

Computer-Aided Technology

CAT 1000 Special Topics

Prerequisites: Math 0103 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures

VARIABLE 1-6 Credits The student will demonstrate specified competencies in subject areas not covered in other computer-aided design and design courses, but which are beneficial in providing a better understanding of drafting and design. Enrollment may be repeated with a change of topic. This course satisfies the computer proficiency requirement.

CAT 1043 Engineering Principles

Prerequisites: Math 0103 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures

3 Credits The student will use computational techniques and computer-aided drawing to create, analyze and graphically represent solutions to architectural and engineering problems, reflecting national, international and professional norms and standards. The student will be able to describe and demonstrate familiarity with the functions and responsibilities of research, manufacturing, construction and quality assurance involved in the solutions of a variety of engineering and architectural problems. This course satisfies the computer proficiency requirement.

CAT 1053 Manufacturing Materials and Processes

Prerequisites: CAT 1043 or by evaluation. § Criteria for evaluation is in division office.

3 Credits Students will learn basic concepts of the properties, behaviors and proper application of materials used in manufacturing and construction. The student will discuss and demonstrate various manufacturing, fabrication, assembly, handling and finishing processes. This course satisfies the computer proficiency requirement.

CAT 1113 Unmanned Vehicle Systems

Prerequisites: Math 0103 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measure

3 Credits Students will be introduced to the history, missions, capabilities, types, configurations, subsystems, and the disciplines needed for UVS development and operation.

CAT 1123 UVS Operations

Prerequisites: CAT 1113

3 Credits Students will demonstrate the proper way to operate Unmanned Vehicle Systems. This includes pre-mission check list, mission planning and logging, safety/liability consideration and emergency procedures. Students will be working in the field and in the classroom conducting simulated and real life missions.

CAT 1133 Airspace and Regulations

Prerequisites: Math 0103 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures

3 Credits The course will examine the components and objectives of the National Airspace System. Emphasis will be placed on regulations pertaining to UAS flight operations.

CAT 1214 Computer Aided Design (CAD)

Prerequisites: Math 0103 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures

4 Credits The student will learn and demonstrate the proper use of computer-aided design software as a design tool in fields such as Engineering, Architectural and Multimedia. Emphasis will be on computer-aided design fundamentals such as creating, editing and printing of 2D computer-aided design documents. The student will demonstrate his or her understanding of the structure, use and development of computer-aided design documents by correctly creating, using and storing computer-aided design documents. This course satisfies the computer proficiency requirement.

CAT 1253 CAD 3D Parametric Modeling

Prerequisites: Math 0203 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures

3 Credits This course is an introduction to 3D parametric modeling techniques and concepts. The student will create 3D models and assemblies from 2D sketches using parametric dimensioning and constraints. This course satisfies the computer proficiency requirement.

CAT 1313 Introduction to Geographic Information System (GIS)

Prerequisites: Math 0103 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures

3 Credits Students will learn fundamental concepts in Geographic Information System (GIS). The student will be introduced to introductory content on typical business and technical applications, data, software, and techniques used to accomplish GIS projects. Students receive hands-on experience with global positioning system (GPS) hardware and ArcGIS software. This course satisfies the computer proficiency requirement.

CAT 1323 Introduction to Spatial Technology

Prerequisites: Math 0103 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures

3 Credits The course focuses on technologies being used to locate, inventory and analyze locations, Geographic Information Systems, Global Positioning Systems, telemetry and photogrammetry and a brief introduction to Satellite-Based Remote Sensing.

CAT 1413 CAD Hardware and Software

Prerequisites: Math 0103 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures

3 Credits The student will demonstrate his or her ability to understand the purposes and advantages of using networks, the Internet and operating systems in computer-aided design. The student will be introduced to computer-aided design hardware, software, networks, and operating systems as an integral part of computer-aided design productivity. This course satisfies the computer proficiency requirement.

CAT 1513 Digital Imaging

Prerequisites: CS 1103 or CAT 1413 or by evaluation. § Criteria for evaluation is in division office.

3 Credits Students will develop both technical skills and creative techniques in a project-based learning environment. Many aspects of digital imaging will be applied including digital cameras and scanners, image retouching and manipulation, selection, layering, color correction, channels, paths, and filters. This course satisfies the computer proficiency requirement.

CAT 2000 Special Topics

Prerequisites: MATH 0103 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures

VARIABLE 1-6 Credits The student will demonstrate competencies with subjects not covered in other program courses. Each course will cover a specific topic and may be repeated with a change in content.

