

## Design Drafter Technology (DDT)

**113. Architectural Drafting.** Credit 3 hours. Prerequisite: IT 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 per week. A laboratory fee is required for this course. (Fall, Spring)

**114. Technical Illustration.** Credit 3 hours. Prerequisites: IT 111 and 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 per week. A laboratory fee is required for this course. (Varies)

**211. Piping Drafting.** Credit 3 hours. Prerequisites: IT 112 and 264. Piping design and drafting fundamentals as used in process industries such as refineries and petrochemical plants. The study, use and drafting of pipes, fittings, flanges, valves, equipment and structural systems using the latest industry-standard software. Students will use industry standards to create schematic, plan, elevation, isometric, spool, and 3-D drawings of various process piping components/systems. Two hours of lecture and two hours of laboratory per week. A laboratory fee is required for this course. (Fall)

**212. Parametric Modeling of Machine Parts/Assemblies.** Credit 3 hours. Prerequisite: IT 111. Feature based parametric modeling of simple and complex machine parts, sub-assemblies, and assemblies. Fully documenting design projects according to industry standards, including video presentations, animations, project documentation, change orders, file management for design projects, reverse engineering and 3D printing. Two hours of lecture and two hours of laboratory per week. A Laboratory fee is required for this course. (Spring)

**215. Light Commercial Building Drafting.** Credit 3 hours. Prerequisites: IT 111 and DDT 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 per week. A laboratory fee is required for this course. (Varies)

**216. Civil Drafting Technology.** Credit 3 hours. Prerequisite: IT 111. Basic concepts and techniques of civil technology, including leveling; longitude and latitude; map scales; symbols, directions; legal descriptions; plot plans, contours; profiles and highway cut and fill. Students will use Computer-Aided Design (CAD) software to complete projects relating to interpretation of survey data, profiles and cross sections, land subdivision, site and grading plans, and basic earthwork calculations. Two hours of lecture and two hours of laboratory per week. A laboratory fee is required for this course. (Varies)

**218. Special Topics in Drafting.** Credit 3 hours. Prerequisites: A 2.0 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. (Varies)

**311. Process Piping/Plant Design.** Credit 3 hours. Prerequisite: DDT 211. The general concepts and principles of process plant layout and design, including plant layout specifications, equipment and component arrangement, and basic stress analysis using 3-D parametric plant design software. Two hours of lecture and two hours of laboratory per week. A laboratory fee is required for this course. (Fall)

**312. Advanced Machine Design Drafting.** Credit 3 hours. Prerequisite: IT 111 or ET 111. Feature based parametric modeling of complex machine parts, sub-assemblies, and assemblies. Fully documenting design projects according to ANSI industry standards. Development of various design aspects including: video presentations, animations, project documentation, change orders, file management for design projects, reverse engineering and 3D printing. Two hours of lecture and two hours of laboratory per week. A laboratory fee is required for this course. (Varies)

**316. Advanced Computer-Aided Drafting and Design.** Credit 3 hours. Prerequisite: IT 215 or ET 111. An advanced study of the terminology, concept and theory of solid model development and

subsequent rapid prototyping. Includes an in-depth coverage of 3-D modeling, the production of these models through rapid prototyping technologies, and their relationship to traditional manufacturing techniques. Two hours of lecture and two hours of laboratory per week. Credit cannot be given for both IT 216 and DDT 316. A laboratory fee is required for this course. (Fall)

**411. Industrial Design.** Credit 3 hours. Prerequisites: IT 112, 242, and DDT 316. A study of design principals as applied to product design, machine tool design and rapid prototyping. The use of graphic techniques for the interpretation and solution of design problems. Design for manufacturability with the use of concurrent engineering tools, CAD. Two hours of lecture and two hours of laboratory per week. Credit cannot be given for both IT 311 and DDT 411. A laboratory fee is required for this course. (Spring)

**415. Fundamentals of MicroStation and GIS.** Credit 3 hours. Prerequisite: DDT 216. A study of the concepts, tools, and features found in the MicroStation drafting environment and the evolution and basic operation of GIS. Two hours of lecture and two hours of laboratory per week. A laboratory fee is required for this course. (Varies)

