COMPUTER-AIDED DESIGN (CAD)

CAD 100 (3 credit hours)
Introduction to Computer Aided Design
Applies fundamental principles and capabilities of CAD, basic drafting conventions, and operations. Provides an in-depth study of computer aided drafting commands, terminology, command utilization, and skill development. Lecture: 1 credit (15 contact hours). Laboratory: 2 credits (60 contact hours).
Attributes: Digital Literacy, Course Also Offered in Modules, Technical
Components: LAB: Laboratory, LEC: Lecture

CAD 102 (4 credit hours)
Drafting Fundamentals
Explores the fundamentals of drafting in the use of equipment through measurement of lines, angles, circles, arcs, and irregular curves; alphabet of lines; freehand sketching; geometric constructions; orthographic projection; characteristics of lines and planes; lettering; and dimensioning techniques. Lecture/Lab: 4.0 credits (90 contact hours).
Attributes: Technical
Components: LEC: Lecture

CAD 108 (3 credit hours)
Introduction to Surveying
Introduces the elements of surveying including measurements, distance corrections, leveling, angles, area computation, computer calculations, topographic surveying, electronic distance measuring instruments, construction surveying, GPS, and GIS. Lecture: 3 credits (45 contact hours).
Attributes: Technical
Components: LEC: Lecture

CAD 112 (4 credit hours)
Engineering Graphics
Explores lines and planes as they relate to orthographic projection to show the size and shape of objects, as well as for descriptive geometry in solving advanced problems. Includes application of principles and graphic elements of sectioning; techniques involved in oblique projections, axonometric projections, and perspective drawings; and dimensioning techniques and symbol usage common to all drafting disciplines. Lecture: 4 credits (90 contact hours).
Pre-requisite: CAD 102 with a grade of C or better or Approval of Instructor.
Attributes: Technical
Components: LEC: Lecture

CAD 120 (4 credit hours)
Introduction to Architecture
Introduces a practical approach to architectural drafting using board and/or computer aided drafting methods as it relates to residential and commercial architecture, specifications, and structural systems including wood, masonry, concrete, and steel. Lecture: 4 credits (90 contact hours).
Pre-requisite: CAD 100 or CAD 103 with a grade of C or better or approval of the Instructor.
Attributes: Technical
Components: LEC: Lecture

CAD 200 (4 credit hours)
Intermediate Computer Aided Drafting
Produce advanced two- and three-dimensional object drawings with CAD software to learn the techniques of drafting, layering, and symbols associated with one or more design applications, and calculate perimeters, areas, and mass associated with the drawings. Lecture: 4 credits (90 contact hours).
Pre-requisite: CAD 100 or CAD 103 with a grade of C or better or approval of the Instructor.
Attributes: Technical
Components: LEC: Lecture

CAD 201 (4 credit hours)
Parametric Modeling
Introduces parametric modeling and design of a CAD workstation in exploring the techniques associated with drafting and design using parametric modeling software. Introduces creation of parametric models and explores associative function and flexibility of concurrent part design. Lecture: 4 credits (90 contact hours).
Attributes: Technical
Components: LEC: Lecture

CAD 212 (4 credit hours)
Industrial Drafting Processes
Explores weldment design, welding symbols, welding processes, and fabrication techniques, tool and die, and jig and fixture drawings. Includes design specifications, pattern drawings, casting, forming processes, and mechanical drawing principles in relation to the manufacturing industry. Covers screw-thread design and related fastening concepts as they relate to manufactured items and construction. Lecture: 4 credits (90 contact hours).
Pre-requisite: CAD 100 or CAD 103 with a grade of C or better or approval of the Instructor.
Attributes: Technical
Components: LEC: Lecture

CAD 216 (4 credit hours)
Building Information Modeling
Introduces Building Information Modeling (BIM), an intelligent model-based process that provides insight to help plan, design, construct, manage buildings and infrastructure through three dimensional models, and generate construction drawing sheet sets. Creates structures for analytical purposes such as visualization, quality take off, cost estimating, scheduling, coordination and facility management across various fields, including architectural, structural and mechanical, electrical, and plumbing. Using BIM technology enables discovery of potential conflicts between these fields. Integrated Lecture: 2 credits (30 contact hours). Integrated Laboratory: 2 credits (60 contact hours).
Attributes: Technical
Components: LAI: Integrated Laboratory, LEI: Integrated Lecture

