

# DEPARTMENT OF INDUSTRIAL TECHNOLOGIES

## Undergraduate Degree(s):

- Bachelor of Science in Industrial Technology (Construction Technology Concentration) (<https://catalog.tsu.edu/undergraduate/schools-colleges/science-engineering-technology/industrial-technologies/industrial-technology-construction-technology-concentration-bs/>)
- Bachelor of Science in Industrial Technology (Design Technology Concentration) (<https://catalog.tsu.edu/undergraduate/schools-colleges/science-engineering-technology/industrial-technologies/industrial-technology-design-technology-concentration-bs/>)

The Bachelor of Science (B.S.) degree in Industrial Technology, with concentrations in Construction Technology (CONS) and Design Technology (DRFT), is offered in the Department of Industrial Technologies. Supporting courses in Cooperative Education (COE), Industrial Technology (ITEC), and Automated Manufacturing Technology (MFG) are also offered through the Department. Two minors are offered for students pursuing majors in other academic disciplines and who are required to declare a minor in a second academic discipline for graduation. One minor is offered in Industrial Technology, and the other minor is offered in Community Development. The program is accredited by The Association of Technology, Management, and Applied Engineering (ATMAE). Members of the Department are housed in the Leonard H.O. Spearman Technology Building. Detailed information on concentrations and minors is provided below.

In seeking the B.S. in Industrial Technology through this unit, students may select from two (2) different curriculum concentrations that focus on one of the following areas of concentration: Construction Technology or Design Technology. Students are not required to declare a minor in a second academic discipline in selecting one of the available concentrations. Detailed information on both options leading to the B.S. in Industrial Technology is provided below.

The primary mission of the Department is to offer programs of study designed to prepare students as “management-oriented technical professionals” who have practical knowledge, competencies, skills, and training to serve and function in the Industrial/ Manufacturing Enterprise System. In pursuing this mission, the Department seeks to prepare Industrial Technologists and Technical Managers for career opportunities in the Manufacturing, Construction, and Communications Industries.

Students wishing to earn the B.S. in Industrial Technology must first gain admission to the University, must satisfy TSI requirements and eradicate identified deficiencies through the Student Academic Enhancement Services (SAES), must contact the Department Office while satisfying TSI requirements for advisement, and must petition the Department for admission once TSI requirements have been completed and deficiencies removed. Students wishing to minor in Industrial Technology should contact the Department Office once they have been admitted as majors in other academic units of the University and have met all TSI requirements. **Prior to graduation, all courses required for the major must be completed with grades of “C” or better (grades below “C”, including “C-”, are unacceptable) and majors must pass an exit examination during their senior year. All transfer students and those students requesting a minor in Industrial Technology must have a GPA of 2.5 or better.**

**For the minor in Industrial Technology, twenty-one (21) semester credit hours must be completed with grades of “C” or better (grades below “C”, including “C-”, are unacceptable).** Fifteen (15) of the twenty-one (21) credits must be selected from one of two academic disciplines offered through the unit: CONS or DRFT. Three (3) additional semester credit hours must be selected from a second of these two disciplines. The last three (3) semester credit hours required must be taken through enrollment in one of the following:

Code	Title	Hours
ITEC 331	Technical Writing	3
ITEC 333	Ind Superv & Management	3
ITEC 439	Industrial Safety	3

Minors must also complete the following two (2) Mathematics courses or their equivalents in conjunction with the designated twenty-one (21) semester credit hours above and with the same grade restrictions: MATH 1314 College Algebra and MATH 134 Plane Trigonometry. All programs of study for minors must be approved, in advance, by the Faculty Chair prior to enrollment in courses.

The minor in Community Development represents a comprehensive, interdisciplinary approach that includes courses offered through the unit, as well as courses offered through other units at the University. A total of twenty-one (21) semester credit hours must be completed which are broadly apportioned between theoretical knowledge (18 credits) and experiential learning (3 credits). **Courses enrolled for in seeking this minor must be completed with grades of “C” or better where grades below “C”, including “C-”, are unacceptable.** Students seeking the Community Development minor are required to enroll in the following courses offered through this unit:

Code	Title	Hours
ITEC 131	Intro to Community Develop	3
ITEC 335	Community Development Finance	3
CONS 344	Const Mgmt I	3
CONS 435	Contracts & Specs	3
COE 333	Cooperative Education	3

Outside of this unit, students are required to complete the following two courses in order to complete the minor: SOC 337 Urban Community Life and MGMT 400 Small Business Mgmt.

