	2	0	2
DD 117	Applied Drafting II	3	0	0	3
		7	2	6	10
FOURTH QUARTER					
AHR 105	Installation and Service of Commercial Refrigeration	4	0	6	6
MECH 112	Welding	0	0	3	1
AHR 106	Calculations of Heat Loads	2	0	0	2
		6	0	9	9

FIFTH QUARTER

AHR	109	Estimating for Refrigeration and Cooling	3	0	0	3
MECH	117	Elements of Sheet Metal	2	0	6	4
AHR	108	Principles of Air Condioning	4	0	0	4
			9	0	6	11

SIXTH QUARTER

AHR	111	Automatic Controls	5	0	0	5
MECH	118	Duct and Fitting Fabrication	4	0	6	6
			9	0	6	11

SEVENTH QUARTER

AHR	113	Calculation of Heat Loss	3	0	0	3
AHR	116	Oil Burner Installation and Service	4	0	6	6
SOC	104	Sales and Communications	2	0	0	2
			9	0	6	11

EIGHTH QUARTER

AHR	117	Gas Burners, Electric Heat and Liquid Heat Applications	4	0	6	6
AHR	115	Estimating of Systems Installation	2	0	0	2
SOC	103	Management Procedures	3	0	0	3
			9	0	6	11

HEATING, AIR CONDITIONING AND REFRIGERATION

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER	Course Hours Per Week			Quarter Hours Credit
	Class	Lab.	Shop Prac.	
AHR 102 Elements of Refrigeration	3	0	3	4

Essential terminology, laws of refrigeration, heat and the methods of heat transfer, the compression system, use and care of tools and equipment, tubing and fittings. Practice will be given in basic refrigeration jobs such as tube bending, flaring, swaging, identification of fittings, soldering and use of basic test equipment.

PHY 105 Applied Physics II	1	2	0	2

Basic principles of electricity, types of electricity, and its production, transmission, and transformation. Such factors as the electron theory, electrical measurement, magnetism, electromagnetism, and the magnetic effects of electricity constitute major areas of study.

DD 107 Blue Print Reading and Sketching I	2	0	0	2

Interpretation and reading of blue prints used by industry. Information on the basic principles of the blue print; lines, views, dimensioning procedures and notes.

MA 102 Algebra I	4	0	0	4

Algebra I is designed to acquaint the student with the fundamental concepts and operations of basic algebra. The historical background and evolution of the nember system is introduced and related to its present-day use. Basic operations of addition, subtraction, multiplication, and division are covered in depth and related to the solution of various algebraic functions. Considerable time is spent in the solution of simple first order equations, use of letters and signs, grouping factoring, exponents, and the setting up of ratios, proportions, and variations. Those laws, axioms, and postulates, relative to basic algebra are stated and discussed in detail.

SECOND QUARTER				
AHR 103 Elements of Refrigeration II	2	0	6	4

Compressors and their construction, refrigerant controls, temperature controls, refrigerants and characteristics, pressure temperature relationship, use of special test and service equipment, vacuum pumps and micron gages.

ELEC	101 Applied Electricity	2	0	0	2

The use and care of electrical test instruments and equipment used in servicing refrigeration equipment electrical apparatus. Meter principles and procedures for using meters in trouble-shooting will be included.

DD	116 Applied Drafting I	2	0	0	2

The study of blue prints used in the refrigeration and air conditioning trade; blue prints of mechanical parts, assembly drawings, wiring diagrams and schematics, building plans, and shop sketches and drawings.

MA	101 Plane and Solid Geometry	3	0	0	3

The student will be given the patterns of traditional geometric concepts in a new approach by developing the normally innate abilities of the individual to visualize spatial relations. The patterns of logical proof of geometric ideas and relationships will receive some attention, but grouped into somewhat more practical arrangements for purposes of the draftsman.

THIRD QUARTER

AHR	104 Domestic Refrigeration	3	0	6	5

Refrigeration service practice on domestic refrigeration systems using conventional, hermetic, and absorption systesm. Cabinet care, controls, system maintenance, and system replacement will be stressed. Typical service problems will be solved by each student. Complete re-building of domestic refrigerators, including cabinet refinishing, will be undertaken.

ELEC	102 Applied Electricity	1	2	0	2

The study of the various electrical devices used in air conditioning and heating equipment. Included will be transformers, various types of motors and starting devices, switches, electrical heating devices and wiring.

DD	117 Applied Drafting II	3	0	0	3

A specialized course in drafting for the heating, air conditioning and refrigeration students. Emphasis will be placed on reading of blue prints that are common to the trade; floor plans, heating system plans, including ducts, equipment layout plans, and wiring schematics. The student will learn to make tracings of floor plans and to lay out heating systems.

FOURTH QUARTER

AHR 105	Installation and Service of Commercial Refrigeration	4	0	6	6

Commercial systems both conventional and hermetic including accessories, condensers, coils, control valves, methods of installation, procedure for removal and repair of components, and an introduction to methods of trouble-shooting are the emphasis of this course.

MECH 112	Welding	0	0	3	1

Demonstration by the instructor and practice by student in the welding shop. Safe and correct methods of assembling and operating the welding outfit will be emphasized. Practice will be given in surface welding, bronze welding, silver brazing and flame cutting methods applicable to mechanical repair work.

AHR 106	Calculations of Heat Loads	2	0	0	2

Practice in computing system loads, equipment sizing and balancing, and the use of charts and tables pertaining to refrigeration equipment.

FIFTH QUARTER

AHR 109	Estimating for Refrigeration and Cooling	3	0	0	3

Practices in time and material take-off from job drawings and specifications are studied. Methods of calculating overhead and other operating costs are discussed and their relationship to labor and material cost is considered in preparing true-cost estimates. The student will prepare true-cost estimates of refrigeration and cooling systems.

MECH 117	Elements of Sheet Metal	2	0	6	4

An introductory course in sheet metal fabrication. Safety, sheet metal hand tools, cutting and shaping machines, fastening, fabrication methods, layout methods, and development of duct systems are studied and fabricated. Properties of the various types of sheet metal will be included.

AHR 108	Principles of Air Conditioning	4	0	0	4

The history, theory, and factors covering air conditioning are studied. Instruction will include air conditioning terminology, temperature measurement, air movement, humidity, psychometric properties, comfort zone, effective temperature, duct systems, air diffusion, air cleaning zone, testing instruments and heat loads.

SIXTH QUARTER

AHR 111 Automatic Controls	5	0	0	5

Types of automatic controls and their function in air conditioning systems. Included in the course will be electric and pneumatic controls for domestic and commercial cooling and heating; zone controls, unit heater and ventilator controls, commercial fan system controls, commercial refrigeration controls, and radiant panel controls.

MECH 118 Duct and Fitting Fabrication	4	0	6	6

Practice in fabrication of duct systems for air conditioning and heating systems. The student will lay out, develop, fabricate and install complete duct systems under practical working conditions. Classroom instruction will include methods of developing and planning of systems layout.

SEVENTH QUARTER

AHR 113 Calculations of Heat Loss	3	0	0	3

Heat distribution by air and liquid systems are considered in the study of heat loss. Types of structures are studied in respect to heat loss factors and methods of calculating heat load needs for the various types of structures is presented. Heat loss will be calculated and systems will be selected for various buildings.

AHE 116 Oil Burner Installation and Service	4	0	6	6

The study of practices in servicing and installing oil-fired heating equipment. The various types of burners and their methods of operation, methods of installation and methods of servicing will be studied. Fuel types, methods of preparing fuels for combustion, and storage will be covered. Practice will be given in servicing of this equipment and their controls under typical working conditions.

SOC 104 Sales and Communications	2	0	0	2

A course to improve the serviceman's ability to communicate more effectively. Instruction will be given in preparing reports, communications principles, and salesmanship.

EIGHTH QUARTER

AHR 117	Gas Burners, Electric Heat, and Liquid Heat Applications	4	0	6	6

The student studies and receives practice in servicing and installing gas burners, electric heating elements and controls. The applications of various heating devices in liquid heating and controls are studied. Basic principles of installing hot water and low pressure steam boiler controls, pumps, and coils are covered and installations using this equipment are made.

AHR 115	Estimating of Systems Installation	2	0	0	2

Practical exercises in estimating for the student to gain experience. The student will prepare estimates and submit bids on projects involving the major types of heating and air-conditioning systems used in domestic and commercial buildings.

SOC 103	Management Procedures	3	0	0	3

Management procedures is developed to familiarize the prospective businessman with the many important functions that must be carried on in the operation of a small business or enterprise. An introduction to the business world, problems of small business operation, basic business law, business forms and records, financial problems, ordering and inventorying, layout of equipment and offices, methods of improving business, and employer-employee relations are some of the submects studied.

MACHINIST TRADE

INTRODUCTION

Purpose of Curriculum

This curriculum was prepared to meet a definite need for training of machinists. Surveys recently completed in North Carolina show that many of the existing industries lack time and facilities for training enough machinists to meet present and planned needs. Expanding industries already located in our State, and new industries under development, invariably express the need for skilled craftsmen who have the background knowledge and potential to advance.

This guide is designed to give learners the opportunity to acquire basic skills and the related technical information necessary to gain employment and build a profitable career in the machine shop industry in the State. It is comprised of the joint views of committees responsible for its development.

Job Description

The machinist is a skilled metal worker who shapes metal parts by using machine tools and hand tools. His training and experience enable him to plan and carry through all the operations needed in turning out a machined product and to switch readily from one kind of product to another. A machinist is able to select the proper tools and material required for each job and to plan the cutting and finishing operations in their proper order so that he can complete the finished work according to blue print or written specifications. He makes standard shop computations relating to dimensions of work, tooling, feeds, and speeds of machining. He often uses precision measuring instruments such as micrometers and gages to measure the accuracy of his work to thousandths of an inch.

This skilled worker must be able to set up and operate most types of machine tools. The machinist also must know the composition of metals so that he can heat and quench cutting tools and parts to improve machinability. His wide knowledge enables him to turn a block of metal into an intricate, precise part.

