Computer-Aided Technology

**CAT 1000 SPECIAL TOPICS**
Prerequisites: Math 0103 or adequate math placement test score; 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.

**CAT 1043 ENGINEERING PRINCIPLES**
Prerequisites: Math 0103 or adequate math placement test score; 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.

**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.

**CAT 1214 COMPUTER AIDED DESIGN (CAD)**
Prerequisites: Math 0103 or adequate math placement test score; 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.

**CAT 1253 CAD 3D MODELING**
Prerequisites: Math 0103 or adequate math placement test score, CAT 1043 and CAT 1214 or by evaluation. § Criteria for evaluation is in division office.

3 Credits The student will use Computer-Aided Design software to create 3-dimensional graphics. The student will demonstrate the ability to define 3D workspaces and viewing positions. The student will use various 3D drawing tools to create 3D objects as surfaced and solid models. The student will also develop rendered bitmap images and use them in professional drawings. Emphasis will be placed on the creation of 3D models from 2D data and 2D detail drawings from 3D data.

**CAT 1313 INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEM (GIS)**
Prerequisites: Math 0103 or adequate math placement test score; 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.

**CAT 1323 INTRODUCTION TO GLOBAL POSITIONING SYSTEMS (GPS)**
Prerequisites: Math 0103 or adequate math placement test score; ENGL 0203, adequate placement score, or by meeting determined placement measures

3 Credits The student will demonstrate the ability to use GPS technology for collecting, processing, and analyzing spatial and non-spatial data. The student will learn and apply GPS theory and techniques through computer laboratory assignments, and field survey experiences.

**CAT 1413 CAD HARDWARE AND SOFTWARE**
Prerequisites: Math 0103 or adequate math placement test score; 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.

**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.
CAT 2000 SPECIAL TOPICS  
Prerequisites: Math 0103 or adequate math placement test score; 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.  

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.  

CAT 2163 CAD PROGRAMMING AND AUTOMATION  
Prerequisites: MATH 0203 or Adequate math placement test score; CAT 1253 or by evaluation. § Criteria for evaluation is in division office.  
3 Credits The student will use embedded programming languages such as AutoLISP and Visual Basic to automate the drafting and design process. Emphasis will be placed on the development of parametric drawing programs. The student will demonstrate his or her ability to understand Computer-Aided Design automation by writing computer programs that can be used in the Computer-Aided Design industry.  

CAT 2313 INTRODUCTION TO SPATIAL ANALYSIS  
Prerequisites: Math 0203 or adequate math placement test score, 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.  

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.  

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.  

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.  

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.