ENGINEERING (ENGR)

Engineering 011
Basic Blueprint Reading
Units: 2.
Class hours: 32 lecture total.
Prerequisite: None.
Advisory reading level: 3.
Reading and interpreting blueprints for manufacturing. (Same as Manufacturing Technology 011.)

Engineering 012
AEC Blueprint Reading
Units: 2.
Class hours: 32 lecture total.
Prerequisite: None.
Advisory reading level: 3.
Reading and interpreting blueprints for Architecture, Civil Engineering, Construction, (AEC). Information in this course provides preparation for more advanced AEC coursework. Recommended for students with no prior course(s) in blueprint reading. May be repeated.

Engineering 027
Electronic Drafting
Units: 3.
Class hours: 16 lecture, 80 laboratory total.
Prerequisite: None.
Advisory reading level: 3.
Fundamentals of electronic drafting. Includes symbols, schematics, cable drawings, logic diagrams, printed circuit board layout, and electromechanical design. Recommended preparation: Engineering 051.

Engineering 051
Basic Technical Drawing
Units: 3.
Class hours: 16 lecture, 80 laboratory total.
Prerequisite: None.
Advisory reading level: 3.
Principles of mechanical drawing including projections, dimensions, and conventions, utilizing sketches and computer drafting program. Designed for students with no prior mechanical drawing experience.
Suggested preparation: Engineering 183 (may be taken concurrently).

Engineering 103
Solidworks Basic Solid Modeling
Units: 3.
Class hours: 48 lecture, 32 laboratory total.
Prerequisite: None.
Advisory reading level: 2.
Introductory course in parametric solid modeling. This course will include a solid modeling overview, solid model construction techniques (extrude, revolve, sweep, primitive, fillet, chamfer, etc.), including the preparation of individual solid components and basic solid model assemblies. (Same as Manufacturing Technology 103.) May be repeated.

Engineering 104
Solidworks Intermediate Solid Modeling
Units: 3.
Class hours: 48 lecture, 32 laboratory total.
Prerequisite: Manufacturing Technology 083 or Engineering 103.
Advisory reading level: 2.
Intermediate course for solid modeling. Includes a review of the introductory class and changes to the Solidworks interface. Instruction in the use of intermediate Solidworks part modeling skills such as assembly modeling and sub-assemblies is included. (Same as Manufacturing Technology 104.) May be repeated.

Engineering 105
Solidworks Advanced Solid Modeling
Units: 3.
Class hours: 48 lecture, 32 laboratory total.
Prerequisite: Engineering 104.
Advisory reading level: 2.
Advanced course for solid modeling includes a review of the intermediate class
and changes to the Solidworks interface. Instruction in the use of Solidworks part modeling, assembly modeling, sub-assemblies, advanced photoworks and advanced animator emphasized. (Same as Manufacturing Technology 105.) May be repeated.

Engineering 110
Advanced CAD Applications
Units: 0.5-4.
Class hours: Arranged.
Prerequisite: None.
Advisory reading level: 3.
Individual skill development for advanced students desiring to learn special applications using college licensed computer drafting and design software. Each 0.5 unit of credit requires 24 laboratory hours.
Suggested preparation: Engineering 184. Open entry/open exit. Grade: CR/NCR only.

Engineering 112
Society and the Built Environment
Units: 3.
Class hours: 48 lecture total.
Prerequisite: None.
Advisory reading level: 3.
An introductory course that explores the far reaching impacts of society on the built environment. A multidisciplinary examination of Western and Non-Western society's ethics, economics, culture, processes, technology and tools on trends and developments on the built environment.

Engineering 114
Geometric Dimensioning and Tolerancing
Units: 3.
Class hours: 48 lecture total.
Prerequisite: None.
Advisory reading level: 3.
Drawing interpretation utilizing geometric dimensioning and tolerancing (ANSI Y14.5) as applied in engineering, manufacturing, and inspection. Suggested preparation: Prior or concurrent enrollment in Engineering 011 or Engineering 122. (Same as Manufacturing Technology 114.)

Engineering 115
Cooperative Work Experience Education-Occupational
Units: 1-4.
Class hours: Arranged.
Prerequisite: None.
Advisory reading level: 3.
Supervised paid or volunteer experience in student's major including new or expanded responsibilities. One unit credit for each 5 hours worked per week to a maximum of 4 units for 20 hours worked per week each semester. Limitation of 16 units in occupational cooperative education courses. Students must be enrolled in a minimum of 7 units including 4 units for Engineering 115. May be repeated. Grade:
CR/NCR only.