MACHINIST TRADE

SUGGESTED CURRICULUM BY QUARTERS

Course Title			Course Hours Per Week			Qua Hou Cre
FIRST QUARTER			Class	Lab.	Shop Prac.	
MECH	121	Machine Shop Theory and Practice	3	0	12	7
MA	120	Fundamentals of Mathematics	5	0	0	5
DD	122	Blue Print Reading	5	0	0	5
ENG	101	Communicative Skills: Reading Improvement	2	0	0	2
			15	0	12	19
SECOND QUARTER						
MECH	122	Machine Shop Theory and Practice	3	0	12	7
MA	123	Machinist Mathematics	5	0	0	5
DD	123	Blue Print Reading	3	0	0	3
PHY	104	Applied Physics I	1	2	0	2
ENG	102	Communicative Skills: English	2	0	0	2
			14	2	12	19
THIRD QUARTER						
MECH	123	Machine Shop Theory and Practice	3	0	12	7
MECH	123	Structure of Metals	3	2	0	4
PHY	105	Applied Physics II	1	2	0	2
SOC	101	Human Relations	2	0	0	2
			9	4	12	15
FOURTH QUARTER						
MECH	125	Machine Shop Theory and Practice	3	0	12	7
ISC	101	Industrial Specifications	2	0	0	2
MECH	111	Oxyacetylene Welding	2	0	3	3
MECH	126	Heat Treating Practice	0	0	3	1
ISC	102	Industrial Organizations	3	0	0	3
			10	0	18	16

MACHINIST TRADE

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER	Course Hours Per Week			Quarter Hours Credit
	Class	Lab.	Shop Prac.	
MECH 121 Machine Shop Theory and Practice	3	0	12	7

An introduction to the machinist trade and the potential it holds for the craftsman. Deals primarily with the identification, care and use of basic hand tools and precision measuring instruments. Elementary layout procedures and processes of lathe, drill press, grinding (off-hand) and milling machines will be introduced both in theory and practice.
Prerequisite: None.

MA 120 Fundamentals of Mathematics	5	0	0	5

Practical number theory. Analysis of basic operations: addition, subtraction, multiplication and division. Fractions, decimals, powers and roote, percentages, ratio and proportion. Plane and solid geometric figures used in industry; measurement of surfaces and volumes. Introduction to algebra used in trades. Practice in depth.
Prerequisite: None.

DD 122 Blue Print Reading	5	0	0	5

Interpretation and reading of Blue Prints. Information on the basic principles of the Blue Print; lines, views, dimensioning procedures and notes.
Prerequisite: None

ENG 101 Reading Improvement	2	0	0	2

A concentrated effort to improve the student's ability to comprehend what he reads by training him to read more rapidly and accurately. Special machines are used for class drill to broaden the span of recognition, to increase eye coordination and word group recognition, and to train for comprehension in larger units. Reading faults of the individual are analyzed for improvement, and principles of vocabulary building are stressed.
Prerequisite: None.

SECOND QUARTER

MECH	122	Machine Shop Theory and Practice	3	0	12	7

Advanced operations in layout tools and procedures, power sawing, drill press, surface grinder, milling machine and shaper. The student will be introduced to the basic operations on the cylindrical grinder and will select projects encompassing all the operations, tools and procedures thus far used and those to be stressed throughout the course.
Prerequisite: MECH 121.

MA	123	Machinist Mathematics	5	0	0	5

Fundamental geometric concepts and construction of plane and solid figures, surface and volume measurements, and related problems; introduction to trigonometry of the right triangle. Introduces gear ratio, lead screw and indexing problems with emphasis on application to the machine shop. Practical applications and problems furnish the trainee with experience in geometric propositions and trigonometric relations to shop problems; concludes with an introduction to compound angle problems.
Prerequisite: MA 120.

DD	123	Blue Print Reading	3	0	0	3

Further practice in interpretation of Blue Prints as they are used in industry; study of prints supplied by industry; making plans of operations; introduction to drafting room procedures; sketching as a means of passing on ideas, information and processes.
Prerequisite: DD 122.

PHY	104	Applied Physics I	1	2	0	2

Introductory physics and its applications. Systems of measurement, theory of matter, properties of solids, liquids, and gases.
Prerequisite: None.

ENG	102	Communication Skills	2	0	0	2

Development of ability to communicate effectively through the medium of good language usage in speaking and writing. Organizing thoughts, and presenting thoughts effectively in connection with problems.
Prerequisite: None.

THIRD QUARTER

MECH 123 Machine Shop Theory and Practice	3	0	12	7

Advanced work on the engine lathe, turning, boring and threading machines, grinders, milling machine and shaper. Introduction to basic indexing and terminology with additional processes on calculating, cutting and measuring of spur, helical, and worm gears and wheels. The trainee will use precision tools and measuring instruments such as vernier height gages, protractors, comparators, etc. Basic exercises will be given on the turret lathe and on the tool and cutter grinder.
Prerequisites MECH 121, MECH 122

MECH 124 Structure of Metals	3	2	0	4

Elementary and practical approach to metals, their structure, markings, classifications and uses. Interpretation of properties and specifications of steels by use of manuals, catalogs, charts, etc.
Prerequisite: None.

PHY 105 Applied Physics II	1	2	0	2

Basic principles of electricity, types of electricity, and its production, transmission, and transformation. Such factors as the electron theory, electrical measurement, magnetism, electromagnetism, and the magnetic effects of electricity constitute major areas of study.
Prerequisite: PHY 104.

SOC 101 Human Relations	2	0	0	2

Development of understanding of relationships to other persons through some of the basic principles of human psychology. The problems of the individual and his work situation are studied in relation to the established organization of modern business and industry and in relation to government practices and labor organization, with special emphasis on the operating responsibilities of good management.
Prerequisite: None.

FOURTH QUARTER

MECH 125 Machine Shop Theory and Practice	3	0	12	7

Development of class projects using previously learned procedures in planning, blue print reading, machine operations, final assembly and inspection. Additional processes on the turret lathe, tool and cutter grinder,

cylindrical and surface grinder, advanced milling machine operations, etc. Special procedures and operations, processes and equipment, observing safety procedures faithfully and establishing of good work habits and attitudes acceptable to the industry.
Prerequisites: MECH 121, MECH 122, MECH 123.

1Sc 101	Industrial Specifications	2	0	0	2

Organizing and studying machine tool and hand tool specifications, job sheets and procedure sheets. Catalogs, specification sheets, and manufacturer' handbooks serve as reference sources.
Prerequisite: None.

MECH 111	Oxyacetylene Welding	2	0	3	3

Basic welding procedures and practice. The trainee will gain experience in the gas welding of small parts and tools. This course will present gas welding as it may be used by the machinist in the repair and manufacture of tools and equipment.
Prerequisite: None.

MECH 126	Heat Treating Practice	0	0	3	1

Working knowledge of the methods of treating ferrous and nonferrous metals. The effects of hardening, tempering, and annealing upon the structure and physical properties of metals. Trainees will be given the opportunity to acquaint themselves with the equipment and processes of heat treating.
Prerequisite: MECH 124.

1Sc 102	Industrial Organizations	3	0	0	3

Methods, techniques, and practices of modern management in planning, organizing and controlling operations of a manufacturing concern. Introduction to the competitive system and the factors constituting product cost.
Prerequisite: None.

TRADE PREPARATORY CURRICULUM

MASONRY

The demand and the necessity for shelter which is equaled only by the demand and necessity for food means that the masonry trade offers assurance of permanent employment. The masonry trade is, therefore, essential to the well-being and advancement of mankind.

This course is designed to prepare students who are vocationally competent to take their places in the labor market along with journeymen brickmasons. The length of this course is to be 4 quarters.

Any student accepted for this course should be capable of successfully completing the course and he should be able to progress on the job after employment. There should be a close mutual relationship between the school administration, and members of the Craft Committee for masonry work to assure adequate trade preparatory training to meet local needs in the masonry trade.

OBJECTIVES:

1. To develop within the student the correct habits and techniques of using all masonry tools, and of mixing mortar.

2. To develop work habits and to teach proper safety procedures the student will use in the trade.

3. To teach technical knowledge through related subjects as well as the manipulative skills in the masonry trade.

4. To present a variety of experiences and problems in order to develop the student's ability to cope with the practical problems which will be encountered in the trade.

MASONRY TRADE

SUGGESTED CURRICULUM BY QUARTERS

Course Title			Course Hours Per Week		Quarter Hours Credit
FIRST QUARTER			Class	Shop	
MAS	121	Shop Theory and Practice	4	10	7
MA	120	Fundamentals of Mathematics	5	0	5
DD	122	Blue Print Reading	5	0	5
			14	10	17
SECOND QUARTER					
MAS	122	Shop Theory and Practice	5	15	10
MA	121	Fundamentals of Mathematics	3	0	3
DD	123	Blue Print Reading	3	0	3
			11	15	16
THIRD QUARTER					
MAS	123	Shop Theory and Practice	3	20	10
SOC	101	Human Relations	2	0	2
			5	20	12
FOURTH QUARTER					
MAS	124	Shop Theory and Practice	3	20	10
SOC	103	Management Procedures	3	0	3
			6	20	13

MASONRY TRADE

COURSE DESCRIPTIONS

Course Title	Course Hours Per Week		Quarter Hours
FIRST QUARTER	Class	Shop Prac.	Credit
MAS 121 Shop Theory and Practice	4	10	7

This unit provides an introduction to the masonry trade. An introduction to the practical masonry tools is provided covering their identification, proper use, and care. The fundamentals of trowel manipulation in pick-up, spreading, furrowing, and cutting mortar will be taught. Shop practice is gained by working on 4" projects dealing with placing, racking, jambing and toothing of bricks. Safety will be emphasized in all shop instruction and practice.

MA 120 Fundamentals of Mathematics	5	0	5

Practical number theory. Analysis of basic operations: addition, subtraction, multiplication and division. Fractions, decimals, powers and roots, percentages, ratio and proportion. Plane and solid geometric figures used in industry; measurement of surfaces and volumes. Introduction to algebra used in trades. Practice in depth.

DD 122 Blue Print Reading	5	0	5

Interpretation and reading of blue prints. Information on the basic principles of the blue print; lines, views, dimensioning procedures and notes.

SECOND QUARTER			
MAS 122 Shop Theory and Practice	5	15	10

The student will construct block, brick veneer and block and brick, walls in the basic bonds. Additional practice in the making of 8" and 12" corner constructions and the continuous line drills will be provided. The layout of a building, the footings, the foundation walls, and the footing anchorage will be taught and practice given.

MA 121 Fundamentals of Mathematics	3	0	3

Fundamental properties and definitions; plane and solid geometric figures, selected general theorems, geometric construction of lines, angles and plane figures. Dihedral angles, areas of plane figures, volumes of solids. Geometric principles are applied to shop operations.

DD	123 Blue Print Reading	3	0	3

Further practice in interpretation of blue prints as they are used in industry; study of prints supplied by industry; making plans of operations; introduction to drafting room procedures; sketching as a means of passing on ideas, information and processes.

THIRD QUARTER

MAS	123 Shop Theory and Practice	3	20	10

Instruction and practice will be given the construction of veneer, cavity brick faced tile, and structural tile walls. The construction of arches and lintels, along with additional practice in building 16" and 12" corner leads and walls with door and window openings will be covered. Instruction and practice will be given in constructing block and corner leads with 4", 6", 8", and 12" concrete and cinder blocks.

SOC	101 Human Relations	2	0	2

Development of understanding of relationships to other persons through some of the basic principles of human psychology. The problems of the individual and his work situation are studied in relation to the established organization of modern business and industry and in relation to government practices and labor organization, with special emphasis on the operating responsibilities of good management.

FOURTH QUARTER

MAS	124 Shop Theory and Practice	3	20	10

After the information lessons on the following, the student will construct one or more fireplaces, mantels, chimneys, flues, glass block panels, steps, walkways, patios, and circular masonry work.