## Industrial Technology (IT)

**100. Introduction to Technology.** Credit 3 hours. The evolution of technology in industry and its impact. This course addresses the concentrations offered in the industrial technology program, focusing on employment opportunities, career paths, technological growth, salaries and job descriptions as well as technical, ethical and professional requirements. The three concentrations of the Industrial Technology manufacturing curriculum will be defined and emphasized throughout the course. (Fall, Spring)

**111. Engineering Drafting with Computer Assisted Design.** Credit 3 hours. Study of terminology, concepts, theories, and fundamental skills necessary to understand and operate a CAD system, and specifically using the system to graphically communicate through the basic elements of drafting, including orthographic projection, sectioning, dimensioning, isometric and oblique pictorial representation, standard symbols, simple auxiliary views, precision and tolerancing. Two hours of lecture and two hours of laboratory per week. A laboratory fee is required for this course. (Fall, Spring)

**112. Descriptive Geometry.** Credit 3 hours. Prerequisite: IT 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 per week. A laboratory fee is required for this course. (Fall, Spring)

**202. Fundamentals of Supervision.** Credit 3 hours. Prerequisite: Sophomore standing. A basic study of the role of the supervisor in modern organizations, including the basic knowledge required to effectively supervise, interact with and motivate employees of various demographics in a variety of current work environments. (Spring)

**205. Preventive/Predictive Maintenance and Supervision.** Credit 3 hours. Prerequisite: IT 100. A study of the methods required to develop, implement, and supervise a comprehensive preventive/predictive maintenance management program to minimize equipment and system breakdown. Major topics include methods of monitoring critical equipment and systems, predicting machine failures, scheduling equipment maintenance, and the use of computer software in preventive/predictive maintenance programs. (Fall)

**209. Special Topics.** Credit 3 hours. Organized class or individual instruction. May be repeated when topics vary for a maximum of six credit hours. (Varies)

**211. Codes and Other Standards.** Credit 3 hours. Study of the structure, scope, intent, and application of commonly referenced U.S. and International industrial codes and standards used in industrial design/engineering, fabrication, and construction, including procedure and personnel qualification/certification, product acceptance standards, QA and QC requirements. Regulatory implications of codes adopted by states for the purpose of regulating the design, fabrication, and/or operation of fired and unfired pressure vessels will also be studied. Codes and standards published

by AWS, ASME, API, IIW, ASTM, ASNT, and others will be used during the course to illustrate and instruct the students in the principles of code compliance and application. (Fall, Spring)

**215. 3D Rendering Using CAD Software.** Credit 3 hours. Prerequisites: IT 112. An introductory study of terminology, concepts, theories, and fundamental skills necessary to understand and operate a 3D CAD system. Students will learn how to create three-dimensional models inside a computer software system and use that model to create professional Engineering and Technical drawings. Two hours of lecture and two hours of laboratory a week. A laboratory fee is required for this course. (Fall)

**221. Nondestructive Testing.** Credit 3 hours. Study of the theory, limitations, and practice of Nondestructive Testing methods including visual, dye penetrant, magnetic particle, radiography, acoustic emission, ultrasonic, phased array ultrasonic, PMI, magnetic resonance, metrology, and others. Course will include theory of procedure development, and NDE personnel qualification and certification in accordance with American Society for Nondestructive Testing (ASNT) and American Welding Society (AWS) as well as principles of code compliance and application. A laboratory fee is required for this course. (Fall, Spring)

**223. Introduction to Basic Electricity and Electronics.** Credit 3 hours. Prerequisite: MATH 162. 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. A laboratory fee is required for this course. (Fall, Spring)

**236. Advanced Electronics.** Credit 3 hours. Prerequisite: IT 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. A laboratory fee is required for this course. (Fall, Spring)