CAT 2013 Geometric Dimensioning and Tolerancing

Prerequisites: CAT 2540 (minimum of three credit hours)

3 Credits This course will introduce the student to the concepts of geometric dimensioning and tolerancing. The coursework will focus on recognition and understanding of geometric tolerancing terms and symbols. The student will interpret and apply the basic geometric tolerancing techniques.

CAT 2023 Design Mechanics

Prerequisites: Math 1613, 15 credit hours of CAT, PHYS 1114 or PHYS 1314

3 Credits The student will analyze coplanar force systems and calculate moments of inertia, centroids, tensile stresses. The student will demonstrate an understanding of the relationship between stress and strain, basic properties of materials and shear, bending and moment diagrams. This course is designed as an applied static's and strength of materials course for technicians utilizing algebra, trigonometry and analytic geometry. This course satisfies the computer proficiency requirement.

CAT 2113 CAD Management and Standards

Prerequisites: CAT 1253 or by evaluation. § Criteria for evaluation is in division office.

3 Credits The student will demonstrate the ability to manage and maintain a Computer-Aided Design System. The student will demonstrate his or her ability to handle problems in the Computer-Aided Design office related to organization, finances, communication, hardware, software, training and limited resources by providing written, structured solutions to Computer-Aided Design office problems. The student will be able to develop, apply and maintain a Computer-Aided Design standards manual defining the operational parameters necessary for a profitable and efficient Computer-Aided Design operation. Emphasis will be on organizing data input, drawing output, data exchange and networking. This course satisfies the computer proficiency requirement.

CAT 2123 Digital Fabrication

Prerequisites: MATH 0203 or adequate math placement; CAT 1214 or CAT 1253 or CAT 2543.

3 Credits The course is an in-depth exploration of the world of digital fabrication. Students will create projects by utilizing fabrication equipment such as 3D scanning, 3D Printers, Computer Numerical Control (CNC) machines and metrology tools. This course satisfies the computer proficiency requirement.

CAT 2163 CAD Automation

Prerequisites: CAT 1214; MATH 0203 or adequate math placement.

3 Credits The student will demonstrate the ability to manage and maintain a Computer-Aided Design System by customization, programming and automation. This course satisfies the computer proficiency requirement.

CAT 2313 Introduction to Spatial Analysis

Prerequisites: Math 0203 or adequate math placement, CAT 1313 or by evaluation. § Criteria for evaluation is in division office.

3 Credits This course is designed to expose students to various components of spatial analysis. Emphasis is placed on modeling and decision making with the use of spatial data. Upon completion, students will be able to utilize common GIS techniques to solve complex spatial problems. This course satisfies the computer proficiency requirement.

CAT 2334 Plane Surveying

Prerequisites: MATH 1613 or by evaluation. § Criteria for evaluation is in division office.

4 Credits The student will be introduced to maps, survey measurement techniques and computations related to distances, elevations and traverse surveys. The student will study topics related to topographical, construction and boundary surveying. Field laboratory work is required. This course satisfies the computer proficiency requirement.

CAT 2540 Applications in CAD

Prerequisites: CAT 1043 and CAT 1214 or by evaluation. § Criteria for evaluation is in division office.

VARIABLE 1 The student will use a Computer-Aided Design System to produce solutions to typical problems encountered in industry. The student will demonstrate his or her ability to understand the principles of design, visualization, projection, analysis and product quality by producing a set of working drawings and presenting their work to a group of their peers. This course may be repeated with a different content. This course satisfies the computer proficiency requirement.

CAT 2703 Practicum

Prerequisites: 12 hours of CAT or by evaluation. § Criteria for evaluation is in division office.

3 Credits The Practicum is a course designed to monitor students in an on-site job location. The student will report to and receive supervision by the employer during the course of the semester. The student will demonstrate the ability to work effectively in a commercial setting, toward satisfying objectives prescribed by the instructor and the participating employer. Work objectives will be consistent with meaningful career learning experiences. This course satisfies the computer proficiency requirement.

CAT 2924 Design Project

Prerequisites: 15 hours of CAT credits

4 Credits In this capstone course of the Computer-Aided Technology Program the student will demonstrate the collected knowledge, skills and techniques acquired in the program courses by creating and presenting a representative project to a panel of students, instructors and representatives from industry. The project must be an original design of the student. The project must reflect the standards relative to the project's nature and the program emphasis. The student must assemble and create components, choose the proper presentation medium, and present the project in a professional manner. This course satisfies the computer proficiency requirement.