**Students requiring additional information should contact the Department either directly or by calling 713- 313-7679.**

- Industrial Technology (Construction Technology Concentration), Bachelor of Science (<https://catalog.tsu.edu/undergraduate/schools-colleges/science-engineering-technology/industrial-technologies/industrial-technology-construction-technology-concentration-bs/>)
- Industrial Technology (Design Technology Concentration), Bachelor of Science (<https://catalog.tsu.edu/undergraduate/schools-colleges/science-engineering-technology/industrial-technologies/industrial-technology-design-technology-concentration-bs/>)

## Construction Technology Courses

### CONS 131 Introduction Const Development (3 Credits)

**Lecture:** 3, **Lab:** 0

Construction Methods and Materials I (2) Introduction to the overall construction industry with emphasis on practices, methods, and materials used in various building disciplines. Construction processes also discussed. Two hours of lecture per week. Corequisite: CONS 131L.

**College/School:** Col of Science, Engr & Tech

**Department:** Dept of Industrial Tech

### CONS 141 Construction Materials & Application (2 Credits)

**Lecture:** 2, **Lab:** 0

Sources, properties, acceptable and recommended applications of industrial materials in the construction industry. Two hours of lecture per week. Prerequisite: CONS 131. Corequisite: CONS 141L.

**Prerequisite(s):** (CONS 131)

**College/School:** Col of Science, Engr & Tech

**Department:** Dept of Industrial Tech

### CONS 141L Materials and Applications Lab (1 Credits)

**Lecture:** 0, **Lab:** 1

Laboratory exercises on application of industrial materials. Two hours of laboratory per week. Prerequisite: CONS 131L. Corequisite: CONS 141.

**Prerequisite(s):** CONS 131

**College/School:** Col of Science, Engr & Tech

**Department:** Dept of Industrial Tech

### CONS 242 Framing Principles (1 Credits)

**Lecture:** 1, **Lab:** 0

Framing Principles (1) Foundation and wall framing techniques essential to residential and light commercial construction and construction details involving form building, bracing, steps, and geometry of roofing systems.

One hour of lecture per week. Prerequisite: CONS 131. Corequisite: CONS 242L.

**Prerequisite(s):** CONS 141

**College/School:** Col of Science, Engr & Tech

**Department:** Dept of Industrial Tech

### CONS 242L Framing Principles Lab (2 Credits)

**Lab:** 2

Framing Principles Laboratory (2) Laboratory exercises in foundation and wall framing techniques and construction details for residential and light commercial construction. Four hours of laboratory per week. Prerequisite: CONS 131L. Corequisite: CONS 242.

**College/School:** Col of Science, Engr & Tech

**Department:** Dept of Industrial Tech

### CONS 243 Energy Effncy in Const (3 Credits)

**Lecture:** 1, **Lab:** 4

Energy Efficiency and Construction (1) Sizing, designing, and laying out of electrical and mechanical systems for maximum efficiency in residential and light commercial buildings. Solar and earth energy emphasized.

One hour of lecture per week. Prerequisite: CONS 242. Corequisite: CONS 243L.

**Prerequisite(s):** CONS 242

**College/School:** Col of Science, Engr & Tech

**Department:** Dept of Industrial Tech

### CONS 243L Energy Effncy Const Lab (2 Credits)

**Lecture:** 0, **Lab:** 2

Energy Efficiency and Construction Laboratory (2) Practices in sizing, designing, and laying out of electrical and mechanical systems for maximum efficiency in residential and light commercial buildings. Four hours of laboratory per week. Prerequisite: CONS 242L. Corequisite: CONS 243.

**Prerequisite(s):** CONS 242L

**College/School:** Col of Science, Engr & Tech

**Department:** Dept of Industrial Tech

### CONS 244 Construction Safety (3 Credits)

**Lecture:** 3

Construction Safety (3) Examination of specialized procedures in health, safety, and environmental protection and lost prevention for the construction industry. Requirements of OSHA and other federal and state standards and regulations emphasized. Three hours of lecture per week.