Engineering 122
Engineering Drawing
Units: 3.
Class hours: 16 lecture, 80 laboratory total.
Prerequisite: None.
Advisory reading level: 3.
Extended review of basic skills of engineering drawing principles. Study of manufacturing processes, projections, intersections and developments, utilizing sketches and computer drafting program.
Suggested preparation: Engineering 051 and 183 (Engineering 183 may be taken concurrently).

Engineering 124
Advanced Drawing
Units: 3.
Class hours: 16 lecture, 80 laboratory total.
Prerequisite: None.
Advisory reading level: 3.
Advanced experiences in engineering drawing and design. Includes fasteners, cams and gears, working drawings, utilizing sketches and computer drafting program.
Suggested preparation: Engineering 122 or 125.

Engineering 125 (CAN ENGR 2)
Engineering Graphics
Units: 3.
Class hours: 16 lecture, 80 laboratory total.
Prerequisite: Engineering 051 and Mathematics
160.
Advisory reading level: 3.
Technical drawing and descriptive geometry fundamentals. Includes projection theory, dimensioning, tolerancing, section, design and graphical mathematics, utilizing sketches and computer drafting program.
Suggested preparation: Engineering 183 (may be taken concurrently).

Engineering 142
Architecture/Civil Engineering/ Construction (AEC) Drafting Standards
Units: 4.
Class hours: 48 lecture, 80 laboratory total.
Prerequisite: Engineering 183.
Advisory reading level: 3.
Basic AEC graphic standards using computer drafting. Topics include plans, elevations, sections, schedules, structures, abbreviations, lettering, symbols and linetypes.
Recommended preparation Engineering 012 and 184.

Engineering 148
Introduction to Mechanical, Industrial, Electrical Engineering
Units: 2.
Class hours: 32 lecture, 16 laboratory total.
Prerequisite: None.
Advisory reading level: 3.
Introduction to Mechanical, Industrial, Electrical and related areas of Engineering. Includes an overview of academic programs, career information and preparation requirements, virtual or in person field trips, and guest speakers.

Engineering 149
Introduction to Architecture/Civil Engineering/Construction (AEC)
Units: 2.
Class hours: 32 lecture, 16 laboratory total.
Prerequisite: None.
Advisory reading level: 3.
Introduction to the Architectural, Civil Engineering, Construction (AEC) fields. Includes an overview of academic programs, career information and preparation requirements, virtual or in person field trips, and guest speakers.

Engineering 154
Architecture/Civil Engineering/ Construction (AEC) and AutoCAD Drafting
Units: 3.
Class hours: 32 lecture, 64 laboratory total.
Prerequisite: None.
Advisory reading level: 3.
This course will focus on AutoCAD, including the Architectural Desktop. Applications include Architectural, Civil Engineering, and Construction drawings/documents. Drawing setup and printing to scale will be stressed.
Suggested preparation:
Engineering 183 and 184.

Engineering 183
AutoCAD I - Computer Aided Drafting
Units: 3.
Class hours: 32 lecture, 64 laboratory total.
Prerequisite: None.
Advisory reading level: 3.
A first course in computer drafting using AutoCAD software. Topics include: display and file management, units, entities, object selection, advanced editing, layers, dimensions, text, graphic exchange.

Engineering 184
AutoCAD II - Computer Aided Drafting
Units: 3.
Class hours: 32 lecture, 64 laboratory total.
Prerequisite: None.
Advisory reading level: 3.
Intermediate course in the use of AutoCAD software. Topics include blocks, hatches, attributes, inquiry, and 3-D introduction. Recommended preparation: Engineering 183.

Engineering 185
AutoCAD III - Computer Aided Drafting
Units: 3.
Class hours: 32 lecture, 64 laboratory total.
Prerequisite: None.
Advisory reading level: 3.
Advanced course in the use of AutoCAD software. Topics include DXF format, scripts, macros, customizing and creating image tile menus. Recommended preparation:Engineering 184.

Engineering 186
AutoCAD 3-Dimensional Drawing
Units: 3.
Class hours: 32 lecture, 64 laboratory total.
Prerequisite: None.
Advisory reading level: 3.
Use of AutoCAD's 3-dimensional software. Includes 3-D models, extruding to 3-D, coordinate space, filter, and dynamic viewing. Recommended preparation:
Engineering 184.