SOC	103 Management Procedures	3	0	3

An introduction to the business world, problems of small business operation, basic business law, business forms and records, financial problems, ordering and inventorying, layout of equipment and offices, methods of improving business, and employer-employee relations.

PAINTING AND PAPER-HANGING

INTRODUCTION

Purpose of Curriculum

It is generally understood that the complexities of the painting and paper-hanging industry, in this age, preclude a complete mastery of the trade, but a broad understanding of the basic principles, is essential. Unless the painter and paper-hanger knows the "whys" of his trade, he will be "adrift in a strange land". It is, therefore, the purpose of this curriculum to develop an understanding of principles, processes and procedures applicable to painters and paper-hangers. The curriculum provides time for practical application of principles learned, in order to develop skills necessary to enter the trade as an apprentice.

Job Description and Requirements

Painting and paperhanging are separate skilled building trades, although many craftsmen in these trades do both types of work. Painters prepare the surfaces of buildings and other structures and then apply paint, varnish, enamel, lacquer and similar materials to these surfaces. Paperhangers cover room interiors with paper, fabric, vinyls, or other materials.

One of the important duties of the painter, especially in repainting, is to prepare the surface. Loose paint must be removed by scraping or by heating with a blowtorch and then scraping. Grease must be removed, nail holes and cracks filled, rough spots sandpapered, and dust brushed off. Often, surfaces must be covered with a prime coat or sealer to provide a suitable surface or base on which to apply the new paint. Paint is applied to many kinds of materials, including wood, structural steel, and clay products, generally be means of a brush, spray gun, or roller.

A painter must be skilled in handling brushes and other painting tools, in order to apply paint thoroughly, uniformly, and rapidly to any type of surface. In addition, he must be able to mix paints, match colors, and must have a knowledge of color harmony. He must also know the characteristics of common types of paints and finishes from the standpoints of durability, suitability for different purposes, and ease of handling and application.

Painters must know how to erect the scaffolding from which they often work, including "swing stages" (scaffolds suspended by ropes or cables attached to roof hooks) and "bosun chairs" which are used to work on tall buildings and other structures.

Painters use spray guns to paint surfaces or objects which are difficult to paint with a brush such as lattices, cinder and concrete blocks, and radiators. They also use spray guns on large areas which can be sprayed with a minimum of preparation. When using a roller (a rotating applicator covered with a soft material), the painter rolls the applicator over the surface to be covered.

The paperhanger first prepares the surface to be covered. In new work, he applies "sizing", a prepared material which makes the plaster less porous and assures better sticking of the paper to the surface. In redecorating work, it may be necessary to remove old paper by soaking, or if there are many layers, by steaming. In many cases it is also necessary for paperhangers to do minor plaster patching, in order to get a smooth surface for the covering material.

When the surface has been prepared, the paperhanger measures the area to be covered and cuts the paper to size. He mixes a paste and applies it to the reverse side of the paper. The pastecoated paper is then placed on the wall or ceiling in strips and smoothed into place with a dry brush. The paperhanger matches the adjacent edges of strips of figured paper, cuts overlapping ends, and smooths the seams between strips with a roller or other special tool. When working with wall coverings other than paper, the paperhanger follows the same general procedure, except that he applies an adhesive other than paste.

PAINTING AND PAPER-HANGING

SUGGESTED CURRICULUM BY QUARTERS

			Course Hours Per Week			Quarter Hours
FIRST QUARTER			Class	Lab.	Shop Prac.	Credit
PD	101	Introduction to the Trade	1	0	0	1
ENG	101	Reading Improvement	2	0	0	2
MA	120	Fundamentals of Math	5	0	0	5
PD	102	Tools, Equipment and Safety	2	0	6	4
PD	103	Basic Preparatory and Application of Materials	2	0	10	7
			12	0	16	19
SECOND QUARTER						
PD	104	Color in Paint and Coating Materials	3	0	5	5
PD	105	Wood Finishes	2	0	5	4
PD	106	Specialty Finishes and Coatings	2	0	5	4
PD	107	Paper Hanging and Hanging of Specialty Materials	2	0	5	4
			9	0	20	17
THIRD QUARTER						
PD	108	Paper Hanging and Hanging of Specialty Materials	2	0	10	5
DD	120	Basic Blue Print Reading	2	3	0	3
PD	109	Industrial Painting	2	0	5	4
SOC	101	Human Relations	2	0	0	2
			8	3	15	14

FOURTH QUARTER

PD	111	Interior Decorating	3	0	15	8
PD	110	Estimating	5	0	2	6
SOC	103	Business Management	3	0	0	3
		Elective	3	0	0	3
			14	0	17	20

PAINTING AND PAPER-HANGING

COURSE DESCRIPTIONS BY QUARTERS

Course Title	Course Hours Per Week			Quarter Hours
FIRST QUARTER	Class	Lab.	Shop Prac.	Credit
PD 101 Introduction to the Trade	1	0	0	1

This course investigates the history of the painting and paper-hanging industry. An appreciation for the occupation in which a person is engaged will generally help him to become better qualified to fill his duties.

ENG 101 Reading Improvement	2	0	0	2

A concentrated effort to improve the student's ability to comprehend what he reads by training him to read more rapidly and accurately. Special machines are used for class drill to broaden the span of recognition, to increase eye coordination and word group recognition, and to train for comprehension in larger units. Reading faults of the individual are analyzed for improvement, and principles of vocabulary building are stressed.
Prerequisite: None.

MA 120 Fundamentals of Math	5	0	0	5

A study of the fundamental concepts of algebra, basic operations of addition, substraction, multiplication, and division; solutions of first order equations, use of letters and signs, exponents, ratios, and proportions; solution of simple equations. An introduction of geometry.

PD 102 Tools, Equipment and Safety	2	0	6	4

A study of tools and equipment of the trade. The apprentice who would become a skilled journeman must be able to determine the most efficient tool to use in a given situation, and he must be able to use that tool as it was designed to be used.

This course includes instruction in personal safety, not only as regards the use of otherwise safe equipment, but also in matters of personal cleanliness and healthful habits.

PD 103 Basic Preparation and Application of Materials	2	0	10	17

This course includes failures which occur in paint and coating films, preparation of materials for painting, and papering, and special attention to the preparation of plaster, masonry and concrete surfaces.

Attention is directed to the selection of the proper paints, and the preparation and application of paints.

SECOND QUARTER

PD	104 Color in Paint and Coating Materials	3	0	5	5

This course places emphasis on the basic theory of color and color harmony. The student will make a color wheel and become familiar with elaborate schemes for classifying colors. A study of systems devised to identify and analyze, and measure color will be included.

PD	105 Wood Finishes	2	0	5	4

This course includes study of the types of wood and their preservation, preparation and sanding, removing finish and refinishing, bleaching, staining. The use of filler, sealer, varnish, shellac, lacquer, wax, and oil for woods are included. Techniques of rubbing, polishing, buffing and repairing will be emphasized.

PD	106 Specialty Finishes and Coatings	2	0	5	4

Instruction includes experiences in marbleizing, graining, texturing, glazing, and antiquing; stenciling, striping and lining.

PD	107 Paper-Hanging and Hanging of Specialty Materials	2	0	5	4

This course is a study of preparation of surfaces, measuring, tools and equipment for the paper-hanger, adhesives and their application, and hanging standard papers. Special instruction regarding papering around windows and doors, and the use of fine papers, fabrics, and vinyls.

THIRD QUARTER

PD	108 Paper-Hanging and Hanging of Specialty Materials	2	0	10	5

This course is a continuation of PD 107.

DD	120 Basic Blue Print Reading	2	3	0	3

Principles of interpreting blue prints and trade specifications common to the building trades. Development of proficiency in making three view and pictorial sketches.

PD	109 Industrial Painting	2	0	5	4

This course deals with problems encountered in industrial painting not common to residential painting. The maximum utilization of equipment, labor

and materials is especially emphasized in this course.

SOC	101 Human Relations	2	0	0	2

Assistance in acquiring greater understanding of relation with other people through learning and applying some of the basic principles of human psychology. A study of the problems of the individual and his work situation in relation to the established organization of modern business and industry and in relation to government practices and labor organizations, with special emphasis on the operating responsibilities of good management.

FOURTH QUARTER

PD	111 Interior Decorating	3	0	15	8

Principles of interior decorating are emphasized, with regard to paints and wall coverings, to achieve both an artistic and functional effect. Paint and wall paper should produce the effect desired by the employer with relation to furniture, draperies, and floor coverings.

PD	110 Estimating	5	0	2	6

Problems in estimating, labor, and material in figuring small and large jobs.

SOC	103 Business Management	3	0	0	3

Development of procedures to familiarize the prospective businessman with the many important functions that must be carried on in the operations of a small business or enterprise. An introduction to the business world; problems of small business operation; basic business law, forms, and records; financial, ordering, and inventory problems; layout of equipment and offices; and methods of improving business and employer-employee relations.

Elective		3	0	0	3

An elective should be selected by the student that will contribute to his being a better craftsman.

PLUMBING

INTRODUCTION

Purpose of Curriculum

This curriculum is designed to prepare students to enter the field of plumbing. Each course is prepared to enable an individual to advance rapidly in the trade upon entering the field of work. Courses are arranged in sequence to develop plumbing skills and proficiency in related areas vital to the training of plumbers.

The plumber associates with many levels of personnel - administrative, draftsmen, engineers, skilled workers -- and must be able to communicate effectively with them. Courses to develop knowledge and skills in communication, human relations, economics and management procedures, are provided to assist the student in developing understandings and confidence in his relations with other.

Job Description

Plumbers are craftsmen who install pipe systems which carry water, steam, air, or other liquids or gases needed for sanitation, industrial production, or other uses. They also alter and reapir existing pipe systems, and install plumbing fixtures, appliances, and heating and refrigeration circuits.

Plumbers use a variety of skills when installing pipe systems. For example, they bend pipe and make welded, brazed, calked, soldered, or threaded joints. After a pipe system is installed, the plumber tests for leaks by filling the pipes with liquid or gas under pressure.

Earning and Employment Outlook

Employment of plumbers is expected to rise rapidly over the 1960-70 decade. This rapid increase in job opportunities is contributed to the rapid rise in construction activities locally and nationally.

Plumbing is expected to become more important in many types of construction. For example, the trend toward more bathrooms per dwelling unit is likely to continue. The installation of appliances, such as washing machines and waste disposals, which require plumbing work, will become more widespread.

Hourly wage rates for plumbers are among the highest in the skilled building trades, with minimum hourly wage rates for plumbers averaging $4.00 per hour. In Charlotte, N. C., plumber wage rates in 1960 was $3.25, per hour.

