ENGINEERING TECHNOLOGY

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100. Introduction to Engineering Technology. Credit 3 hours. Introduction to a broad range of engineering technology topics and fields, such as mechanical design, engineering materials, machining, computers and programming, data analysis and graphing, robotics, and communications, discussion includes the roles, duties, responsibilities, professional ethics, professionalism, fundamental skills and knowledge required of engineering technologists.

132. Construction Materials and Methods. Credit 3 hours. Prerequisite: Engineering Technology 100. A study of the behaviors and performance of building materials and assemblies, as well as construction standards and constraints. Emphasis is placed on the understanding of the advanced engineering aspects of specific materials and assemblies used in commercial and industrial structures. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

202. Computer Applications. Credit 3 hours. Prerequisite: Mathematics 165. A study of the common computer applications used to solve technological problems. Software to be used includes Microsoft Office components, software tools for project management and logistic support, and visual programming languages.

205. Mathematical Methods for Engineering. Credit 3 hours. Prerequisite: Mathematics 200. A course on post-calculus mathematical techniques and methods specifically designed for engineering technologists. Topics include applied differential equations, matrics, determinants, statistics and probability.

212. Introduction to Programming. Credit 3 hours. Prerequisite: Mathematics 165. An introduction to applied programming in C for engineering technologists. Major topics include elements of computer organization, concepts of programming languages, data structures, and Object Oriented Programming using C++.

213. Electrical Circuits. Credit 3 hours. Prerequisite: Mathematics 165. A study of the fundamentals of electrical equipment and installations related to engineering technology. Topics include DC and AC power, electrical measurements, print reading, electrical wiring, application of network laws and theorems, nodal and mesh analysis for passive RLC circuits, transformers and polyphase circuits, illumination, heating, wiring codes and specifications. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

221. Programming for Technologists. Credit 3 hours. Prerequisite: Mathematics 165. An introduction to object oriented computer programming, data structures, basic algorithms, and basic elements of software engineering. Program coding using a high level language such as Java or similar.

225. Electronics I. Credit 3 hours. Prerequisite: Engineering Technology 213. Introduction to electronics including characteristics and applications of diodes, transistors (BJT and FET), logic gates, digital and analog integrated circuits, operational amplifiers, and active circuits using op amps as well as concepts of power electronics including inverters and converters. Analysis and design of analog electronic circuits involving rectifiers, amplifiers, oscillators and other components will also be discussed. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

226. Electronics II. Credit 3 hours. Prerequisite: Engineering Technology 225. Introduction to binary number systems, logic gates, Boolean algebra, combinational function simplification, sequential and combinatorial logic circuits involving flip flops, counters, registers, and memories. Programmable logic devices such as the FPGAs, PLAs, A/D and D/A conversion will also be discussed. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

231. Surveying I. Credit 3 hours. Prerequisite: Engineering Technology 100. Engineering principles and practices of surveying applied to instrumentation, computation, and construction site layout dealing with both commercial and residential construction. Two hours of lecture and two hours laboratory per week. Laboratory fee required.

232. Surveying II. Credit 3 hours. Prerequisite: Engineering Technology 231. Theory and supervised field practice in the layout of engineering and construction projects utilizing extensive surveying principles, applied science, mathematics, legal implications and computer applications. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

234. Concrete and Masonry Design. Credit 3 hours. Prerequisite: Engineering Technology 132. Discussion about materials, methods, constructability, equipment, drawings and specifications related to reinforced concrete and masonry structural elements such as beams, girders, slabs, post tension slabs, and columns in accordance with current AIC codes and standards. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

241. Introduction to Engineering Materials. Credit 3 hours. An introduction to engineering materials with focus on mechanical behaviors of materials, material properties, industrial applications, limitation and selection of materials. Topics include atomic structure and bonds, stress and strain analysis, engineering structures, environmental consideration, limitations and failures, and properties testing and measurement of materials. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

244. Construction Regulations, Contracts, and Specifications. Credit 3 hours. Prerequisite: Engineering Technology 132. A study of codes and specifications required by municipality, counties/parishes, and states as well as construction contracts and professional ethics. Topics include contractual relationships amongst construction parties, types of agreements, worker's compensation, insurance, and ethics in construction. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

271. Engineering Statics. Credit 3 hours. Prerequisites: Mathematics 200 and Physics 191. This course uses vector methods for the study of force, coupled and equivalent force systems, equilibrium of particles and rigid bodies, centroids, centers of gravity, moments of inertia, and virtual work. It includes analysis of simple structures such as trusses and beams, applications of dry friction models to belts and wedges and the method of virtual work.

283. Manufacturing Processes. Credit 3 hours. Prerequisite: Engineering Technology 241. This course serves as an introduction to a broad range of traditional and non-traditional manufacturing processes. Topics include casting and solidification processes, forming and shaping processes, material removal processes, joining processes, special processing and assembly technologies, engineering metrology and instrumentation, and other aspects of manufacturing.