**College/School:** Col of Science, Engr & Tech

**Department:** Dept of Industrial Tech

### CONS 331 Models & Presentations (3 Credits)

**Lecture:** 1, **Lab:** 4

Models and Presentations (3) Three-dimensional requirements for models using computer-aided drafting techniques and cardboard, plastic, and wood media. Plan reading, scaling, and sketching emphasized. One hour of lecture and four hours of laboratory per week. Prerequisites: DRFT 336, CONS 242, and CONS 242L.

**Prerequisite(s):** (DRFT 133 and DRFT 232 and CONS 242)

**College/School:** Col of Science, Engr & Tech

**Department:** Dept of Industrial Tech

### CONS 333 Quantity Surveying (3 Credits)

**Lecture:** 2, **Lab:** 2

Quantity Surveying (3) Quantity surveying for construction and engineering along with bid preparation and analysis where computer applications are emphasized. Two hours of lecture and two hours of laboratory per week. Prerequisite: Consent of the instructor.

**Prerequisite(s):** (CONS 242 and DRFT 133)

**College/School:** Col of Science, Engr & Tech

**Department:** Dept of Industrial Tech

### CONS 334 Concrete Technology (3 Credits)

**Lecture:** 1, **Lab:** 4

Concrete Technology (3) Methods for forming concrete, concrete elements and handling, and reinforced concrete. One hour of lecture and four hours of laboratory per week. Prerequisites: CONS 242, CONS 242L, and DRFT 336.

**Prerequisite(s):** (CONS 242 and DRFT 133)

**College/School:** Col of Science, Engr & Tech

**Department:** Dept of Industrial Tech

### CONS 341 MEPFI Systems (3 Credits)

**Lecture:** 1, **Lab:** 4

Essentials of Plumbing (3) Study of tools, equipment, and plumbing systems for various job types. Fixture selection and installation emphasized. One hour of lecture and four hours of laboratory per week. Prerequisite: Consent of the instructor.

**Prerequisite(s):** (CONS 242 and DRFT 232)

**College/School:** Col of Science, Engr & Tech

**Department:** Dept of Industrial Tech

**CONS 344 Const Mgmt I (3 Credits)****Lecture: 1, Lab: 4**

Construction Management I (3) Study of the principles of construction systems management with emphasis on stages of construction, management information systems, and operations management. One hour of lecture and four hours of laboratory per week. Prerequisites: CONS 331 and CONS 334.

**Prerequisite(s):** CONS 334**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**CONS 433 Estimating (3 Credits)****Lecture: 1, Lab: 4**

Estimating (3) Instruction in making materials and labor estimates for residential and light commercial buildings primarily from the use of working drawings. One hour of lecture and four hours of laboratory per week. Prerequisites: CONS 242, CONS 242L, and DRFT 232 or the equivalents.

**Prerequisite(s):** (CONS 242 and DRFT 232 and CONS 333)**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**CONS 435 Contracts & Specs (3 Credits)****Lecture: 2, Lab: 2**

Contracts and Specifications (3) Legal aspects of contracts, specifications, and legal documents along with bidding procedures. Students required to develop contract documents and specifications. Two hours of lecture and two hours of laboratory per week. Prerequisites: Senior standing and consent of the Faculty Chair or instructor.

**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**CONS 436 Const Mgmt II (3 Credits)****Lecture: 2, Lab: 2**

Construction Management II (3) Management functions by which construction projects are authorized, financed, supervised, and closed out. Emphasis on the development of effective supervisory and managerial techniques using computer databases. Two hours of lecture and two hours of laboratory per week. Prerequisite: Senior standing or consent of the instructor.

**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**CONS 437 Const Problems (3 Credits)****Lecture: 3, Lab: 0**

Construction Problems (3) Independent, in-depth study and analysis of special problems related to construction where students must use critical and creative thinking skills for formulating solutions. Three hours of lecture per week. Prerequisites: Senior standing and consent of the instructor.

**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**CONS 451 Mechanical Systems (3 Credits)****Lecture: 1, Lab: 4**

Mechanical Systems (3) Principles of air conditioning and heating systems used in commercial and residential buildings with emphasis on planning and designing systems. One hour of lecture and four hours of laboratory per week. Prerequisite: Consent of the instructor.

**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**CONS 475 Facilities management (3 Credits)****Lecture: 2, Lab: 2**

Facilities Operations (3) Techniques in the overall operation and maintenance of facilities such as schools, housing projects, and municipal buildings. Structural, supervision, and life cycle costing using computer applications emphasized. Two hours of lecture and two hours of laboratory per week. Prerequisite: Consent of the instructor.