PLUMBING

SUGGESTED CURRICULUM BY QUARTERS

Course Title	Course Hours Per Week			Quarter Hours Credit
FIRST QUARTER	Class	Lab.	Shop Prac.	
ENG 101 Reading Improvement	2	0	0	2
MA 125 Math for Plumbers	5	0	0	5
Plumbing I	5	0	10	9
	12	0	10	16
SECOND QUARTER				
Estimating (Plumbing)	3	0	0	3
SOC 101 Human Relations	1	0	0	1
DD 120 Blue Print Reading	5	0	0	5
Plumbing II (Theory & Practice)	5	0	10	9
	14	0	10	18
THIRD QUARTER				
SOC 130 Management Procedure	3	0	0	3
Plumbing III (Theory and Practice)	5	0	10	9
Heating (Hot Water Systems)	3	0	0	3
Welding (Arc and Acetylene)	3	0	5	5
	14	0	15	20

PLUMBING

COURSE DESCRIPTIONS BY QUARTERS

Course Title	Course Hours Per Week			Quarter Hours
FIRST QUARTER	Class	Lab.	Shop Prac.	Credit
ENG 101 Reading Improvement	2	0	0	2

A concentrated effort to improve the student's ability to comprehend what he reads by training him to read more rapidly and accurately. Special machines are used for class drill to broaden the span of recognition, to increase eye coordination and word group recognition, and to train for comprehension in larger units. Reading faults of the individual, and principles of vocabulary building are stressed.
Prerequisite: None.

MA 125 Plumbing Math	5	0	0	5

A study of fundamental concepts of algebra; basic operations of addition, subtraction, multiplication, and division; solutions of first order equations, ratio and proportions, as they relate to the plumbing trade.

Plumbing I (Practice and Theory)	5	0	10	9

Introduction to the trade, tools and materials used in the trade, and concepts and principles of the design and installation of both private and municipal drainage and sewage systems.

SECOND QUARTER

Estimating (Plumbing Trade)	3	0	0	3

Concentrated effort is made to develop the student's ability to estimate material and labor needed for a particular job.

SOC 101 Human Relations	1	0	0	1

Assistance in acquiring greater understanding of relations with others through learning and applying some of the basic principles of human psychology. A study of the problems of the individual and his work situation in relation to the established organization of modern business and industry, and in relation to government practice and labor organizations, with special emphasis on the operating responsibilities of good management.

DD 120 Blue Print Reading	5	0	0	5

Principles of interpreting blue prints and trade specifications common to the building trade. Development of proficiency in making three-view drawings and pictorial sketches.

Plumbing II (Theory and Practice)	5	0	10	9

Principles involved are ventilation, soil, waste, and vent pipes; water supply; inspection and tests, joints on water supply systems, and cold water distribution systems.

THIRD QUARTER

SOC 130 Management Procedures	3	0	0	3

An introduction to the business world, problems of small business operation, basic business law, business forms and records, financial problems, ordering and inventorying, layout of equipment and offices, methods of inproving business, and employer-employee relations.

Plumbing III (Theory and Practice)	5	0	10	9

Emphasis is placed on domestic hot-water supply and systems, private water connection systems, plumbing fixtures, and pumps and lifts in rural water systems.

Heating (Hot water Systems)	3	0	0	3

Principles in design and installation of hot water heating systems.

Welding (Arc and Acetylene)	3	0	5	5

Welding is demonstrated by the instructor and practice is done by the students in the welding shop. Safe and correct methods of assembling and operating welding equipment, including arc welding and acetylene welding is demonstrated and practiced.

PRACTICAL NURSE EDUCATION

INTRODUCTION

The accelerated growth of population in North Carolina and the rapid advancement in medical technology demand an increased number of well-trained personnel for health services. Realizing this need, the State Department of Community Colleges, in conjunction with local hospitals, administers programs of practical nurse education in local communities and in the industrial education centers throughout the State.

The aim of the Practical Nurse Education Program is to make available to qualified persons the opportunity to prepare for participation in care of patients of all ages, in various stages of dependency, and with a variety of illness conditions.

Students are selected on the basis of demonstrated aptitude for nursing as determined by pre-entrance tests, interviews with faculty members, high school record, character references, and reports of medical and dental examination.

Throughout the one-year program the student is expected to grow continuously in acquisition of knowledge and understandings related to nursing, the biological sciences, the social sciences and in the skills related to nursing practice, communications, interpersonal relations, and the use of good judgment. Evaluation of student performance consists of tests on all phases of course content, evaluation of clinical performance, and evaluation of adjustment to the responsibilities of nursing. A passing score is required on all graded work, plus demonstrated progress in the application of nursing skills to actual patient care.

Graduates of accredited programs of practical nurse education are eligible to take the licensing examination given by the North Carolina Board of Nurse Registration and Nursing Education, Enlarge. This examination is given twice each year, usually in April and September. A passing score entitles the individual to receive a license and to use the legal title "Licensed Practical Nurse". The license must be renewed annually. The Licensed Practical Nurse can apply for licensure in other states on the basis of a satisfactory examination score, without repeating the examination.

The LPN is prepared to function in a variety of situations: Hospitals of all types, nursing homes, clinics, doctors' and dentists' offices and, in some localities, public health facilities. In all situations the LPN functions under the supervision of a registered nurse and/or licensed physician. The supervision may be minimal in situations where the patient's condition is stable and not complex; or it may consist of continuous direction in situations requiring the knowledge and skills of the registered nurse or physician. In the latter situation, the LPN may function in an assisting role in order to avoid assuming responsibility beyond that for which the one-year program can prepare the individual.

Job requirements for the Licensed Practical Nurse include suitable personal characteristics, ability to adapt knowledge and understandings of nursing principles to a variety of situations, technical skills for the performance of bedside nursing, appreciation for the differences of people and for the worth of every individual, a desire to serve and help others, and readiness to conform to the requirements of nursing ethics and hospital policies.

The practical nurse education program is a terminal program. It neither prepares the individual for a degree nor for transfer to a professional nursing course. There are, however, post-graduate courses open to the LPN who whishes to specialize in one particular area of nursing, such as Operating Room Technique, Advanced Medical-Surgical Nursing, and Rehabbilitation Techniques.

PRACTICAL NURSE EDUCATION

PRACTICAL NURSING I: FUNDAMENTALS OF PRACTICAL NURSING

OBJECTIVES: To offer the beginning student in practical nursing the opportunity to acquire basic knowledge from nursing and from related areas of learning and to begin to develop the skills needed for safe and effective bedside care of patients whose health deviation has created a state of dependency in matters of daily living.

COURSE MATERIAL:

Nursing - History
Introduction to patient care
Administration of medicines

Health - Personal, physical and mental
Family
Community

Basic Science - Body structure and function
Bacteriology
Basic nutrition

Vocational Adjustments - Introduction to ethics
Introduction to legal aspects of nursing

Communications in Human Relations

Classroom activities are planned to assist the student in the development of knowledge, understanding, appreciations, and the attitudes basic to effective nursing of patients of all ages and backgrounds with nursing needs arising both from the individuality of the patient and from inability for self-care as a result of a health deviation. The student is encouraged to develop beginning skills in analysis of patient needs, both through classroom study of hypothetical patient situations and through planned patient experiences in the clinical environment. Beginning skills in nursing methods are developed through planned laboratory experiences, followed by related practice in actual patient care.

Clinical activities provide introduction to actual patient care through selected clinical assignments requiring the application of current classroom and laboratory learnings.

COURSE HOURS: This curriculum has been developed for a 360-hour teaching period.* It may be offered on a basis of 30 hours per five-day week, six hours daily, for 12 weeks.

PREREQUISITE: Admission to a Program of Practical Nurse Education approved by the North Carolina Department of Community Colleges and/or accredited by the North Carolina Board of Nurse Registration and Nursing Education, Enlarged.

*Minimum requirements of the North Carolina Board of Nurse Registration and Nursing Education, Enlarged, hereafter referred to as the Nursing Board.

PRACTICAL NURSING II: CARE OF PATIENTS WITH MEDICAL-SURGICAL CONDITIONS.

OBJECTIVES: To offer the practical nursing student opportunities to acquire the basic knowledge and understanding and to further develop the skills needed for rendering safe and effective nursing care to adolescent and adult patients with common illness conditions requiring medical and/or surgical treatment.

COURSE MATERIAL: Medical-Surgical Nursing - Patient care
Diet therapy
Medications

Emergency and Disaster Nursing

Communications and Human Relations

Classroom activities center around analysis of nursing needs arising from the illness and/or surgical procedure, as viewed in perspective with the needs arising from the individualtiy of the patient. Related information is presented as it is relevant to the student's understanding of and ability to meet nursing needs of patients.

Clinical activities provide selected experiences in patient care in order for the student to develop skill in applying classroom learnings to a variety of patient situations.

COURSE HOURS: This curriculum has been developed for a 920-hour teaching period and may be offered on a basis of 40 hours per five-day week, eight hours daily, for 23 weeks. *The course must include 125 class hours and 20 weeks of clinical practice.

PREREQUISITE: Practical Nursing I.

*Minimum hours required by the Nursing Board.

PRACTICAL NURSING III: CARE OF THE MATERNITY PATIENT AND NEWBORN INFANT

OBJECTIVES: To offer the practical nursing student opportunities to acquire basic knowledge of pregnancy, labor and delivery, the puerperium, and the neonatal period and to develop beginning skills in rendering safe and effective nursing care to maternity patients and newborn infants.

COURSE MATERIAL: Principles of Obstetrical Nursing

Nutrition in Pregnancy and Infancy

Medications

Communications and Human Relations

Classroom activities center around analysis of nursing needs of the antepartum and post-partum patients and the normal new-born infant. Basic knowledge of obstetrics and related areas is presented as it is relevant to the student's ability to function effectively in recognizing and meeting patient needs.

Clinical activities consist of guided experiences in nursing maternity patients and newborn infants and is planned to parallel classroom learnings.

COURSE HOURS: This curriculum has been developed for a 240-hour teaching period. It may be offered on a basis of 40 hours per five-day week, eight hours daily, for six weeks. *The course must include a minimum of 30 class hours and four weeks of clinical practice.

PREREQUISITE: Practical Nursing I.

*Minimum required by the Nursing Board.

PRACTICAL NURSING IV: CARE OF THE SICK CHILD

OBJECTIVES: To offer the practical nursing student opportunities to acquire basic knowledge concerning the needs of normal, healthy children, the effects of illness on children, and the nursing needs of children of all ages with a variety of common illnesses and to develop beginning skills in recognizing and meeting the nursing needs of the hospitalized child.

COURSE MATERIAL: Growth and development

Principles from Pediatric Nursing

Medications

Nutrition and Diet therapy

Classroom activities center around the needs of children of all ages, the effects of illness on the needs of the child, and the nursing principles to be applied to the care of the sick child.

Clinical activities consist of guided experiences in the care of children with a variety of common illness conditions requiring medical and/or surgical treatment and is planned to parallel classroom learnings whenever possible.

COURSE HOURS: This curriculum has been developed for a 240-hour teaching period. It may be offered on a basis of 40 hours per five-day week, eight hours daily, for six weeks. *The course must include a minimum of 30 class hours and four to six weeks of clinical experience.

