



Southeastern Louisiana University

Industrial Technology

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Professor: Bostic

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CONSTRUCTION TECHNOLOGY (CTEC)

101. Construction Industry Systems.

Credit 3 hours. A study of construction systems providing an understanding of how construction impacts life, socially and professionally. Industry fundamentals through analysis of architectural and engineering plans, specifications, and documents used in the planning, bidding, pre-construction, construction, and close-out phases of a typical construction project.

111. Construction Graphics.

Credit 3 hours. An introduction to construction graphics the reading of blueprints; covering types of construction, specifications, sitework, structural steel construction, reinforced concrete construction, mechanical and electrical systems, and finish construction.

121. Construction Materials.

Credit 3 hours. Prerequisite: CTEC 111. An introduction to construction principles, materials, and methods in the construction industry. graphics: covering sitework, concrete, masonry, metals, wood, plastic, doors and windows, and finishes. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

171. Survey Principles.

Credit 3 hours. Prerequisite: CTEC 111 and IT 111. Theories and principles of traditional and state-of-the-art techniques in surveying as applied to the construction industry. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

201. Project Management.

Credit 3 hours. Prerequisite: CTEC 101. An introduction to project management: covering human relations, labor law and relations, problem solving and decision making, construction planning, project scheduling, and quality control.

202. Project Supervision.

Credit 3 hours. Prerequisite: CTEC 121. An introduction to project supervision: covering orientation to the job, construction documents and documentation, cost awareness and control, resource control, and safety.

203. Computer Planning and Scheduling.

Credit 3 hours. Prerequisites: Credit for or enrollment in CTEC 202 and 271. Analysis and application of scheduling techniques. The use of critical path method (CPM), program evaluation and review (PERT), and PRIMAVERA

271. Construction Estimating I.

Credit 3 hours. Prerequisite: CTEC 121. An introduction to residential construction estimating: covering construction estimating, productivity records, cost accounting, project owner's estimate, pre-construction design estimates, detailed construction estimate, quantity surveying, how to determine direct cost for the project, and integrating estimating with project planning and control.

DESIGN DRAFTER TECHNOLOGY (DDT)

113. Architectural Drafting.

Credit 3 hours. Prerequisite: Industrial Technology 111. Principles and practices of architectural drawing, terminology, and construction through residential planning and design, including floor plans, elevations, sectional details and plat plans. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

114. Technical Illustration.

Credit 3 hours. Prerequisite: Industrial Technology 111 and Industrial Technology 215. The transmission of engineering drawings into three-dimensional drawings using principles and techniques of axonometric, perspective, and schematic drawing. Includes lettering, reproduction methods, color rendering, air brush techniques and various mechanical aids. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

211. Piping Drafting.

Credit 3 hours. Prerequisite: Industrial Technology 215-Computer Aided Drafting. Piping fundamentals as used in refinery and petrochemical plant design. Drafting of pipes, fittings, flanges, valves, symbols and dimensioning. Isometric standard detailing, call-outs, and structural foundations. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

212. Machine Drafting and Design.

Credit 3 hours. Prerequisites: Industrial Technology 215-Computer Aided Drafting. Advanced study and applications of detailed and assembly drawings of machines, including precision dimensioning and tolerancing; ASA specifications and symbols; notes, call-outs, material lists, treatments and finishes. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

215. Light Commercial Building Drafting.

Credit 3 hours. Prerequisites: Industrial Technology 111 and Design Drafter Technology 113 [IT 113]. Analysis and solution of basic problems in the design and construction of small commercial properties using a variety of materials and methods of construction. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

218. Special Topics in Drafting.

Credit 3 hours. Prerequisites: A 2.000 adjusted major average, Sophomore standing and 15 semester hours of drafting or permission of the Department Head. A course designed to provide the student with an opportunity to gain greater specialization in a specific area or to develop skills in areas otherwise not covered in the curriculum. May be repeated for a maximum of six credit hours.