305. Human Factors Engineering. Credit 3 hours. Prerequisite: Junior standing. Thos course provides the student with a basic knowledge of human factors design principles and the nature of human interaction with their environment. The course introduces cognitive engineering, ergonomics, system design, and the nature of human performance in the workplace.

320. Microprocessors and Interfacing. Credit 3 hours. Prerequisite: Computer Science 290. An introduction to principles of microprocessor and microcontroller operation, CPU, memory, buses and I/O interfaces. Topics include microcomputer-based system design, Windows programming, and interfacing. This course includes a design project. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

331. Commercial Construction Estimating I. Credit 3 hours. Prerequisites: Engineering Technology 100 and Mathematics 165. Fundamentals of construction estimating procedures, with analysis of light commercial construction prints and specifications to determine the quantity of materials, labor, equipment and overhead as well as profit as it relates to the bidding process. The use of traditional estimating practices and current computer software for the development of construction bids will also be discussed. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

332. Commercial Construction Estimating II. Credit 3 hours. Prerequisite: Engineering Technology 331. An advanced study of heavy construction estimating for commercial, civil, and industrial construction projects. Includes advanced mathematics to solve conceptual problems that determine the unit price, labor cost, detailed estimating, overhead allocation, bidding strategies, and bid formula. Also includes use of latest estimating software for the development of construction bids for simulated projects. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

336. Steel Design. Credit 3 hours. Prerequisite: Engineering Technology 132 and Mathematics 200. The application of principles of strength of materials to the design and analysis of structural steel beams, columns, trusses and frames, as well as connection and base plates in accordance with current AISC specifications. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

353. Total Quality Management. Credit 3 hours. Prerequisite: Industrial Technology 407. This course provides students with an understanding of managing a total quality environment to improve quality, reduce costs and improve productivity. Emphasis is placed on the management, creation, organization, and evaluation of quality systems necessary to assure organizational and functional compliance with stated quality system requirements of national and international standards.

355. Management of Technical Organizations. Credit 3 hours. Prerequisite: Mathematics 165. An introduction to industrial management principles. It covers topics in organizational, such as organizational strategy and conflict management; in technology management; such as technology transfer and new product development, and in human resources management, such as labor relations and legislation.

357. Auto Identification and Data Capture. Credit 3 hours. Prerequisite: Computer Science 173. This course provides the students with an understanding of different auto identification and data capture technologies and their applications in manufacturing and distribution industries. Topics include bar coding, radio frequency identification, magnetic stripe, voice data entry, radio data terminals, and optical character recognition. Two hours of lecture and two hours of laboratory per week.

371. Engineering Dynamics. Credit 3 hours. Prerequisite: Engineering Technology 271 or permission of Department Head. This course uses vector methods for the study of two-dimensional as well as three-dimensional kinematics and kinetics of particles, systems of particles, and rigid bodies. Topics include equations of motion, conservation of energy and momentum, principles of linear impulse and momentum, work and energy methods.

375. Applied Thermodynamics. Credit 3 hours. Prerequisite: Mathematics 200. An introduction to the fundamentals of gas concepts. gas measuring devices, and calibration of measuring instruments. Topics also include vapor and gas cycles, ideal gas mixtures, reading of pyschometric charts, determining fuel combustion efficiency of steam generating systems such as boilers and measuring of analyzing humid air and steam conditions including heat content. Basic concepts of Rankine cycle as the basis for steam and heat engine operations will also be introduced.

376. Applied Fluid Mechanics. Credit 3 hours. Prerequisites: Engineering Technology 371 and 375. this course provides a comprehensive introduction to the basics of fluids and fluid mechanics as well as applications in engineering and science. Topics include fluid statics and dynamics, fluid energy and flow measuring devices, fluid components and systems.

381. Engineering Materials. Credit 3 hours. Prerequisite: Engineering Technology 241. This course covers advanced topics in analysis of engineering materials and design of mechanical systems. Main focus will be given to mechanical behavior and mechanics of engineering materials, including fracture and failure as well as strength analysis. Traditional methods and Finite Element Modeling and Analysis (FEM/FEA) are used. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

385. Mechanical Design. Credit 3 hours. Prerequisites: Engineering Technology 241 and 271. This course covers kinematic analysis and design of mechanisms, analysis of machine elements in terms of mechanical behavior of materials, stress concentration, combined stresses, fracture, and fatigue.

386. Machines and Controls. Credit 3 hours. Prerequisite: Engineering Technology 213. An introductory control and instrumentation course applied to machine control. Topics include electrical measurements and instrumentation, motors and generators and their control, feedback control systems, and programmable logic controllers. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

390. Engineering Economics. Credit 3 hours. Prerequisite: Junior standing. This course provides basic economic knowledge for analyzing financial performance of engineering projects. It includes the study of design economics, time value of money, depreciation, taxes, capitalization and amortization, replacement analysis, and risk analysis techniques.

410. Signals and Systems. Credit 3 hours. Prerequisite: Engineering Technology 205 or permission of Department Head. This course covers signal and system analysis. Topics include analysis techniques for signals and systems in both continuous and discrete time, signal representation using Fourier series and transforms, Convolution, sampling and Z-transforms, Laplace transform methods, system definitions and properties.