PREREQUISITE: Practical Nursing I.

*Minimum hours required by the Nursing Board.

PRACTICAL NURSING V: VOCATIONAL ADJUSTMENTS FOR THE PRACTICAL NURSE

OBJECTIVES: To offer the advanced practical nursing student opportunities to prepare for the transition from the student role to that of Graduate Practical Nurse.

COURSE MATERIAL: Vocational Adjustments - Nursing ethics

Legal aspects of nursing

Nursing organizations

Job Relations

Classroom activities center around experiences designed to promote appreciation for the attitudes and behaviors which will assist the student to adapt to the role of Graduate Practical Nurse and to the expectations of the employing agency.

COURSE HOURS: This curriculum has been developed for a 40-hour teaching period. The hours may be scheduled at the teacher's discretion during the last four weeks of the nursing program. *The course must include a minimum of 15 class hours.

PREREQUISITES: Practical Nursing I, II, III, and IV.

*Minimum hours required by the Nursing Board.

RADIO AND TELEVISION SERVICING

INTRODUCTION

Purpose of Curriculum

Within recent years improved electronic techniques have provided expanded entertainment and educational facilities in the form of monochrome and color television, frequency modulated radio, high fidelity amplifiers and stereophonic sound equipment. These developments require expanded knowledge and skill of the individual who would qualify as a competent and up-to-date serviceman.

This curriculum guide provides a training program which will provide the basic knowledge and skills involved in the installation, maintenance and servicing of radio, television and sound amplifier system. A large portion of time is spent in the laboratory verifying electronic principles and developing servicing techniques.

Job Description

A radio and television serviceman may be required to install, maintain and service amplitude modulated and frequency modulated home and auto radios, transistorized radios, monochrome and color television sets, intercommunication, public address and paging systems, high fidelity and stereophonic amplifiers, record players and tape recorders.

His work will require meeting the public both in the repair shop and on service calls. A serviceman who establishes his own business will also need to know how to maintain business records and inventory.

RADIO AND TELEVISION SERVICING

SUGGESTED CURRICULUM BY QUARTERS

Course Title			Course Hours Per Week			Quarter Hours Credit
FIRST QUARTER			Class	Lab.	Shop Prac.	
MA	125	Electrical Mathematics	5	0	0	5
ELEC	122	Direct and Alternating Current	7	8	3	12
ENG	101	Reading Improvement	2	0	0	2
			14	8	3	19
SECOND QUARTER						
ELN	122	Vacuum Tubes and Circuits	5	10	0	10
ELN	123	Amplifier Systems	2	0	6	4
ENG	102	Communication Skills	2	0	0	2
SOC	101	Human Relations	2	0	0	2
			11	10	6	18
THIRD QUARTER						
ELN	124	Vacuum Tubes and Circuits	4	4	0	6
ELN	125	Radio Receiver Servicing	2	0	6	4
ELN	126	Transistor Theory & Circuits	5	4	0	7
SOC	103	Management Procedures	3	0	0	3
			14	8	6	20
FOURTH QUARTER						
ELN	127	Television Receiver Circuits and Servicing	10	0	15	15
			10	0	15	15
or						
ElN	128	Television Receiver Circuits and Servicing	5	0	12	9
		Elective (1)	5	0	6	7
			10	0	18	16
ELECTIVE						
ELN	129	Single Side-band Systems	5	0	6	7
ELN	130	Two-way Mobile Maintenance	5	0	6	7

RADIO AND TELEVISION SERVICING

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER	Course Hours Per Week: Class	Lab.	Shop. Prac.	Quarter Hours Credit
MA 125 Electrical Mathematics	5	0	0	5

An introductory algebra course with trigonometry and vectors needed in alternating current: algebraic operations of addition, subtraction, multiplication and division; use of letters and signs, grouping, factoring; exponents, ratios and proportions; algebraic and graphic solutions of first-degree equations; introduction to trigonometric functions, their graphs and applications to right triangles. Addition, subtraction and resolution of vector quantities.
Prerequisite: None.

ELEC 122 Direct and Alternating Current	7	8	3	12

A study of the structure of matter and the electron theory, the relationship between voltage, current and resistance in series, parallel and series-parallel circuits. Analysis of direct current circuits by Ohm's Law and Kirchhoff's Law; sources of direct current potentials. Fundamental concepts of alternating current flow; a study of reactance, impedance, phase angle, power and resonance and alternating current circuit analysis.
Prerequisite: None.

ENG 101 Reading Improvement	2	0	0	2

A concentrated effort to improve the student's ability to comprehend what he reads by training him to read more rapidly and accurately. Special machines are used for class drill to broaden the span of recognition, to increase eye coordination and word group recognition, and to train for comprehension in larger units. Reading faults of the individual are analyzed for improvement, and principles of vocabulary building are stressed.
Prerequisite: None.

SECOND QUARTER

ELN 122 Vacuum Tubes and Circuits	5	10	0	10

An introduction to vacuum tubes and their development; the theory, characteristics and operation of vacuum diodes, semi-conductor diodes, rectifier circuits, filter circuits, triodes and simple voltage amplifier circuits.
Prerequisite: ELEC 122, MA 125.

ELN	123 Amplifier Systems	2	0	6	4

An introduction of commonly used servicing techniques as applied to monophonic and stereophonic high fidelity amplifier systems and auxiliary equipment. The operation and servicing of inter-communication amplifiers a and switching circuits will also be taught.
Prerequisites: MA 125, ELEC 122.

ENG	102 Communication Skills	2	0	0	2

Development of ability to communicate effectively through the medium of good language usage in speaking and writing. Organizing thoughts, and presenting thoughts effectively in connection with problems.
Prerequisite: None.

SOC	101 Human Relations	2	0	0	2

Development of understanding of relationships to other persons through some of the basic principles of human psychology. The problems of the individual and his work situation are studied in relation to the established organization of modern business and industry and in relation to government practices and labor organization, with special emphasis on the operating responsibilities of good management.
Prerequisite: None.

THIRD QUARTER

ELN	124 Vacuum Tubes and Circuits	4	4	0	6

A continuing study of tubes and circuits; the theory, characteristics, and operation of the tetrode and pentode tubes, voltage and power amplifiers, tunable RF amplifiers, oscillators and demodulator circuits.
Prerequisites: ELN 123, ELN 122.

ELN	125 Radio Receiver Servicing	2	0	6	4

Principles of radio reception and practices of servicing; included are block diagrams of radio receivers, servicing techniques of AM and FM receivers by resistance measurements, signal injection, voltage analysis, oscilloscope methods of locating faulty stages and components and the alignment of AM and FM receivers.
Prerequisite: ELN 123, ELN 122.

ELN	126 Transistor Theory and Circuits	5	4	0	7

Transistor theory, operation, characteristics and their application to audio and radio frequency amplifier and oscillator circuits.
Prerequisite: ELN 123.

SOC 103 Management Procedures	3	0	0	3

An introduction to the business world, problems of small business operation, basic business law, business forms and records, financial problems, ordering and inventorying, layout of equipment and offices, methods of improving business, and employer-employee relations.
Prerequisite: None.

FOURTH QUARTER

ELN 127 Television Receiver Circuits and Servicing	10	0	15	15

A study of principles of television receivers, alignment of radio and intermediate frequency amplifiers, adjustment of horizontal and vertical sweep circuits will be taught. Techniques of troubleshooting and repair of TV receivers with the proper use of associated test equipment will be stressed. Additional study of more specialized servicing techniques and oscilloscope waveform analysis will be used in the adjustment, troubleshooting and repair of the color television circuits.
Prerequisites: ELN 126, ELN 125.

ELN 128 Television Receiver Circuits and Servicing	5	0	12	7

This course, taught in conjunction with an elective, will be a shortened version of ELN 127.
Prerequisites: ELN 126, ELN 125.

ELECTIVE:

ELN 129 Single Side-band Systems	5	0	6	7

An introductory course of single side-band transmission system with carrier frequency or without and the associated balance modulator of phasing system used to produce this type of transmission. Time will be allotted also to the necessary circuitry in the receiver to receive this type transmission.
Prerequisites: ELN 126, ELN 125.

ELN 130 Two-way Mobile Maintenance	5	0	6	7

A course to acquaint the student with the throry and maintenance of fixed station and mobile station transmitters and receivers. Except for radio laws, sufficient information will be given to qualify the student to take the FCC second class radiotelephone license examination.
Prerequisites: ELN 126, ELN 125.

GENERAL SECRETARIAL PROGRAM

INTRODUCTION

Purpose of Curriculum

The General Secretarial curriculum is designed to prepare students to qualify for secretarial positions in industry and business. The curriculum provides students with necessary secretarial skills to demand the respect of potential employers, and to advance favorably, once employed.

An opportunity is provided in this curriculum for developing a technical vocabulary common to medical and legal secretaries. A background in typing and shorthand is desirable for entering this curriculum.

Job Description

Graduates of this program may qualify for employment as stenographers, secretaries, general secretaries, and/or private secretaries. All secretaries must have a thorough knowledge of the mechanics of the profession -- typing and shorthand; letter writing, which necessitates good spelling, correct grammar, and sentence construction; and the various other tasks that make up the office routine.

The efficient secretary knows that mechanical skill and efficienty may easily be duplicated or replaced, while the intelligent performance of her unscheduled duties, her ability to assist her employer in matters other than her assigned tasks, can be replaced only with difficulty, or not at all. She must be able so to identify herself with her employer's point of view that she can answer his letters, represent him to callers, make minor decisions for him, and take charge of his affairs when he is ill or absent. This she is only able to do by the exercise of intelligent observation, and by sympathetic appreciation of the problems of her employer.

GENERAL SECRETARIAL PROGRAM

Course Title	Course Hours Per Week		Quarter Hours Credit
FIRST QUARTER	Class	Lab.	
BUS 121 Typing I	2	4	4
BUS 101 Introduction to Business	3	0	3
ENG 102 Communication Skills	5	0	5
BUS 115 Business Machines (Duplicators)	2	3	3
MA 112 Business Mathematics	5	0	5
BUS 112 Technical Dictation	2	4	4
	19	11	24
SECOND QUARTER			
BUS 122 Typing II	2	4	4
BUS 114 Technical Dictation	2	4	4
BUS 117 Business Machines (Rotary Calcu.)	2	3	3
ENG 102 Communication Skills	5	0	5
BUS 140 Bookkeeping I	3	2	4
	14	13	20
THIRD QUARTER			
BUS 123 Typing III	2	4	4
BUS 116 Technical Dictation	2	4	4
BUS 119 Business Machines (Key Driven Calculator)	1	2	2
BUS 130 Business Communication	5	0	5
BUS 141 Bookkeeping II	3	2	4
BUS 150 Office Practice	2	2	3
	15	14	22

FOURTH QUARTER

BUS 124	Typing IV	2	4	4
BUS 118	Technical Dictation	2	4	4
BUS 151	Office Management	5	0	5
BUS 152	Business Law	3	0	3
BUS 121	Machine Transcription	1	4	3
BUS 142	Accounting I	2	2	3
		15	14	22

FIFTH QUARTER

BUS 125	Typing V	2	4	4
BUS 123	Machine Transcription	1	4	4
BUS 120	Technical Dictation	2	4	3
ENG 103	Report Writing	3	0	3
BUS 152	Office Management	5	0	5
BUS 143	Accounting II	2	2	3
		15	14	22

SIXTH QUARTER

BUS 126	Statistical Typing	2	4	4
BUS 125	Machine Transcription	1	4	3
ENG 104	Report Writing	3	0	3
SOC 101	Human Relations	2	0	2
1Sc 102	Industrial Organization	3	0	3
	Elective	3	0	3
		14	8	18

GENERAL SECRETARIAL PROGRAM

SUGGESTED CURRICULUM BY QUARTERS

Course Title	Course Hours Per Week		Quarter Hours
FIRST QUARTER	Class	Lab.	Credit
BUS 121 Typing I	2	4	4

Students who have less than two years of High School Typing, or its equivalency, will be required to take this course. Instruction in this course emphasizes the development of speed and accuracy, with further mastery of correct typewriting techniques. Remedial instruction is given for the correction of individual difficulties.