**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech

## Drafting and Design Technology Courses

**DRFT 131 Fundamentals Of Drafting (3 Credits)****Lecture: 1, Lab: 4**

Fundamentals of Drafting (3) Use and care of drafting instruments, lettering, geometric construction, freehand sketching, and orthographic projections. Introduction to computer aided drafting included. One hour of lecture and four hours of laboratory per week.

**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**DRFT 132 Descriptive Geometry (3 Credits)****Lecture: 1, Lab: 4**

Descriptive Geometry (3) Folding line relationships and notations, auxiliary views, angles between plane revolutions, and intersections. One hour of lecture and four hours of laboratory per week. Prerequisite: DRFT 131.

**Prerequisite(s):** (DRFT 131)**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**DRFT 133 Architectural Drafting (3 Credits)****Lecture: 1, Lab: 4**

Architectural Drafting (3) Fundamental architectural drafting practices related to developing working drawings for residential and light commercial buildings. One hour of lecture and four hours of laboratory per week. Prerequisite: DRFT 131. Listed as ARCH 2201 in the Texas Common Course Numbering System.

**Prerequisite(s):** (DRFT 131)**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**DRFT 134 Mechanical Drawing (3 Credits)****Lecture: 1, Lab: 4**

Mechanical Drawing (3) Emphasis on orthographic and auxiliary projection, threads and fasteners, machine drawings and perspectives. One hour of lecture and four hours of laboratory per week. Prerequisite: DRFT 131.

**Prerequisite(s):** (DRFT 131)**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**DRFT 136 Architecural Rendering (3 Credits)****Lecture: 1, Lab: 4**

Architectural Rendering (3) Artistic requirements in architecture, including emphasis on perspectives, shapes, shadows, and color presentations. One hour of lecture and four hours of laboratory per week. Prerequisite: DRFT 133.

**Prerequisite(s):** DRFT 133**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech

**DRFT 231 Pipe Drafting (3 Credits)****Lecture:** 1, **Lab:** 4

Pipe Drafting (3) Piping terminology, charts, tables, and practices in providing single and double line drawings. One hour of lecture and four hours of laboratory per week. Prerequisite: DRFT 134.

**Prerequisite(s):** (DRFT 134)**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**DRFT 232 Architectural Design (3 Credits)****Lecture:** 2, **Lab:** 4

Architectural Design (3) Study of the influences, which determine the appearances of architectural structures. One hour of lecture and four hours of laboratory per week. Prerequisite: DRFT 133.

**Prerequisite(s):** (DRFT 133)**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**DRFT 233 Intro Comp-Aided Design (3 Credits)****Lecture:** 1, **Lab:** 4

Introduction to Computer-Aided Design (3) Basic concepts, operations, and procedures necessary for producing engineering drawings on the computer. One hour of lecture and four hours of laboratory per week. Listed as ARCH 1315 in the Texas Common Course Numbering System.

**Prerequisite(s):** (DRFT 131)**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**DRFT 331 Pipe System Design (3 Credits)****Lecture:** 1, **Lab:** 4

Pipe System Design (3) Problems in piping design-utilizing vendor furnished equipment specifications and drawings, Smoley's tables, and related control documents. One hour of lecture and four hours of laboratory per week. Prerequisite: DRFT 231. Offered as needed.

**Prerequisite(s):** (DRFT 231)**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**DRFT 333 Machine Design (3 Credits)****Lecture:** 1, **Lab:** 4

Machine Design (3) Theory and practice of design characteristics for studying gears, cams, and complete assembly drawings of small machines. One hour of lecture and four hours of laboratory per week. Prerequisites: CIVT 232 and DRFT 134. Offered as needed.

**Prerequisite(s):** (DRFT 134 and DRFT 233)**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**DRFT 336 Computer-Aided Design (3 Credits)****Lecture:** 1, **Lab:** 4

Computer-Aided Design (3) Advanced concepts of computer-aided design (CAD) utilizing the more complex capabilities of the equipment and software. One hour of lecture and four hours of laboratory per week.

**Prerequisite(s):** (DRFT 232)**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**DRFT 430 Adv Comp-Aided Design (3 Credits)****Lecture:** 1, **Lab:** 4

Advanced Computer-Aided Design (3) Continuation of DRFT 336 with emphasis on the development of three-dimensional designs, script files, and AUTOLISP programming. One hour of lecture and four hours of laboratory per week. Prerequisite: DRFT 336.

