Computer-Aided Technology - Computer-Aided Design (AAS)

Associate in Applied Science

Minimum of 60 credit hours

Computer-aided design (CAD) is the tool designers, engineers, architects and other skilled workers use to create 3D models and 2D construction and manufacturing drawings. CAD technicians are in high demand in a number of different industries. And, you could be, too, with an associate degree in computer-aided design from Oklahoma City Community College. Architectural firms, engineering firms, manufacturers, construction companies, municipalities and government agencies are all relying on skilled CAD technicians to keep up with the constant changes in technology. You could design planes, automobiles or buildings with a computer-aided design degree from OCCC.

Course Sequence

Course ID	Course Name	Credits	Type	Min Gd
Term 1				
CS 1103	Introduction to Computers and Applications	3	Major	
SCL 1001	Success in College and Life	1	Life Skills	
CAT 1214	Computer Aided Design (CAD)	4	Major	
Term 2				
MATH 1483	Functions and Modeling	3	Gen Ed	
ENGL 1113	English Composition I	3	Gen Ed	
CAT 1043	Engineering Principles	3	Major	
Term 3				
CAT 1253	CAD 3D Parametric Modeling	3	Major	
CAT GEN COMM	OSRHE Approved Gen Ed Communications or English Course	3	Gen Ed	
Term 4				
CAT 1053	Manufacturing Materials and Processes	3	Major	
MATH 1613	Trigonometry	3	Support	
Term 5				
POLSC 1113	American Federal Government	3	Gen Ed	
CAT 2540	Applications in CAD	3	Major	
Term 6				
PHYS 1114	College Physics I	4	Gen Ed	
CAT 2123	Digital Fabrication	3	Major	
CAT 2540	Applications in CAD	OR^		
CAT 2703	Practicum	3*	Major	
Term 7				
HIST 1483	U.S. History to 1877	OR	Gen Ed	
HIST 1493	U.S. History 1877 to Present	3	Gen Ed	
CAT 2540	Applications in CAD	OR^		
CAT 2703	Practicum	*	Major	
Term 8				
CAT 2163	CAD Automation	3	Major	
CAT 2023	Design Mechanics	3	Major	
CAT 2924	Design Project	4*	Major	
Term 9				
CAT 2924	Design Project	*	Major	
FA ELEC	Faculty Approved Elective	2	Support	
***16-week course offered during two 8-week terms** **^Take CAT 2540 (8-week course) in Term 5 and again in Term 7 with a different project emphasis OR take CAT 2540 in Term 5 AND CAT 2703 (16-week course) over Terms 6-7**				

Course Grouping

Major Courses: (35 credit hours) Computer-Aided Technology: CAT 1043, CAT 1053, CAT 1214, CAT 1253, CAT 2023, CAT 2123, CAT 2163, CAT 2540 (6 hrs: Take twice with different project emphasis) or CAT 2540 (3 hrs) & CAT 2703, CAT 2924, CS 1103
General Education Courses: (19 credit hours)
English: ENGL 1113; Any course that meets Oklahoma State Regents for Higher Education requirements for a general education Communications course (OSRHE: ENGL 1213, ENGL 1233, COM 1123, COM 2213)
History: HIST 1483 or HIST 1493
Mathematics: MATH 1483
Political Science: POLSC 1113
Physics: PHYS 1114
Life Skills Courses: (1 credit hour) Life Skills: SCL 1001
Support Courses: (5 credit hours)
Mathematics: MATH 1613
Electives: (2 Credits) Any CAT, CS or ENGR course, Also courses from DMD list: DMD 1513, DMD 1183, DMD 1053, DMD 2053, DMD 2143, DMD 2153, DMD 2533, DMD 2633, DMD 2733, DMD 2773, DMD 2783 or the following ART courses: ART 1123, ART 1183, ART 1203, ART 1213, ART 1233, or ART 1243. Other courses may be approved by the Program Faculty.

Program Notes

Notes: This Technical and Occupational program is designed to prepare students to enter the job force following completion. See Technical and Occupational Programs in the general information section of the catalog.

Degree Program Course Descriptions

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 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 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 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 2540 - Applications in CAD
Prerequisites: CAT 1043 and CAT 1214 or by evaluation. § Criteria for evaluation is in division office.
Credit 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.

CAT GEN COMM - OSRHE Approved Gen Ed Communications or English Course
3 Credits Students should select one 3 credit course: ENG 1213, ENG 1233, COM 1123, or COM 2213.

CS 1103 - Introduction to Computers and Applications
Prerequisites: MATH 0103 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits This hands-on course affords students a basic understanding of computers and their application. Upon completion of this course, the student will be able to demonstrate the ability to use a computer operating system, an office suite, productivity tools, as well as the Internet at an introductory level. Advanced Standing is available. This course satisfies the computer proficiency requirement.

ENGL 1113 - English Composition I
Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits The student will write well-developed compositions which demonstrate the principles of unity, coherence, and organization and which contain specific details and vivid language. The students will locate

library material and incorporate researched materials into compositions.

FA ELEC - Faculty Approved Elective
3 Credits Faculty approved elective

HIST 1483 - U.S. History to 1877
Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits After analyzing events in American history from 1400 to 1877 in such areas as revolution, geographic and social mobility, political reform, government precedents and war, students will be able to identify patterns of present day mobility, describe governmental operations in their society and help resolve conflict in society based on the student's search for change, precedents, and conflict in the American past. A general education requirement.

HIST 1493 - U.S. History 1877 to Present
Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits After analyzing events in American history from 1877 to the present in such areas as geographic and social mobility, political reform, government precedents and war, students will be able to identify patterns of present day mobility, describe governmental operations in their society and help resolve conflict in society based on the student's search for change, precedents, and conflict in the American past. A general education requirement.

MATH 1483 - Functions and Modeling
Prerequisites: MATH 0313 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits The student will demonstrate: an understanding of the general concepts of relation and function and specifically of polynomial, rational, exponential and logarithmic functions; the ability to solve systems of equations by utilizing matrices and determinants; and, the ability to solve practical problems using algebraic and digital techniques.

MATH 1613 - Trigonometry
Prerequisites: Pre or Corequisite: MATH 1483 or MATH 1533 or adequate math placement and ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits The student will evaluate trigonometric functions and their inverses using both degree and radian measure; graph trigonometric functions and their transformations; identify properties of trigonometric functions; verify and apply trigonometric identities; solve trigonometric equations; solve problems involving right and oblique triangles, vectors, and indirect measurement; and identify and graph polar curves.

PHYS 1114 - College Physics I
Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures and MATH 1483 or higher or APPM 1223, within the last two years or by evaluation. § Criteria for evaluation is in division office.
4 Credits Students will demonstrate their understanding of useful concepts of kinematics and dynamics, energy and momentum, waves and sound, fluids and thermodynamics by (1) developing numerical and graphical descriptions of physical phenomena, (2) numerically predicting the results of physical occurrences, and (3) applying laboratory skills to analyze real situations. Numerical computations will utilize algebra and basic trigonometry where appropriate.

POLSC 1113 - American Federal Government
Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures
3 Credits A study of the principles, structure, processes and functions of the United States federal government.

SCL 1001 - Success in College and Life
Prerequisites: ENGL 0106 or adequate reading/writing assessment scores
1 Credit Students will learn best practices for academic, career, and personal success. Students will discover their individual strengths, interests, and values to create a personalized plan; select and utilize resources that are applicable to their growth and success; and engage as active and responsible members of the academic community. This course should be taken during a student's first semester of college work at Oklahoma City Community College and is a required course in degree plans to satisfy the Life Skills requirement.