BUS 101 Introduction to Business	3	0	3

This course is designed to give the student an introduction to the areas of bookkeeping, business finances, economics, transportation, management, marketing and business law.

ENG 102 Communication Skills	5	0	5

Development of the ability to communicate effectively through the medium of good language usage in speaking and writing, organizing thoughts, and presenting ideas effectively in connection with problems.

BUS 115 Business Machines (Duplicators)	2	3	3

Students will become familiar with the operation of various duplicating equipment. Instruction will include the care, use, and practing in fluid process duplicators, mimeograph machines, photo-copiers, and the off-set printer. Established procedures, practices and standards found in modern business offices are emphasized throughout this course.

MA 112 Business Math	5	0	5

Mathematical operations and their applications to business: payrolls, price marking, simple and compound interest, discount, commission, inventory, insurance, taxes, and other mathematics related to business.

BUS 112 Technical Dictation	2	4	4

Development of shorthand power through sustained dictation at high speed. Additional work in specialized phrasing, and shortcuts are included. Emphasis is placed on training the student for stenographic work on a production basis. Consideration is also given to appreciation of office problems, up-to-date business procedure, and the development of initiative and independent thinking.

SECOND QUARTER

BUS 122 Typing II	2	4	4

Emphasis in this course is placed on the development of individual production rates.

BUS 114 Technical Dictation	2	4	4

Terminology used by most prevalent businesses is introduced in this course. Through dictation and transcription of subject matter, accuracy, speed and vocabulary are developed.

BUS 117 Business Machines(Rotary Calcula.)	2	3	3

Students will become familiar with adding and calculating machines. Instruction will include care, use, and practice on full-keyboard, adding, and listing machines; rotary calculators, bookkeeping machines, and dictating and transcribing machines. Established procedures, practices and standards found in modern business offices are emphasized throughout the course.

ENG 102 Communication Skills	5	0	5

A concentrated effort to improve the student's ability to comprehend what she reads. Emphasis will also be placed on spelling, punctuation, and grammar.

BUS 140 Bookkeeping I	3	2	4

Emphasis is placed on the bookkeeping cycle in its simplest form. This includes starting a bookkeeping system, recording charges in asset and liability accounts, recording income and expenses, posting, proving the accuracy of posting, preparing profit and loss statements, closing the ledger, and learning the bookkeeping cycle, with special journals and subsidiary ledgers.

THIRD QUARTER

BUS 123 Typing III	2	4	4

This course is a continuation of Business 122, Typing II, with additional practice for speed and accuracy.

BUS 116 Technical Dictation	2	4	4

This is a continuation of Business 114 with special emphasis on accuracy and speed.

BUS 119 Business Machines (Key Driven Calculator)	1	2	2

The student will become more proficient in the operating of calculators, with emphasis on the key driven calculator. This course is also a continuation of Business 117, Business Machines, with additional practice on other machines available at the institution.

BUS 130 Business Communication	5	0	5

The purpose of this course is to assist the student in developing an understanding of the need for effective communication, and in building effective relations in business and industry.

BUS 141 Bookkeeping II	3	2	4

Emphasis is placed on problems in recording bookkeeping transactions, adopting bookkeeping methods to the business, and for special purposes.

BUS 150 Office Practice	2	2	3

Application of knowledge and skills in routine office procedures, with particular emphasis on reception work, mailing and shipping procedures, proper use of telephone and telegraph facilities, banking procedures, and filing systems.

FOURTH QUARTER

BUS 124 Typing IV	2	4	4

Emphasis on advanced speed and accuracy drills, advanced tabulation, office forms, and production work.

BUS 118 Technical Dictation	2	4	4

Development of recording speed, at the expert level. Intensive development of stenographic skill through timed and office-style dictation. Attention will be given to special transcription problems, techniques, and materials.

BUS 151 Office Management	5	0	5

This course is concerned with control and flow of office work, office layout, machines and equipment; employment and training of office workers.

BUS 152 Business Law	3	0	3

This course covers the following areas of business law: the nature and classification of law, the nature of a contract; agency relationships; and negotiable instruments.

BUS 121 Machine Transcription	1	4	3

Transcribing, using various kinds and types of dictating machines.

BUS 142 Accounting I	2	2	3

An introduction to the elements of accounting and general accounting principles is integrated with practice in the use of special journals, with respect to single proprietorship, merchandising, inventory, and sales; accounting for cash, banking procedures, payroll accounting, and accounting for a retail store.

FIFTH QUARTER

BUS 125 Typing V	2	4	4

Continuation of typing, Business 124.

BUS 123 Machine Transcription	1	4	4

Continuation of Business 121, Machine Transcription.

BUS 120 Technical Dictation	2	4	3

Continuation of Business 118, Technical Dictation.

ENG 103 Report Writing	3	0	3

Concentrated effort will be applied to the fundamentals of good writing, sentence structure, proper development of descriptive reporting, and mechanics of report construction. Practice in writing letters, minutes, and various report forms will be given, and some time will be devoted to oral speech and note taking.

BUS 152 Office Management	5	0	5

Continuation of Business 151, Office Management.

BUS 143 Accounting II	2	2	3

A detailed study of the periodic summary, work sheet, trial balance, adjustment and closing procedures at the end of an accounting period. An opportunity to supply all accounting principles and procedures of a sole proprietorship through the use of a practice set.

SIXTH QUARTER

BUS 126 Statistical Typing	2	4	4

Emphasis in this course is placed on the development of individual production rates and the techniques in planning and in typing statistical projects.

These projects include statistical tabulation, typing on printed forms, reports, manuscripts and legal documents.

BUS 125 Machine Transcription	1	4	3

Continuation of Business 123, Machine Transcription.

ENG 104 Report Writing	3	0	3

Continuation of English 103, with emphasis on organization and preparation for presenting business reports orally.

SOC 101 Human Relations	2	0	2

Development of understanding of relationships to other persons through some of the basic principles of human psychology. The problems of the individual and his work situation are studied in relation to the established organization of modern business and industry and in relation to government practices and labor organization, with special emphasis on the operating responsibilities of good management.

ISc 102 Industrial Organization	3	0	3

Methods, techniques, and practices of modern management in planning, organizing and controlling operations of a manufacturing concern. Introduction to the competitive system and the factors constituting product cost.

Elective	3	0	3

Students enrolled in the secretarial program must elect a course in technical vocabulary. A student must select a course in technical vocabulary for the medical profession, legal profession, or a course which might be recommended by his or her Advisor.

SHEET METAL MECHANICS

INTRODUCTION

Purpose of Curriculum

Recent surveys by industrial and governmental agencies in North Carolina have shown a marked shortage of apprentices and other trainees in many trades. This shortage is notably true in the sheet metal trade.

To meet the training needs of those planning to enter or who have already entered this trade, this curriculum guide has been prepared. It is hoped that the curriculum outlined in the guide will provide that valuable background of technical information so greatly needed by each tradesman. It has been assumed that the time allotted to trade practices will hardly do more than acquaint the student with skills and standard practices of the trade. The variety of skilled operations and trade activities to which the student will be exposed should prove most valuable as he enters the trade. Practice in the trade with repetition of the activities learned willserve to fix and improve these skills.

The training processes outlined are not intended to replace the apprenticeship, but rather to provide industry with men ready to learn and with the background to become skilled sheet metal craftsmen. It is believed that this training should provide the enriched trade training program needed in modern industry.

Job Description and Requirements

The graduate of the Sheet Metal Mechanics trade program will be qualified to enter the sheet metal trade as an on-the-job trainee, or apprentice, where he will assist in the planning, layout, installation, and checkout of systems in residential, commercial, or industrial plants.

Sheet metal workers fabricate and install ducts which are used in ventilating, air conditioning, and heating systems. They also fabricate and install a wide variety of other products made from their metal sheets, such as roofing and siding, commercial stainless steel kitchen equipment, partitions, sheet metal shelves in industrial establishments, store fronts, metal framework for neon signs, and chutes used for materials movement.

Union minimum hourly wage rates for sheet metal workers averaged $3.90. Among individual cities surveyed by the U. S. Department of Labor, the minimum hourly rates for sheet metal mechanics ranged from $3.10 in Charlotte, N. C., to $4.65 in New York, N. Y.

SHEET METAL MECHANICS

SUGGESTED CURRICULUM BY QUARTERS

	Course Hours Per Week			Quarter Hours
FIRST QUARTER	Class	Lab.	Shop Prac.	Credit
Mathematics I	5	0	0	5
Drafting I	2	0	3	3
Sheet Metal Practice I	2	0	3	3
Applied Science	1	0	9	4
	10	0	16	15
SECOND QUARTER				
Drafting II	2	0	0	2
Sheet Metal Practice II	1	0	9	4
SOC 101 Human Relations	2	0	0	2
Blue Print Reading	2	0	0	2
WELD 120 Welding (Acetylene)	3	0	9	6
	9	0	15	16
THIRD QUARTER				
WELD 111 Arc Welding	2	0	6	5
Management Procedures	3	0	0	3
Sheet Metal Practice III	1	0	9	4
Estimating	5	0	0	5
	11	0	15	17

SHEET METAL MECHANICS

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER	Course Hours Per Week			Quarter Hours Credit
	Class	Lab.	Shop Prac.	
Mathematics I	5	0	0	5

A review of the fundamentals of mathematics, and an understanding of the trade applications of mathematics. The course includes a review of whole numbers, fractions, powers and roots, and percentages; vocational finance, the use of rules and formulas, and the ratio and proportion; and study with practice in the various forms of direct measurement.

Drafting I	2	0	3	3

An introduction to the scope, place, and practices of drafting in the sheet metal industry. The student will be given an overall picture of the usage of drafting in sheet metal work, instruction and practice, instruction and practice in geometric construction, instruction and practice in the fundamentals of orthographic projection, and basic instruction in floor plans and elevations of simple buildings.