Engineering 187
Advanced 3-D AutoCAD
Units: 3.
Class hours: 32 lecture, 64 laboratory total.
Prerequisite: None.
Advisory reading level: 3.
Advanced use of AutoCAD's 3-Dimensional software. Includes: merging of models, advanced modeling, calculations, 3-dimensional rendering and presentation.
Suggested preparation: Engineering 186.

Engineering 188
Machine Technology Survey
Units: 3.
Class hours: 32 lecture, 96 laboratory total.
Prerequisite: Successful completion or concurrent enrollment in Engineering 011, 051; Manufacturing Technology 011; or Automotive Technology 002 or 006.
Advisory reading level: 3.
Machine tool setup and operation for students who desire general knowledge of machine tools and processes. All the basic machine tools are used. Not intended for Manufacturing Technology majors. (Same as Manufacturing Technology 188.)

Engineering 191
Civil CAD Concepts
(Formerly Intergraph MicroStation I)
Units: 3.
Class hours: 32 lecture, 64 laboratory total.
Prerequisite: None.
Advisory reading level: 3.
Fundamental principles and operation of the Intergraph MicroStation computer aided drafting and design system emphasizing Civil Engineering applications, to create, modify, store and plot graphic data.

Engineering 193
MicroStation 3-D
Units: 3.
Class hours: 32 lecture, 64 laboratory total.
Prerequisite: None.
Advisory reading level: 3.
Theory, concepts, techniques and practices
of three dimensional design using Intergraph MicroStation. Topics include: surfaces, solids, shade, shadow and color.
Suggested preparation: Engineering 191.

Engineering 201
Architectural Practice
Units: 5.
Class hours: 48 lecture, 96 laboratory total.
Prerequisite: None.
Advisory reading level: 3.
Course provides “real world” practical knowledge needed to research information, make decisions, develop a basic design, experience the process of working through a project, and understand how various activities are related in the scope of a typical small project. Suggested preparation: Engineering 142, 112 and 149.

Engineering 205
Civil Digital Computations
Units: 3.
Class hours: 32 lecture, 64 laboratory total.
Prerequisite: Engineering 183.
Advisory reading level: 3.
Introduction to the theory of AutoCAD engine in civil engineering. Included topics: CAD customization for civil engineers; digital computation methods in statistics and solving algebraic equations; primary combined and complex elements; CAD engine deliverables; complex shapes and libraries.

Engineering 228
Descriptive Geometry
Units: 3.
Class hours: 16 lecture, 80 laboratory total.
Prerequisite: None.
Advisory reading level: 3.
Application of the concepts of orthographic protection to the solution of three-dimensional problems arising in the various branches of engineering. Introductory computer aided drafting/design concepts or applications.
Suggested preparation:
Engineering 122 or 125.

Engineering 235 (CAN ENGR 8)
Statics
Units: 3.
Class hours: 48 lecture total.
Prerequisite: Physics 217 and Mathematics
185 (both may be taken concurrently).
Advisory reading level: 3.
The first part of mechanics, as applied to static force systems and equilibrium conditions occurring in engineering problems. Includes some graphical methods and the use of diagrams as an aid to algebraic solutions. Utilizes SI metrics.

Engineering 250 (CAN ENGR 12)
(CAN ENGR 6 = ENGR 250+250L)
Electric Circuits
Units: 3.
Class hours: 48 lecture total.
Prerequisite: Mathematics 280, and Physics
227 (both may be taken concurrently).
Advisory reading level: 3.
Ohm’s and Kirchhoff’s Laws, useful theorems for circuit analysis, RC, RL, and RLC circuits, phasors and steady-state sinusoidal analysis, and polyphase circuits.

Engineering 250L
(CAN ENGR 6 = ENGR 250+250L)
Electric Circuits Laboratory
Units: 1.
Class hours: 48 laboratory total.
Prerequisite: Engineering 250 or concurrent enrollment.
Advisory reading level: 3.
Selected laboratory exercises in engineering circuit analysis. Resistive, RL, RC, and RLC circuits, and circuit analysis theorems.

Engineering 281 (CAN ENGR 4)
Properties of Engineering Materials
Units: 3.
Class hours: 48 lecture total.
Prerequisite: Chemistry 209 and Physics 217.
Advisory reading level: 3.
Microscopic and macroscopic structure of metals. Improvement of properties of metals by alloying and heat treatment. Effects of high temperature and corrosion upon metals. Study of metal fatigue, wood, plastic and concrete.