INDUSTRIAL TECHNOLOGY (IT)

111. Engineering Drafting.

Credit 3 hours. The basic elements of drafting: selection and use of instruments, lettering, applied geometry, freehand sketching, orthographic projection, sectioning, dimensioning, isometric and oblique pictorial representation, fastener symbols and simple auxiliary views. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

112. Descriptive Geometry.

Credit 3 hours. Prerequisite: Industrial Technology 111. Industrial and engineering application of design concepts involving the uses of points, planes, and lines; spatial relationships. The application of primary, secondary, and successive auxiliaries used in the various engineering disciplines. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

209. Special Topics.

Credit 3 hours. Organized class or individual instruction. May be repeated when topics vary for a maximum of six credit hours.

215. [TIM 215] Computer-Aided Drafting (CAD).

Credit 3 hours. Prerequisites: Industrial Technology 111 and permission of instructor to enroll. Study of terminology, concepts, theories, and fundamental skills necessary to understand and operate a CAD system. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

216. Advanced Computer-Aided Drafting and Design.

Credit 3 hours. Prerequisites: Industrial Technology 215 and permission of instructor to enroll. An advanced study of the terminology, concepts, and theory relating to applications in solid model development and their analysis, LISP routines, and user system configuration. Two hours of lecture and two hours of laboratory per week. Laboratory fee: \$15.00

233. Introduction to Basic Electricity and Electronics.

Credit 3 hours. The fundamental concepts of electricity and electronics that involve direct current (dc), alternating current (ac), series and parallel resistive circuits, network analysis, magnetism, inductance, capacitance, transformers, motors, residential wiring, electronic components, and various types of test equipment found in industry. Two hours of lecture and two hours of laboratory problem solving per week. Laboratory fee: \$15.00.

236. Advanced Electronics.

Credit 3 hours. Prerequisite: Industrial Technology 233. The study of semi-conductor electronics beginning with the diode, progressing through transistors, amplifiers, JFETs, MOSFETs, OP-AMPS, power supplies, oscillators, thyristors, and integrated circuits (ICs). Two hours of lecture and two hours of laboratory problem solving per week. Laboratory fee: \$15.00.

242. Materials and Processes.

Credit 3 hours. An introductory study of materials and processes as applied to industrial materials with special emphasis on metals, plastics, woods and ceramics. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

256. Principles and Metallurgy of Welding.

Credit 3 hours. Theory and practice in oxy-fuel gas and electric arc welding processes with emphasis on preparation of joints, manipulation in various weld positions, and the selection and use of welding accessories and equipment. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

262. Principles of Technology.

Credit 3 hours. Prerequisite: Sophomore standing or permission of the Department Head. A course designed to help students perceive the interaction of science, technology, and society. Scientific theories and law are merged with technological skills through the study of mechanical, fluid, electrical, and thermal systems found in technological devices. Through experimentation, students learn that technology is the application of science to the solution of practical problems. Two hours of lecture and two hours of laboratory a week.

264. Industrial Fluid Power.

Credit 3 hours. Theory and practice of hydraulic and pneumatic power for industrial production. Functional examination of units: pumps, valves, boosters, etc. Simulated systems used to emphasize design and other industrial materials. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

291. Industrial Internship.

Credit 3 hours. Prerequisite: Sophomore standing and permission of the Department Head. This course is a cooperative venture between Southeastern Louisiana University and a variety of industries. It combines the student's academic and technical preparation at the university with actual on-the-job experiences in approved modern industrial enterprises. For three (3) hours credit a student must be employed a minimum of 20 hours per week during a regular semester and a minimum of 40 hours per week during the summer. Grades assigned on a Pass/Fail basis only. Grades assigned on a Pass/Fail basis only.

292. Independent Study.

Credit 3 hours. Prerequisites: A "B" average or recommendation by the faculty and approval of the Department Head. An honors course devoted to research and development through laboratory experimentation of selected problems of special interests. Enrollment limited. Grades assigned on a Pass/Fail basis only.

302. [204] Loss Prevention.

Credit 3 hours. Prerequisites: Industrial Technology 233, 242 or 256. Development of, and comprehensive consideration of, current principles, practices, methods, and equipment in modern industrial safety and accident prevention.