Sheet Metal Practice I	2	0	3	3

An introduction to the scope, history, requirements, and employment opportunities in the industry. The student will become acquainted with the materials of the trade, the basic hand tools, and machines, and he will be given typical small jobs to do, using the tools and machines for familiarization. Each person will be given practice in making flashing and termite shields, and will receive instruction as to their installation. Practice in soft soldering is an integral part of the course.

Applied Science	1	0	9	4

An introductory course in physics and its applications in the field of Air Conditioning and Refrigeration. It will cover systems of measurements, properties of liquids, solids and gases, temperatures, basic machines, and friction. Related areas such as oxidation and reduction, reactions, acids, bases and salts will also be studied. Experiments and laboratory exercises will be utilized and integrated with the theory and classroom assignments.

SECOND QUARTER

Drafting II	2	0	0	2

The second drafting course will be concerned primarily with the use, production, and function of auxiliary views and rotations as they are used in the sheet metal trade. Practice will be given in their usage both for shape description and to determine true lengths or sizes for pattern layout of angular, rectangular, and radial fittings or objects.

Sheet Metal Practice II	1	0	9	4

Sheet metal practice II will consist of development of patterns, and fabrication of the developed patterns. Parallel line development for rectangular pan, rectangular duct, duct elbow (plain, reducing, and transitional), duct offsets, stretchout of a cylinder, pipe intersections of all types, round to oblong transitions, and cornice and gutter stretchout patterns will be featured. Radial-line development will be started and carried through straight and offset cones, and conical transitions between parallel surfaces. All work will be laid out in patterns and formed up out of galvanized iron of standard industrial gages, various fastening devices, such as spot welding, metal screws and riveting, will be used in the fabrication of projects.

SOC 101 Human Relations	2	0	0	2

Development of understanding of relationships to other persons through some of the basic principles of human psychology. The problems of the individual and his work situation are studien in relation to the established organization of modern business and industry, and in relation to government practices and labor organizations, with special emphasis on the operating responsibilities of good management.

Blue Print Reading	2	0	0	2

A correlation or pulling together of the previous drafting course into the reading of building prints and conditioning layouts for the take-off of sheet metal work. Shop sketches will be prepared of each take-off. Examples of take-offs will be flashing, termite shields, ductwork, cornices, louvres, skylights, hoods, canopies, laundry chutes, etc.

Because of the specialized nature of the course no text will be used. The lessons will be group efforts, and the materials will be current prints from the construction industry.

WELD 120 Acetylene Welding	3	0	9	6

Introduction the the history of oxyacetylene Welding, the principles of welding and cutting nomenclature of the equipment, assembly of units. Welding procedures such as practice of puddling and carrying the puddle, running flatbeads, butt welding in the flat, vertical and overhead position, brazing, hard and soft soldering. Safety procedures are stressed throughout the program of instruction.

THIRD QUARTER

WELD 111 Arc Welding	2	0	6	5

The operation of A. C. transformers and D. C. motor generator arc welding equipment. Studies are made of amphere settings, polaraties and electrode selection. After the student is capable of running beads, butts, and fillet welds in all positions, he is tested in order that he may evaluate his work. Safety procedures are emphasized throughout the course.

Management Procedures	3	0	0	3

This course is a study of source of the economic and social fundamentals of the private enterprise system and our modern industrial structure. The responsibilities and procedures for organizing personnel controlling production and planning distribution, as a function of management, will be examined closely to give the student an appreciation of the magnitude of this function.

Sheet Metal Practice III	1	0	9	4

Radial line development including conical reducing elbows, intersection of cones, double curved surfaces, and pyramids will be completed. The major portion of the time will be devoted to development and fabrication of fittings involving triangulation in layout. Typical project will be rectangular-to-rectangular twists, transitions of all types, transitional elbows, and branch fittings. All work will be laid out in patterns for typical fittings, and spot-welds, as well as standard seams, will be used. Practice will also be given in the making and use of "S" locks, drive locks, and standing seam slip joints.

Estimating	5	0	0	5

Development of an understanding of principles involved in estimating labor, time, and materials needed for determining a cost of a job, or combination of jobs.

WELDING

INTRODUCTION

Purpose of Curriculum

This curriculum was developed to fill the tremendous need for weldors in North Carolina. The recently completed Manpower Survey shows quite clearly that many weldors will be needed annually to fill present and projected vacancies in the State.

The content of this curriculum is designed to give students sound understanding of the principles, methods, techniques and skills essential for successful employment in the welding field and metals industry.

The field of welding offers a person prestige, security and a future of continuous employment with steady advancement. It offers employment in practically any industry: shipbuilding, automotive, aircraft, guided missiles, railroads, construction, pipe fitting, production shop, job shop, and many others.

Job Description

Weldors join metals by applying intense heat, and sometimes pressure, to melt the edges to form a permanent bond. Closely related to welding is "oxygen cutting". Of the more than 35 different ways of welding metals, arc, gas, and resistance welding are the three most important.

The principal duty of the weldor using manual techniques is to control the melting by directing the heat, from either an electric arc or gas welding torch, and to add filler metal where necessary to complete the joint. He should possess a great deal of manipulative skill with a knowledge of jigs, welding symbols, mathematics, basic metallurgy, and blue print reading.

WELDING

SUGGESTED CURRICULUM BY QUARTERS

Course Title			Course Hours Per Week			Quarter Hours Credit
FIRST QUARTER			Class	Lab.	Shop Prac.	
MA	120	Fundamentals of Mathematics	5	0	0	5
MECH	124	Structure of Metals	3	2	0	4
WELD	110	Hand and Power Tools	0	0	3	1
DD	122	Blue Print Reading	5	0	0	5
WELD	120	Oxyacetylene Welding and Cutting	3	0	9	6
			16	2	12	21
SECOND QUARTER						
ENG	101	Reading Improvement	2	0	0	2
MA	121	Geometry	3	0	0	3
DD	127	Blue Print Reading	3	0	0	3
ELEC	117	Basic Electricity	3	0	0	3
WELD	111	Arc Welding	3	0	12	7
			14	0	12	18
THIRD QUARTER						
WELD	112	Mechanical Testing and Inspection	0	0	6	3
SOC	101	Human Relations	2	0	0	2
WELD	113	Inert Gas Welding	1	0	3	2
WELD	114	Introduction to Pipe Welding	3	0	12	7
SOC	105	Industrial Economics	3	0	0	3
			9	0	21	17

WELDING

COURSE DESCRIPTIONS BY QUARTERS

FIRST QUARTER	Course Hours Per Week: Class	Lab.	Shop Prac.	Quarter Hours Credit
MA 120 Fundamentals of Mathematics	5	0	0	5

Practical number theory. Analysis of basic operations: addition, subtraction, multiplication and division. Fractions, decimals, powers and roote, percentages, ratio and proportion. Plane and solid geometric figures used in industry; measurement of surfaces and volumes. Introduction to algebra used in trades. Practice in depth.
Prerequisite: None

MECH 124 Structure of Metals	3	2	0	4

Elementary and practical approach to metals, their structure, markings, classifications and uses. Interpretation of properties and specifications of steels by use of manuals, catalogs, charts, etc.
Prerequisite: None.

WELD 110 Hand and Power Tools	0	0	3	1

Designed to introduce the students to the correct use of hand tools found in the metalworking industry. Demonstrations show the proper procedure and safe use of power tools used in the welding and metal shop. Each student is required to complete a series of small projects utilizing hand and power tools.
Prerequisite: None.

DD 122 Blue Print Reading	5	0	0	5

Interpretation and reading of blue prints. Information on the basic principles of the blue print; lines, views, dimensioning procedures and notes.
Prerequisite: None.

WELD 120 Oxyacetylene Welding and Cutting	3	0	9	6

Introduction to the history of oxyacetylene welding, the principles of welding and cutting, nomenclature of the equipment, assembly of units. Welding procedures such as practice of puddling and carrying the puddle, running flat beads, butt welding in the flat, vertical and overhead position, brazing, hard and soft soldering. Safety procedures are stressed throughout the program of instruction.
Prerequisite: None.

SECOND QUARTER

ENG 101 Reading Improvement	2	0	0	2

A concentrated effort to improve the student's ability to comprehend what he reads by training him to read more rapidly and accurately. Special machines are used for class drill to broaden the span of recognition, to increase eye coordination and word group recognition, and to train for comprehension in larger units. Reading faults of the individual are analyzed for improvement, and principles of vocabulary building are stressed.
Prerequisite: None.

MA 121 Geometry	3	0	0	3

Fundamental properties and definitions; plane and solid geometric figures, selected general theorems, geometric construction of lines, angles and plane figures. Dihedral angles, areas of plane figures, volumes of solids. Geometric principles are applied to shop operations.
Prerequisite: None.

DD 127 Blue Print Reading	3	0	0	3

A thorough study of trade drawings in which welding procedures are indicated. Interpretation, use and application of welding symbols, abbreviations, and specifications.
Prerequisite: DD 122.

ELEC 117 Basic Electricity	3	0	0	3

Study of the basic theories of electricity, types of electricity, methods of production, and the transmission and transforming of electricity. The course includes the following topics: electron theory, electricity by chemical action, friction and magnetism, induction, voltage, horsepower, amperage, wattage, transformers, wiring, and resistance.
Prerequisite: None.

WELD 111 Arc Welding	3	0	12	7

The operation of A. C. transformers and D. C. motor generator arc welding sets. Studies are made of welding heats, polaraties, and electrodes for use in joining various metal alloys by the arc welding process. After the student is capable of running beads, butt and fillet welds in all positions are made and tested in order that the student may detect his weaknesses in welding. Safety procedures are emphasized throughout the course.
Prerequisite: WELD 110.

THIRD QUARTER

WELD 112 Mechanical Testing and Inspection	0	0	6	3

The standard methods for mechanical testing of welds. The student is introduced to the various types of tests and testing procedures and performs the details of the test which will give adequate information as to the quality of the weld. Types of tests to be covered are: bend, destructive, free-bend, guided-bend, nick-tear, notched-bend, tee-bend, nondestructive, V-notch, Charpy impact, etc.
Prerequisite: WELD 111.

SOC 101 Human Relations	2	0	0	2

Development of understanding of relationships to other persons through some of the basic principles of human psychology. The problems of the individual and his work situation are studied in relation to the established organization of modern business and industry and in relation to government practices and labor organization, with special emphasis on the operating responsibilities of good management.
Prerequisite: None.

WELD 113 Inert Gas Welding	1	0	3	2

Introduction and practical operations in the use of inert-gas-shield are welding. A study will be made of the equipment, operation, safety and practice in the various positions. A thorough study of such topics as: principles of operation, shielding gases, filler rods, process variations and applications, manual and automatic welding.
Prerequisite: WELD 112.