**Prerequisite(s):** DRFT 233**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**DRFT 431 Structural Drafting and Design (3 Credits)****Lecture:** 1, **Lab:** 4

Structural Drafting (3) Fabrication, connectors and seats for beams, girders, columns, and trusses adhering to AISC standards. One hour of lecture and four hours of laboratory per week. Prerequisite: DRFT 131 and consent of the instructor.

**Prerequisite(s):** DRFT 133**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**DRFT 432 Senior Design Project (3 Credits)****Lecture:** 1, **Lab:** 4

Senior Design Project (3) Integration of previous knowledge in the development of a design project. One hour of lecture and four hours of laboratory per week. Prerequisites: Senior standing and consent of the Faculty Chair.

**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech

## Industrial Technology Courses

**ITEC 111 Orientation (1 Credits)****Lecture:** 1, **Lab:** 0

Orientation (1) Orientation to the School of Technology and the University with discussion of career opportunities available in industrial and engineering technology and related area. One hour of lecture per week.

**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**ITEC 131 Intro to Community Develop (3 Credits)****Lecture:** 3

Introduction to Community Development (3) Introduction to community development with emphasis on community development issues: new construction and rehabilitation, residential and commercial development, and business development. Three hours of lecture per week.

**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**ITEC 331 Technical Writing (3 Credits)****Lecture:** 3, **Lab:** 0

Technical Writing (3) Techniques of collecting and presenting technical and scientific data, including definitions, evaluations, basic letters, abstracts, memoranda, and written reports. Three hours of lecture per week. Prerequisite: ENG 131.

**Prerequisite(s):** (ENG 131 and ENG 132)**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech

**ITEC 333 Ind Superv & Management (3 Credits)****Lecture: 3, Lab: 0**

Industrial Supervision and Management (3) Study of management and supervision skills and concepts to enhance interpersonal relationships and motivational factors necessary for productivity in an organized industrial environment. Three hours of lecture per week. Prerequisite: Junior standing and consent of the Faculty Chair.

**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**ITEC 335 Community Development Finance (3 Credits)****Lecture: 3**

Community Development Finance (3) Explores the financial skills required for the successful operation of a community development corporation within the context of overall economic development finance. Three hours of lecture per week. Prerequisite: ITEC 131.

**Prerequisite(s):** ITEC 131**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**ITEC 412 Senior Seminar (1 Credits)****Lecture: 1, Lab: 0**

Senior Seminar (1) Organized to help senior students prepare to exit the University and to become employed. Emphasis on interviewing skills and resume preparation. One hour of lecture per week. Prerequisite: Senior standing and consent of the Faculty Chair.

**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**ITEC 437 Driver & Traffic Safety Tech I (3 Credits)****Lecture: 3****College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**ITEC 438 Driver & Traff Safety Tech II (3 Credits)****Lecture: 3****Prerequisite(s):** (ITEC 437 (may be taken concurrently))**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**ITEC 439 Industrial Safety (3 Credits)****Lecture: 3, Lab: 0**

Industrial Safety (3) Study of safety management and enforcement techniques in an industrial environment with emphasis on personal safety. Three hours of lecture per week. Prerequisites: Senior standing and consent of the Faculty Chair.

**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**ITEC 495 Special Topics (3 Credits)****Lecture: 3****College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech

## Automated Manufacturing Technology

**MFG 131 Manufacturing Technology I (3 Credits)****Lecture: 1, Lab: 4**

Manufacturing Technology I (3) Manufacturing processes for industrial plastics, wood, and wood composite materials. Production methods, process equipment, tooling, jogs, and fixtures for plastics, wood, and wood composites used in manufacturing. One hour of lecture and four hours of laboratory per week.

**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**MFG 231 Manufacturing Processes (3 Credits)****Lecture: 3, Lab: 0**

Manufacturing Processes (3) Study of engineering materials and processes as they pertain to the manufacture of industrial products. Three hours of lecture per week.

**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**MFG 232 Applied Statics (3 Credits)****Lecture: 1, Lab: 4**

Manufacturing Technology II (3) Manufacturing processes for ferrous and non-ferrous metals. Precision machine tool operations, including grinding, drilling, shaping, milling, and turning. One hour of lecture and four hours of laboratory per week. Prerequisite: MFG 131.