304. Facilities Planning and Design.

Credit 3 hours. Prerequisite: Industrial Technology 306 or permission of instructor. Principles, methods, and techniques for analyzing existing and proposed plant facilities. Problems in, and the relationships of, plant location, product analysis, product design, equipment selection, materials handling, plant arrangement and supplemental services.

306. Work Methods and Measurements.

Credit 3 hours. Prerequisite: Industrial Technology 111 and 242. Process charting, operations analysis, standard data, predetermined times, work sampling, time studies, and wage incentives. Three hours of lecture a week.

309. Special Topics.

Credit 3 hours. Organized class or individual instruction. May be repeated when topics vary for a maximum of six credit hours.

311. Industrial Design.

Credit 3 hours. Prerequisites: Industrial Technology 112, 215, and 242. A study of design principles as applied to systems design, product design, and machine-tool design. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

322. Materials Science and Metallurgy.

Credit 3 hours. Prerequisite: Industrial Technology 242. Study of the major materials used in industrial engineering, considering structure and properties, testing methods (destructive and nondestructive), and microscopic examination. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

331. Microcomputer Hardware.

Credit 3 hours. Prerequisite: Industrial Technology 236 or Computer Science 257 with any physics lab/lecture sequence that includes electricity and magnetism, or Department Head approval. The study of the applications of hardware microelectronics for industrial uses of the computer. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

351. Machine Tool Technology.

Credit 3 hours. Prerequisite: Industrial Technology 111 and 242. Principles and practices of metal machining involving lathes, shapers, millers, planers, and precision grinders. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

391. Industrial Internship.

Credit 3-12 hours. Prerequisite: Permission of Department Head. Students receive on-the-job work experience with selected and approved industrial firms. For three hours credit a student must be employed a minimum of 20 hours per week during a regular semester and a minimum of 40 hours per week during the summer semester. Course may be repeated for a maximum of 12 credit hours. Grades assigned on a Pass/Fail basis only.

402. Industrial Supervision.

Credit 3 hours. Prerequisite: Junior standing. Types of industrial organizations and supervisory systems; responsibility, authority, duties, and qualifications of industrial supervisors.

407. Statistical Quality Assurance.

Credit 3 hours. Prerequisite: Industrial Technology 306 and nine hours of Mathematics or permission of instructor. Principles and practices of quality control, theory of statistical sampling and related economic analysis, followed by control charts, acceptance and standard sampling plans, reliability, quality cost, and product liability.

408. Production Planning and Control.

Credit 3 hours. Prerequisite: Junior standing. Organization and control of manufacturing processes and equipment; operation sequence planning; economic consideration of equipment selection; tooling and producing an item from design to distribution.

409. Special Topics.

Credit 3 hours. Organized class or individual instruction. May be repeated when topics vary for a maximum of six credit hours.

442. Computer-Aided Manufacturing (CAM).

Credit 3 hours. Prerequisites: A 200-level Computer Science course and Industrial Technology 351. A course designed to teach the use of the computer and peripheral equipment to create the data base for programming the operation of manufacturing equipment such as lathes, milling machines, drilling machines, and robots. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

444. Industrial Robotics.

Credit 3 hours. Prerequisite: Industrial Technology 236, Industrial Technology 264, and a 200-level Computer Science course. An overview of the current robotics industry starting with a brief history, followed by a review of the basic terms used in the field. The operation, installation, and maintenance of pneumatic robot systems is included along with the operation and programming of the programmable controller. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

492H. Research and Development in Industrial Technology.

Credit 3 hours. Prerequisites: A "B" average or recommendation by the faculty and approval of the Department Head. An honors course devoted to research and development through laboratory experimentation of selected problems of specific interest. Course may be repeated for a total of six hours with no more than three hours in any one semester. Enrollment is limited. Grades assigned on a Pass/Fail basis only.

OCCUPATIONAL SAFETY AND HEALTH (OSH)

115. Introduction to Safety and Health.

Credit 3 hours. General safety and health concepts and terms, historical developments, program concepts and terms, legislative overview including worker's compensation law, problem identification, hazard recognition, evaluation and control concepts, and an introduction to measurement and evaluation.