CAD 220 (4 credit hours)
Architectural Design
Applies the theory of architectural design and presentation techniques. Deals with site selection, use of materials in design, spatial relationships, and aesthetics. Explores traditional and contemporary design, designers, processes, and historical milestones. Uses board and computer techniques to illustrate interiors and exteriors of student designs. Lecture: 4 credits (90 contact hours).
Pre-requisite: CAD 120 with a grade of C or better or approval of Instructor.
Attributes: Technical
Components: LEC: Lecture

CAD 222 (4 credit hours)
Mechanical Design
Explores the design principles, mechanical adaptation, and drawing practices involved in the development of mechanical working drawings and the design principles in various manufacturing disciplines; gear drawing and design, and cam and follower drawing and design; mechanical assemblies, machine design, power transmission, bearings, and seals in assemblies. Involves shop processes in these mechanical designs. Lecture: 4 credits (90 contact hours).
Pre-requisite: CAD 100 with a grade of C or better or approval of Instructor.
Attributes: Technical
Components: LEC: Lecture

CAD 230 (4 credit hours)
Construction Techniques
Covers the elements for constructing standard residential and commercial structures; essentials of standard construction details, which illustrate the various construction methods involved in wood frame, solid masonry, masonry veneer, concrete, and steel construction. Includes the development of a portfolio for these techniques. Lecture: 4 credits (90 contact hours).
Pre-requisite: CAD 120 with a grade of C or better or approval of Instructor.
Attributes: Technical
Components: LEC: Lecture

CAD 240 (4 credit hours)
Advanced Dimensioning and Measurement
Presents an in-depth study of advanced industrial dimensioning principles, tolerances, fits, and A.N.S.I. standards. Explores shape and geometric characteristics of parts through geometric dimensioning and tolerancing through drawing application and study. Lecture: 4 credits (90 contact hours).
Pre-requisite: CAD 100 with a grade of C or better or approval of the Instructor.
Attributes: Technical
Components: LEC: Lecture

CAD 252 (4 credit hours)
Commercial Detailing
Explores commercial drafting building codes, building structure, materials, and structural drawing and detailing. Emphasizes calculations to determine appropriate structural members. Lecture: 4 credits (90 contact hours).
Pre-requisite: CAD 120 with a grade of C or better or Approval of the Instructor.
Attributes: Technical
Components: LEC: Lecture

CAD 262 (4 credit hours)
Working Drawings
Prepare a set of working drawings to be used in a portfolio that shows mastery of the architectural drawing processes and knowledge of building construction techniques. Lecture: 4 credits (90 contact hours).
Pre-requisite: CAD 120 with a grade of C or better or approval of the Instructor.
Attributes: Technical
Components: LEC: Lecture

CAD 291 (2 credit hours)
Special Problems
Allows the student to gain intermediate experience in their perspective fields through projects and tasks assigned by the instructor based on applications the student may one day experience as a professional. Sets the foundation for more in-depth projects that will be included in the student's future portfolio. Focuses on various assignments and curriculum determined by the program instructor. Laboratory: 2 credits (60 contact hours).
Pre-requisite: Permission of the Instructor.
Attributes: Technical
Components: LAB: Laboratory

CAD 292 (4 credit hours)
Industrial Applications
Emphasizes the development of a portfolio of mechanical drawings specific to the occupational opportunities in specific geographical locations. Focuses on various assignments and curriculum as determined by the program instructor. Lecture: 4 credits (90 contact hours).
Pre-requisite: Approval of instructor.
Attributes: Technical
Components: LEC: Lecture

CAD 293 (1-4 credit hours)
Special Problems
Allows the student to gain intermediate experience in their perspective fields through projects and tasks assigned by the instructor and based on applications the student may one day experience as a professional. Sets the foundation for more in-depth projects that will be included in the student's future portfolio. Focuses on various assignments and curriculum as determined by the program instructor. Lab: 1.0 - 4.0 credits (30-120 contact hours).
Pre-requisite: Approval of Program Coordinator.
Attributes: Technical
Components: LAB: Laboratory

CAD 298 (1-3 credit hours)
Practicum
Provides supervised work experiences related to the student's educational objectives. Students participating in the Practicum do not receive compensation. Practicum: 1.0-3.0 credits (45-135 contact hours).
Pre-requisite: Approval of Program Coordinator.
Attributes: Technical
Components: PCM: Practicum

CAD 299 (1-3 credit hours)
Cooperative Education
Provides supervised on-the-job work experience related to the student's educational objectives. Students participating in the Co-op Education program receive compensation for their work. Co-op: 1.0-3.0 credits (45-135 contact hours).
Pre-requisite: Approval of Program Coordinator.
Attributes: Technical
Components: COP. Co-op