**Prerequisite(s):** MATH 134 or MATH 138 and MFG 232L and PHYS 237**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**MFG 331 CNC Computer Programming (3 Credits)****Lecture: 1, Lab: 4**

CNC Computer Programming (3) Theory of computer-aided parts programming. Methods of programming CNC machines; set up and operation with emphasis on two, three, and multiple axis machines, mills, lathes, and robots. One hour of lecture and four hours of laboratory per week. Prerequisite: Consent of the instructor.

**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**MFG 332 Robotics Tech (3 Credits)****Lecture: 1, Lab: 4**

Robotics Technology (3) Automated technology through the use of industrial robots; theory of electromechanical, hydraulic, and pneumatic robots in manufacturing; robots for processing, assembly, and material handling. One hour of lecture and four hours of laboratory per week.

**Prerequisite:** MFG 331.**Prerequisite(s):** MFG 331**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**MFG 333 Strength Of Materials (3 Credits)****Lecture: 1, Lab: 4**

Strength of Materials (3) Study of the physical properties of a variety of industrial materials. One hour of lecture and four hours of laboratory per week. Prerequisite: Junior standing and consent of the instructor.

**Prerequisite(s):** (MATH 134 and PHYS 235)**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech**MFG 432 Flexible Mfg Systems (3 Credits)****Lecture: 1, Lab: 4**

Flexible Manufacturing Systems (3) Introduction to computer integrated manufacturing and flexible manufacturing systems. Planning, organization, and management of automated computer controlled systems. One hour of lecture and four hours of laboratory per week.

**Prerequisite:** MFG 331.**Prerequisite(s):** MFG 331**College/School:** Col of Science, Engr & Tech**Department:** Dept of Industrial Tech

**MFG 433 Manufacturing Tec Problems (3 Credits)**

**Lecture:** 1, **Lab:** 4

Manufacturing Technology Problems (3) Individual study of problems in an industrial setting with regard to personnel, material, equipment, and facilities as they relate to manufacturing. One hour of lecture and four hours of laboratory per week. Prerequisites: Senior standing and consent of the instructor.

**College/School:** Col of Science, Engr & Tech

**Department:** Dept of Industrial Tech

## Cooperative Education Courses

**COE 001 COOP EDU TRAINING PROGRAM (0 Credits)**

**Lab:** 0

**College/School:** Col of Science, Engr & Tech

**Department:** Dept of Industrial Tech

**COE 233 Cooperative Education (3 Credits)**

**Lecture:** 1, **Lab:** 40

Cooperative Education (3) First training period designed to give students full-time experience in industry. They are introduced to training in concentration areas, are supervised closely, and begin developing interpersonal skills. Forty hours of work experience per week. Prerequisites: completion of at least 30 semester credit hours with minimum GPA of 2.5.

**College/School:** Col of Science, Engr & Tech

**Department:** Dept of Industrial Tech

**COE 235 Cooperative Education (3 Credits)**

**Lecture:** 1, **Lab:** 40

Cooperative Education (3) Second training period designed to make students assertive in the workplace and aware of gaining upward mobility. Students continue to develop skills in their chosen career areas and are closely supervised. Forty hours of work experience per week. Prerequisite: COE 233.

**Prerequisite(s):** COE 233

**College/School:** Col of Science, Engr & Tech

**Department:** Dept of Industrial Tech

**COE 333 Cooperative Education (3 Credits)**

**Lecture:** 1, **Lab:** 40

Cooperative Education (3) Third training period where students continue career related work in their chosen areas. Students exposed to analyzing and evaluating their career choices through training requirements, working conditions, and employment outlook. Forty hours of work experience per week. Prerequisite: COE 235.

**Prerequisite(s):** COE 235

**College/School:** Col of Science, Engr & Tech

**Department:** Dept of Industrial Tech

**COE 433 Cooperative Education (3 Credits)**

**Lecture:** 1, **Lab:** 40

Cooperative Education (3) Fourth training period where the student/ employer exposure is well established and students are prepared for full-time employment upon graduation. Variables affecting decision making and other factors enhancing employee-employer relations explored. Forty hours of work experience per week. Prerequisite: COE 333.

**Prerequisite(s):** COE 333

**College/School:** Col of Science, Engr & Tech

**Department:** Dept of Industrial Tech