120. Safety and Health Program Management and Administration.

Credit 3 hours. Prerequisite: Enrollment in or prior credit for OSH 115. This course will address the application of management principles and techniques to the management of safety and health and loss control programs. Topics will include planning, organizing, budgeting, resourcing, operating, implementing, and evaluating safety functions.

121. Design of Hazard Controls.

Credit 3 hours. Prerequisites: Current enrollment or prior credit for OSH 115. Application of scientific and engineering principles and methods to achieve optimum safety and health conditions through the analysis and design of process, equipment, products, facilities, operations, and environments. Topics include product, design, plant layout, construction, maintenance, pressure vessels and piping, mechanical systems, materials handling and storage, ventilation, power tools, electrical equipment, and transportation vehicles and systems.

122. Principles of Industrial Hygiene & Toxicology.

Credit 3 hours. This course will present the basic industrial hygiene principles of anticipation, recognition, evaluation, and control of workplace conditions as they relate to occupational health. Class discussion will focus on a variety of occupational hazards including air contaminants, chemical hazards, biological hazards, and physical hazards.

123. Fire Protection and Prevention.

Credit 3 hours. This course will present the basic principles of fire and fire prevention in the work place. Emphasis will be placed on evaluating existing and planned facilities from a fire and explosion standpoint, and applying the basic principles of hazard recognition, evaluation, and control when developing fire prevention and emergency response activities.

124. Ergonomics.

Credit 3 hours. Prerequisite: Enrollment in or prior credit for OSH 115. This course explores ergonomic design principles which involve the planning and adapting of equipment and tasks to promote the comfort and efficiency of workers. Topics will include human characteristics, physiology, and anthropometry and the application of these principles to workstations, design tools, and material handling procedures.

125. Environmental Laws and Regulations.

Credit 3 hours. An introduction to federal and state environmental regulations which impact industry. Major topics include hazardous waste management, disposal and cleanup, prevention of air, water, and soil contamination and environmental program management.

221. Safety Laws, Regulations, and Standards.

Credit 3 hours. This course will address the processes, sources, and applications for minimum safety requirements established by laws, regulations, standards, and codes. Major topics will include OSHA General Industry and Construction Standards, the enforcement of safety standards, and the role of NIOSH and ACGIH in the safety movement.

223. Safety in Chemical and Process Industries.

Credit 3 hours. The course presents the fundamentals of chemical and process industry safety. Major topics include toxic, fire, and pressure hazards inherent in chemical plants and petroleum refineries, and the methods used to identify, assess, and eliminate those hazards.

224. Construction Safety.

Credit 3 hours. The course will address the application of management principles, communication and human relations factors, safety/health rules, industry and federal standards, accident investigation, and the job planning phases in the construction environment.

PROCESS TECHNOLOGY (PTEC)

101. Introduction to Process Technology.

Credit 3 hours. An introduction to the field of Process Technology and the role of process operators within the plant. Major topics to be studied include operator performance and responsibilities, employer expectations, plant safety, responsible care and compliance with regulations, instrumentation, plant equipment and processes, and industrial process control.

131. Instrumentation I.

Credit 3 hours. An introduction to the common instrumentation components and their operation and their function within a control loop. Students will be introduced to pressure, temperature, level and flow measurement as well as controllers, valve positioners and relays. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

132. Instrumentation II.

Credit 3 hours. Prerequisites: Process Technology 131 and Computer Science 110. A detailed study of instrumentation as applied to industrial process control. Major topics to be studied include control concepts, functional structure of feedback control, sensors and transmission systems, controllers, process dynamics and tuning control systems. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

161. Plant Equipment.

Credit 3 hours. A study of industrial plant equipment, including their construction, principles of operation, and utilization within process systems. Equipment to be studied includes pumps, compressors, valves, instruments, boilers, furnaces, turbines, heat exchangers, and cooling towers. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

207. Statistical Quality Control.

Credit 3 hours. Prerequisites: Process Technology 242 and Mathematics 161. A study of the statistical quality control requirement of process industries. Major topics include internal and external customer/supplier relationship, total quality management, statistical methods of quality control, and computer software SPC/SQC programs.