425. Control and Automation. Credit 3 hours. Prerequisites: Engineering Technology 205 and 410 or permission of Department Head. This course covers control systems analysis and design. Topics include time and frequency domain modeling and response, actuators and sensors for controlling programmable logic controllers, design of compensators, and use a Matlab for control system analysis. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

441. Construction Planning and Scheduling. Credit 3 hours. Prerequisites: Engineering Technology 132 and Engineering Technology 331. An introduction to the methods and procedures used in planning and scheduling commercial construction projects.

Topics include critical path methods (CPM), program evaluation and review (PERT), and PRIMAVERA. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

442. Construction Inspection. Credit 3 hours. Prerequisites: Engineering Technology 100 and Engineering 132. This course discusses construction inspection, functions, responsibilities, authority and technical requirements related to construction industry. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

443. Foundation and Soil Mechanics. Credit 3 hours. Prerequisites: Engineering Technology 100, Engineering Technology 132, and Mathematics 200. This course covers theory and application of soil properties, selection and methods of installation of foundations and other soil supported structures, including footings, piles, caissons, and retaining structures. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

445. Commercial Architecture. Credit 3 hours. Prerequisite: Engineering Technology 132. Analysis and solution to 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 per week. Laboratory fee required.

446. Construction Systems. Credit 3 hours. Prerequisite: Engineering Technology 132. A study of the economic and functional application of construction equipment including the types of equipment, ownership and operational costs as well as equipment scheduling and selection. Design, installation, and operation of materials and equipment in the HVAC and plumbing systems for residential and commercial construction with also be discussed. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

448. Construction Hydraulics. Credit 3 hours. Prerequisite: Mathematics 200. A study of physical phenomena of hydraulics and hydraulic forces with application of fundamental laws and empirical formula. Pressures and forces on submerged areas, buoyancy, flow in a closed conduit, open channels, and fluid measurements will also be discussed. Two hours of lecture and two hours of laboratory per week. Laboratory fee required.

465. Industrial Simulation and Modeling. Credit 3 hours. Prerequisite: Industrial Technology 406. This course introduces computer simulation methods and techniques used for analysis of manufacturing and service operations encountered in manufacturing industries. Topics include industrial simulation software, data analysis, optimization and how to simulate a complex system.

478. HVAC. Credit 3 hours. Prerequisites: Engineering Technology 213, Engineering Technology 375, and Engineering Technology 385. An introduction to HVAC (heating, ventilating, and air conditioning). Topics include heat transfer devices, AC motors and compressors, residential and commercial refrigeration and heating, heat load calculation, and HVAC system layout and control.

480. Advanced Strength of Materials. Credit 3 hours. Prerequisites: Engineering Technology 271 and Engineering Technology 381. A study of advanced topics of stress/strain analysis using Finite Element Method (FEM) with application to machine design. Topics include mechanical behaviors of materials and structures subjected to various loading conditions, such as tension, compression, torsion, and flexure. Deflection of prismatic members, columns, and combined stresses will be discussed.

484. Advanced Manufacturing Technologies. Credit 3 hours. Prerequisite: Engineering Technology 283 or permission of Department Head. This course covers advanced and non-traditional manufacturing processes, such as the application of lasers and other modern methods in manufacturing processes, high speed machining technologies, advanced treatment of metal forming processes, and particulate material processing. Students are required to participate in research and development of a specific manufacturing area of particulate material processing. Students are required to participate in research and development of a specific manufacturing area of interest.

488. Robotics and Automation. Credit 3 hours. Co-requisite: Engineering Technology 386. An introduction to robotics and automation. Topics include manipulators and mobile robotics, actuators and sensors, industrial control systems, and robot and system integration. Two hours of lecture and tow hours of laboratory per week. Laboratory fee required.

490. Seminar. Credit 1 hour. Prerequisite: Senior standing. Discussion of social, ethical, and professional issues. Presentations and research on topics of current interest in engineering and technology. Grades assigned on a Pass/Fall basis only.

492. Project Management. Credit 3 hours. Prerequisites: Mathematics 200 and Senior standing. This course covers the principles of project management for technologists and the use of project management software. Topics include the concepts involved in review techniques, network modeling, and the critical path method. In addition, linear programming and network optimization models with application to solve project management problems will be discussed.

493. Senior Design I. Credit 3 hours. Co-requisites: Engineering Technology 492 and Senior standing. This course is the first part of the Capstone Design Project. It covers engineering ethics, teamwork and leadership, problem solving, oral and written technical communication, project management, and the integration of ET with real-world examples such as case studies in computer systems, robots, and mechatronics. All team projects are subject to instructor's approval.

494. Senior Design II. Credit 3 hours. Prerequisites: Engineering Technology 493 and Senior standing. This course is the second part of Capstone Design Project. It builds on and extends the themes covered in ET 493, culminating in a written Capstone Design Project and an oral presentation to the ET faculty and students at the end of the semester. The capstone project can take a variety of forms, such as analytical, computational, design-based, or experimental.