**241. Manual Welding.** Credit 3 hours. Practical applications of manual cutting, fabrication, and welding process technology to complete a fabricated project. Students will be introduced to Shielded Metal Arc Welding, Oxy-Fuel Cutting, Oxy-Fuel Welding, and Gas Tungsten Arc Welding which will provide for a working knowledge suitable for supervision of welding practitioners. This course will use Welding Procedure Specifications (WPS) and project designs (one structural and one pipe) provided by the instructor, to improve practical fabrication and welding skills of the student. Each project to be assessed for ability to meet all requirements of the project design as well as the quality of the fabrication and welding required to complete the project. A laboratory fee will be required for this course. (Fall)

**242. Materials and Processes.** Credit 3 hours. Prerequisite: IT 100. 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 per week. A laboratory fee is required for this course. (Summer, Fall, Spring)

**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 per week. A laboratory fee is required for this course. (Fall, Spring)

**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 per week. (Varies)

**264. Industrial Fluid Power.** Credit 3 hours. Prerequisite: IT 111. 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 per week. A laboratory fee is required for this course. (Summer, Fall, Spring)

**281. Industrial Design using Emerging Technologies.** Credit 3 hours. Prerequisite: IT 215. An advanced study of emerging design technologies critical to manufacturing, engineering, and industrial practices. Students will develop technical skills necessary for using design equipment such as 3D

printers, 3D scanners, CNC machines, and other developing technologies. Two hours of lecture and two hours of laboratory per week. A laboratory fee is required for this course. (Spring)

**291. Industrial Internship.** Credit 3 hours. Prerequisites: 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. (Summer, Fall, Spring)

**292. Independent Study.** Credit 3 hours. Prerequisites: A "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 special interests. Enrollment limited. Grades assigned on a Pass/Fail basis only. (Varies)

**308. Supervision of Production Planning and Controlling.** Credit 3 hours. Prerequisite: IT 205. A problem-based approach to the organization, control, and supervision of production planning. The course also addresses reliability centered maintenance programs and automatic data collection relative to production and inventory control. (Fall)

**309. Special Topics.** Credit 3 hours. Organized class or individual instruction. May be repeated when topics vary for a maximum of six credit hours. (Varies)

**312. Principles and Applications of Industrial Codes and Standards.** Credit 3 hours. Prerequisite: IT 256. Study of the industrial codes and standards used in industrial design/engineering, fabrication, and construction around the world. This course will include procedure and personnel qualification/certification, product acceptance standards, QA and QC requirements. Students will develop an understanding of the structure, scope, intent, and application of commonly used codes and standards. Codes and standards published by AWS, ASME, API, IIW, ASTM, ASNT, and others will be used during the course to illustrate and instruct the students in the principles of code compliance and application. Two hours of lecture and 2 hours of laboratory per week. A laboratory fee is required for this course. (Fall, Spring)

**322. Materials Science and Metallurgy.** Credit 3 hours. Prerequisite: IT 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. A laboratory fee is required for this course. (Fall, Spring)

**331. Industrial Control Systems.** Credit 3 hours. Prerequisites: IT 236 and 264. The study and the application of microprocessor-based control systems in industrial operations. Two hours of lecture and two hours of laboratory per week. A laboratory fee is required for this course. (Spring)

**333. Fundamentals for Mechanical Design.** Credit 3 hours. Prerequisite: ET 111 or IT 111. Study and applications of ANSI fundamentals for mechanical product design. Topics include engineering design process, 3D parametric modeling, working drawings prototyping, and geometric dimensioning and tolerancing pertaining to ASME Y14.5. Two hours of lecture and two hours of laboratory per week. (Spring)

**341. Automatic and Semiautomatic Welding.** Credit 3 hours. Prerequisite: IT 241. Practical applications of automatic and semiautomatic welding process technology to complete a fabricated project. Student will be introduced to Flux Core Arc Welding, Gas Metal Arc Welding, and Submerged Arc Welding which will provide for a working knowledge suitable for supervision of welding practitioners. Each project to be assessed for ability to meet all requirements of the project design as well as the quality of the fabrication and welding required to complete the project. A laboratory fee is required for this course. (Spring)

**351. Machine Tool Technology.** Credit 3 hours. Prerequisites: IT 111 and 242 or ET 111 and 283. Principles and practices of metal machining involving lathes, shapers, millers, planers, and precision grinders. Two hours of lecture and two hours of laboratory per week. A laboratory fee is required for this course. (Fall, Spring)