WELD 114 Introduction to Pipe Welding	3	0	12	7

Designed to provide practice in the welding of pressure piping in the horizontal, vertical, and horizontal fixed position using shielded metal arc welding processes according to Section IX of the ASME code.
Prerequisite: WELD 111.

SOC 105 Industrial Economics	3	0	0	3

Designed to help the student understand present day economic problems. Topics include: production, consumption, exchange and distribution, money and credit, business fluctuations, labor and management relations, and challenges to our system of free enterprise.
Prerequisite: None.

AREAS OF TRAINING OFFERED

SHORT TERM PROGRAMS

AUCTIONEERING

INTRODUCTION

Auctioneering offers a pleasant and profitable profession. The work is enjoyable, the hours are short, the pay sure. It demands no capital. It confines you to no one city or state. It limits income only to the extent of one's energy and ambition.

Auctioneering requires only an understanding of modern selling methods and the ability to publicly put them into practice. It requires only that one be properly educated and trained in the rudiments of the profession. No other profession offers so much for so little.

The Pitt Industrial Education Center offers effective instruction and expert training in the field of auctioneering, at a moderate cost.

Training will include:

Tobacco Auctioneering
Merchandise Sales
Farm Sales
Auction Houses
Household Sales
Auction Ethics
Advertising
Real Estate Laws
Real Estate Titles
Real Estate Contracts
Taxes and Accounting
Tobacco Sales
Estate Liquidations
Real Estate Sales
Livestock Judging
Livestock Ages and Diseases
Public Speaking
Pedigree Study
Machinery Sales
Livestock Sales
Registered Livestock Sales
Auction Licenses and Laws
Auction Sale Financing
Automobile Sales
Business Liquidations
Plus - Other Related Subjects

Instruction in the following:

How to call bids
What to say when opening a sale
How to favorably impress the audience
How to use the public address system
Public speaking
How to get business
How to overcome stage fright
Rythm in your chant
How to remember names
How to start the bidding
Salesmanship
When is the best time to sell
How to protect property
How to advertise sales
Speech and voice
Variety of tones
How to get started in the auction business
Related Subjects.

Cost and Length of Program

(1) Tuition - $14.00, plus a supply fee of approximately $3.00.

(2) The complete course lasts four weeks, six hours per day, five days per week.

(3) Only one class will be organized each year - this being the first week in February, of each year.

Courses in Program

Total Hours

Introduction
- Use of Manual
- Teaching Time

TIE C/O 6-1 - FORCIBLE ENTRY — 9 Hours
- Purpose
- Aim
- Definition
- Outline of Instruction
  - I. Terms used in the building trade
  - II. Conditions requiring forcible entry
  - III. Forcible entry tools
  - IV. Doors
  - V. Windows
  - VI. Roofs
  - VII. Using and caring for a fireman's axe
  - VIII. Floors
  - IX. Exterior Walls, Partitions and Ceilings
- References

TIE C/O 6-2 - ROPE PRACTICES — 9 Hours
- Purpose
- Aim
- Outline of Instruction
  - I. Ropes
  - II. Tying knots and hitches
  - III. Hoisting tools and equipment
  - IV. Miscellaneous uses of rope
  - V. Coiling the handline and lifeline
  - VI. Crowning and splicing rope
  - VII. Tips for care and use of ropes
- References

TIE C/O 6-3 - PORTABLE FIRE EXTINGUISHERS — 9 Hours
- Purpose
- Aim
- Definition
- Outline of Instruction
  - I. Fire triangle
  - II. Classification of fires
  - III. Classification of fire extinguishers
  - IV. Distribution of extinguisher units
  - V. Using portable extinguishers
  - VI. Special extinguishing agents
- References

TIE C/O - LADDER PRACTICES — 9 Hours

Purpose and Scope

Aim

Outline of Instruction

I. Introduction to ladders
II. Handling ladders
III. Special ladder operations
IV. Care of ladders

References

TIE C/O 6-5 - HOSE PRACTICES — 12 Hours

Purpose and Scope

Aim

Outline of Instruction

I. History of fire hose
II. Types of hose commonly used
III. Sizes of hose
IV. Care of fire hose
V. Fire hose couplings
VI. Fire hose nozzles
VII. Fire hose adapters
VIII. Fire hose tools and accessories
IX. Hose rolls and hose connections
X. Fire hose carries and drags
XI. Hose layouts, loading and advancing fire hose
XII. Feeding private protection devices and special appliances.
XIII. Testing fire hose
XIV. Hose inspection records

References

TIE C/O 6-6 - SALVAGE AND OVERHAUL PRACTICES — 9 Hours

Section One - Salvage Practices

Purpose

Aim

Outline of Instruction

I. Definition of salvage
II. Responsibility of the fire department
III. Value in public relations
IV. Salvage equipment
V. Care and preparation of salvage covers
VI. Methods of olding salvage covers
VII. Methods of spreading salvage covers
VIII. Arranging materials to be covered
IX. Removal of water from buildings
X. Restoring the premises
XI. Testing salvage covers

Section Two - Overhaul Practices

Purpose and Scope

Aim

Outline of Instruction

I. Definition of overhaul
II. Value of proper overhaul
III. Overhaul equipment

IV. Searching for hidden fires
V. Extinguishing hidden fires.
VI. Determining the cause of fire
VII. Recognizing and preserving evidence of arson
VIII. Making the building, contents and area safe
IX. Procedure for releasing the premises
X. Obtaining data for official report

References

TIE C/O 6-7 - FIRE STREAM PRACTICES 12 Hours

Purpose and Scope
Aim
Outline of Instruction

I. Fire streams
II. Extinguishing properties of water
III. Requirements for extinguishing a building fire
IV. Types of fire streams
V. Characteristics of good fire streams
VI. Terms, abbreviations, symbols, and measurements
VII. Producing solid streams from handlines
VIII. Producing fog streams from handlines
IX. Friction loss table for small rubber-lined hose
X. Producing master streams
XI. Producing master streams table

References

TIE C/O 6-8 - FIRE APPARATUS PRACTICES 12 Hours

Purpose and Scope
Aim
Outline of Instruction

I. Fire apparatus requirements
II. Special mechanical features and functional equipment
III. The aerial ladder
IV. Procedures for caring for fire apparatus
V. Operation of pumpers (tables)
    A. Centrifugal pumps
    B. Positive displacement pumps

References

TIE C/O 6-9 - VENTILATION 9 Hours

Purpose
Aim
Outline of Instruction

I. Definition of ventilation
II. Advantages of proper ventilation
III. Phases of fire
IV. Complications in performing ventilation
V. Expectancy
VI. Responsibility upon firefighters
VII. Indications of existing conditions
VIII. Visible smoke conditions
IX. Heat conditions and fire severity
X. Providing adequate protection and ventilation

XI. Sizing up the situation
XII. Top or vertical ventilation
XIII. Cross or horizontal ventilation
XIV. Application of fog as an aid to ventilation
XV. Forced ventilation
XVI. Precautions during ventilation practices

References

TIE C/O 6-10 - RESCUE PRACTICES **12 Hours**

Purpose and Scope
Aim
Outline of Instruction
I. Primary functions
II. Secondary functions
III. Incidents and situations involving rescue work
IV. Personal protection requirements
V. Rescue procedure
VI. Rescue practices and techniques

References

TIE C/O 6-11 - PROTECTIVE BREATHING EQUIPMENT **9 Hours**

Purpose
Aim
Outline of Instruction
I. Purpose of breathing equipment
II. Types of breathing equipment
III. Self-contained oxygen-generating breathing equipment "Chemox"
IV. Self-contained demand regulator breathing equipment
V. Self-contained oxygen-rebreathing equipment
VI. Filter-type breathing equipment
VII. Supplied-air type breathing equipment

References

TIE C/O 6-12 - FIREFIGHTING PROCEDURES **12 Hours**

Purpose and Scope
Aim
Definition
Outline of Instruction
I. Alarm response and visual anticipation
II. Arrival and size-up
III. Attack, confine and extinguish
IV. Overhaul and return to quarters

References.

NURSES AIDE TRAINING

Purpose of Curriculum

This curriculum guide was prepared for the purpose of outlining a training program for students of the Nurses Aide Training program. This curriculum has been designed for training persons in the accepted performance of basic duties which will be assigned to Nurses Aides, and to enable the individual student to become proficient in a short time after becoming employed in the field.

A four (4) week, one-hundred sixty (160) hour course, designed to instruct the nurses aide, or the future nurses aide. These classes will consist of sixty (60) clock hours of classroom instruction, and one hundred (100) hours one-the-job training.

There will be a total of four weeks of training. The first week is devoted to class work. There is a total of forty (40) hours of class, or five (5) days per week, eight (8) hours per day. The aide begins the on-the-job training during the second week, with two (2) hours of class work per day. During the remaining two (2) weeks, the aides have one (1) hour of class work per day, with seven (7) hours per day of on-the-job training.

Job Description

Nurses aides are not licensed. Their duties usually consist of working directly under a nurse. Working under a nurse, an aide may make beds, bathe patients, deliver messages, inventory linen, escort patients to other departments of the hospital, help with examinations, and take care of hospital equipment.

Requirements for Enrollment

A. Employed or to be employed by the hospital.
B. Shall be eighteen years of age.
C. Shall be of good moral character.
D. Shall have evidence of physical examination, including chest x-ray and serology.
E. Personal interview by instructor
F. First year of High School education, or equivalent.
G. Shall satisfactorily pass the N. C. State Employment Service Nurses Aide Battery Test.

General Organization of Program

Training experience in the hospital shall consist of a minimum of four weeks. The aide shall be given on-the-job training in the following areas:

A. Medical and Surgical Nursing, three weeks.

A Performance Record shall be kept for each aide.

The instructor, working with the Director of Nursing Service, shall choose the assignments in order to have effective and complete on-the-job training in accordance with the course outline.

The nurses aides shall work a forty-hour week during the training period.

Class hours may be arranged to suit the class and the hospital. There shall be a total of sixty hours of classroom instruction and one hundred hours on-the-job training.

All nurses aides shall be paid a stipend during their on-the-job training.

The uniform will be furnished by the hospital during the training period.

The nurses aides shall conform to and be subject to all rules and regulations of the hospital, unless such rules and regulations are contrary to the terms of the contract between the Pitt Industrial Education Center, and the hospital.

TOBACCO TICKET MARKING SCHOOL

INTRODUCTION

Every tobacco sale requires an expertly-trained ticket marker to follow the sales. In this occupation accuracy is the key word. There are numerous warehouses in the tobacco belt. Warehousemen have expressed a desire for well-trained tobacco ticket markers. To meet this demand, the Pitt Industrial Education Center is offering one hundred hours of instruction annually, to persons interested in training for this occupation.

This course is offered in conjunction with the auctioneering programs so as to provide an environment similar to working conditions of a ticket marker.

Cost and Length of Program

(1) Tuition - $12.00, plus a supply fee of approximately $3.00

(2) The complete course will operate for four weeks, five hours per day, for five days per week.

(3) Only one class will be organized each year - this being the first week in February, of each year.