242. Unit Operations.

Credit 3 hours. Prerequisites: Process Technology 101 and 161. A functional examination of the general types of processes found in the chemical and refining industries, including distillation and fractionation, reaction, absorptions, adsorption, extraction, stripping, cracking, alkylation, hydroprocessing, clarification and water treatment. Two hours of lecture and two hours of laboratory a week. Laboratory fee: \$15.00.

243. Industrial Process Control.

Credit 4 hours. Prerequisites: Process Technology 132 and 242 and Chemistry 101 and 103. An advanced study of the design and control of industrial processes. Students will be required to operate and monitor process plant simulators and troubleshoot system upsets. Two hours of lecture and four hours of laboratory a week. Laboratory fee: \$15.00.

263. Fluid Mechanics.

Credit 3 hours. Prerequisites: Process Technology 132 and Physics 191 and 193. A study of the principles of fluid mechanics which provide the theoretical foundation required for the design, construction, installation and operation of plant equipment and process units.

INTEGRATED SCIENCE AND TECHNOLOGY (ISAT)

592. Research and Development in Industrial Technology.

Credit 3 hours. Prerequisites: An overall "B" average or recommendation by the faculty and approval of the Department Head. A course devoted to research and development through laboratory experimentation of selected problems of specific interest. Course may be repeated for a total of six hours with no more than three hours in any one semester.

600. Applied Science Seminar I.

Credit 3 hours. Students in the program will be expected to take the two three-credit hour applied science seminars during their first two semesters in the program. The purpose of these seminars is to develop the student's research skills in an applied setting and to show students how interdisciplinary study will benefit their career aspirations. Students will be expected to examine the effects and applications of emerging technology in industry. Problem solving models and techniques will be illustrated and applied. Sharing of professional knowledge and expertise is expected in the flow of classroom interaction. Guest speakers from regional businesses and industries will be an integral part of these seminars.

601. Applied Science Seminar II.

Credit 3 hours. Prerequisite: Completion of ISAT 600. This seminar is a continuation of ISAT 600. The course is intended to further develop the students research skills through projects involving current technology. The course will continue to present students with a broad range of current industrial practices. It will also assist students in selecting their team-based project.

615. Technology in Industry and Society.

Credit 3 hours. Prerequisite: ISAT 600 or concurrent enrollment. This course investigates the historical evolution of technology for use in developing models appropriate for predicting future technological trends. The course provides technical understanding and communication skills needed across the disciplines of mathematics, chemistry and physics, industrial technology, and computer science. The course provides and understanding of the impact of technology on individuals, the global community and the environment.

625. Applications of Computing in Science and Technology.

Credit 3 hours. Prerequisite ISAT 600 or concurrent enrollment. Applications of computing in applied research labs, business, and industry settings. Topics include inter and intro-networking; information acquisition, storage and retrieval; process control systems; mathematical models; and chemical process control models.

635. Industrial Chemistry.

Credit 3 hours. Prerequisites: ISAT 600 or concurrent enrollment. This course will be of a survey nature. It will introduce the student to the importance of the chemical industry to our economy as a whole and inform the student about the role of the chemist in typical plant operations such as quality control and assurance, safety compliance, and research and development. In addition, the student will become acquainted with some important industrial processes in the chemical industry.

770. Thesis Project.

Credit 3 hours. Prerequisites: ISAT 600, 601 and approval of Program Coordinator. Students are required to complete 6 hours of thesis (ISAT 770) or a research project (ISAT 771). ISAT 770 is the thesis option. Thesis projects will investigate a significant interdisciplinary topic centered in the area of the student's concentration. The thesis is graded Pass/Fail. The student must enroll in the thesis course each semester that the thesis is in progress. .

771. Research Project.

Credit 3 hours. Prerequisite: ISAT 600, 601 and approval of Program Coordinator. Students are required to complete 6 hours of thesis (ISAT 770) or a research project (ISAT 771). ISAT 771 is the option to design and implement a research project. Research projects will investigate a significant interdisciplinary, applications-oriented topic centered in the area of the student's concentration. The research project is graded Pass/Fail. The student must enroll in the research project course each semester that the research is in progress



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