**381. Welding Joint Design.** Credit 3 hours. Prerequisites: IT 211 and MATH 162 or MATH 175. Study of the theory and practice of determining code-compliant welding joint designs for pressure and vacuum retaining systems, structural systems, connections, weld profiles, and welding Symbolology. Course will include use of static and dynamic considerations for weld efficiency, material thickness, and joining process selection to meet both owner and code considerations. This course will draw upon courses in design, code & standards, Engineering Materials and metallurgy, Nondestructive

Testing, and welding/joining, previously completed by the student to provide a foundation for this course. A laboratory fee is required for this course. (Fall)

**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. Completion of all 100- and 200- level major courses are required before internship is taken. 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. (Summer, Fall, Spring)

**402. Industrial Supervision.** Credit 3 hours. Prerequisites: Junior standing and credit for or enrollment in MGMT 351. The competencies and knowledge required of industrial supervisors to effectively manage production, groups and work teams in a dynamic workplace comprised of diverse populations. (Summer, Fall)

**403. Senior Project CWI/CWS.** Credit 3 hours. Prerequisites: Senior Standing and Department Head Approval. This Senior Project brings together previous courses completed by the student into a comprehensive look at professions in Inspection or Supervision. This course will use the American Welding Society Body of Knowledge in either Inspection or Supervision (Student's Choice) to blend previously completed courses for a strong understanding in Welding Inspection and Supervision. Each student completing this course will be expected to demonstrate a comprehensive knowledge of welding topics sufficient to be certified by AWS as either a CWI or CWS. (Varies)

**405. Work Methods and Measurement.** Credit 3 hours. Prerequisite: IT 351. A study of the work methods and measurement concepts and techniques that are common to modern industry, including productivity improvement, work methods, work measurement, labor reporting, ergonomics, incentives and alternative methods for increasing productivity. (Fall, Spring)

**406. Facilities Planning and Design.** Credit 3 hours. Prerequisite: IT 405. A study of principles, methods, and techniques for analyzing existing and proposed facilities to achieve improvements in productivity. Major topics include strategic facilities planning; plant location; product, process and schedule requirements; materials handling and costing. Two hours of lecture and two hours of laboratory per week. A laboratory fee is required for this course. (Fall, Spring)

**407. Six Sigma Industrial Quality.** Credit 3 hours. Prerequisites: MATH 175 or 241 or permission of Department Head. An approach to quality that focuses on the improvement of processes. Topics include teams, strategic planning, cause-and-effect diagrams, Pareto diagrams, basic statistics, probability, control charts, project management, flow diagrams and failure modes and effects analysis. (Summer, Fall, Spring)

**409. Special Topics.** Credit 3 hours. Organized class or individual instruction. May be repeated when topics vary for a maximum of six credit hours. (Varies)

**442. CAD/CAM/Robotics.** Credit 3 hours. Prerequisites: IT 331 and 351 and a 200-level Computer Science Course. A course designed to cover the application of Computer-Aided Design, Computer-Aided Manufacturing and robotics in modern industrial settings. Two hours of lecture and two hours of laboratory per week. A laboratory fee is required for this course. (Fall)

**444. Computer-Integrated Manufacturing (CIM).** Credit 3 hours. Prerequisite: IT 442. This course will cover the integration of various automated systems and peripherals into a functioning and flexible manufacturing system. The interfacing of the central control computer and robot systems into a workable manufacturing cell will also be covered. Two hours of lecture and two hours of laboratory per week. A laboratory fee is required for this course. (Spring)

**492H. Research and Development.** 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 of selected problems. Course may be repeated for a total of six hours with no more than three hours in any one semester. Grades assigned on a Pass/Fail basis. (Fall)

**625. Automated Design and Manufacturing.** Credit 3 hours. Prerequisites: DDT 316, IT 442 or permission of the ISAT Coordinator. A study of design principles and rapid prototyping through solid model development. Students will develop solid models, convert them to machine tool software for code development and produce prototypes with CAM and 3-D printing. Two hours of lecture and two hours of laboratory work each week. (Varies)