

# ARCHITECTURAL TECHNOLOGY/CIVIL ENGINEERING (607)

## 607-110 - Civil Drafting Fundamentals

Students develop computer-aided drafting techniques, technical knowledge and skills used in the production of drawings related to site improvements. Areas of study include map types, uses, and interpretation; plotting open and closed traverses; construction of contour lines from field data; plotting land profiles; determination of land areas and volumes; calculation of ground slopes; earth work cut and fill plotting; preparation of legal descriptions of land; developing drainage plans; and drawing construction plans for public utilities. A background in fundamental blueprint reading and/or drafting skills is recommended. (Prerequisites: Completion of or concurrent enrollment in 607-176 AutoCAD I; 804-195 College Algebra with Applications)

4 Credit hours

36 Lecture hours

72 Lab hours

## 607-114 - Structural Drafting

Provides the necessary knowledge and develops the basic structural drafting skills necessary for entry-level positions in the construction industry. Students analyze structural drawings from each of the principal structural trades: concrete, steel, masonry and wood. Students prepare plans for commercial and industrial buildings with CAD techniques. Drawing types addressed are framing plans, plan and section, fabrication drawings and bills of material. Students define terms and methods common to each of the major types of building methods. (Prerequisite: 607-116 Architectural Technology and Drafting)

4 Credit hours

36 Lecture hours

72 Lab hours

## 607-116 - Architectural Technology and Drafting

Introductory course in architectural drafting emphasizing print reading, manual and computer aided drafting in both 2D and 3D environments. Students develop an architectural design through sketching and manual drafting. The design is incorporated into a building information model (BIM) to create construction drawings. Drawings include floor plans, elevations, sections, details and schedules. Landscape architecture will be introduced to the students to create a site plan for the building. Students are introduced to industry requirements such as building codes and covenants. Introduction and adoption of current industry trends are emphasized throughout the students work. Students prepare presentation drawings to showcase their building and site design. Previous drafting skills desired. (Prerequisite: Completion of or concurrent enrollment in 607-178 Revit)

4 Credit hours

18 Lecture hours

108 Lab hours

## 607-122 - Mechanical Construction

Addresses the fundamental concepts of principal mechanical systems for buildings. Apply basic design principles of heating, air conditioning, ventilation, plumbing, electrical power distribution, and lighting design. Students learn to interpret codes, prints and specifications pertinent to mechanical systems. Introduces LEED (Leadership in Energy and Environmental Design) and Green Building Rating Systems. Information is presented on sustainable building practices which can be incorporated into project design, construction, operation and demolition. Applications of BIM and IPD are introduced and applied throughout the course. (Prerequisite: Completion of or concurrent enrollment in 804-195 College Algebra with Applications)

3 Credit hours

36 Lecture hours

36 Lab hours

## 607-124 - Construction Estimating

Teaches students the basics of construction estimating with an emphasis on quantity takeoff procedures for both detailed and conceptual estimates. Additional topics include types of estimates, types of contracts and scheduling methods. Students use spreadsheets and industry standard estimating software to prepare detailed estimates from paper working drawings and electronic model files. Emphasis on industry trends are applied throughout the course including BIM and IPD. (Prerequisite: 607-114 Structural Drafting or dean consent)

2 Credit hours

18 Lecture hours

36 Lab hours

## 607-131 - Structural Analysis 1

Provides an understanding of the relationship between the external forces applied to a structure and the resulting action on the components of the structure. Topics of study include vector analysis, resultant of forces, moments, force couples, truss analysis, and deflection in beams. (Prerequisite: Completion of or concurrent enrollment in 804-195 College Algebra with Applications)

3 Credit hours

36 Lecture hours

36 Lab hours

## 607-132 - Structural Analysis 2

Provides an understanding of the relationship between the external forces applied to a structure and the resulting action on the components of the structure. Topics of study include moment of inertia, stress in a structural member due to force or thermal changes, bending stress, and deflection in beams. (Prerequisites: 607-131 Structural Analysis 1; Completion of or concurrent enrollment in 804-196 Trigonometry with Applications)

3 Credit hours

36 Lecture hours

36 Lab hours

## 607-135 - Construction Surveying

Students apply fundamental principles of surveying to the use of surveying instruments. Includes measurement, differential leveling, traversing, stadia, introduction to total stations, computations with computer software and introduction to GIS. To supplement classroom instruction, students solve field problems working as a surveying crew and using surveying equipment. (Prerequisite: Completion of or concurrent enrollment in 804-195 College Algebra with Applications)

3 Credit hours

36 Lecture hours

36 Lab hours

**607-137 - Site Development**

Students prepare a site plan for a typical residential and industrial lot including structure, location, paving, parking design, drainage considerations, and erosion control measures and landscaping. Includes the drafting of plans for a subdivision including survey maps, plot maps, drainage plans and presentation drawings. Students gather survey information and incorporate the data into a site design. (Prerequisite: 607-110 Civil Drafting Fundamentals)

3 Credit hours

36 Lecture hours

36 Lab hours

**607-140 - Soils and Foundations**

Explores the fundamental concepts of soil composition and structure, properties of fine-grained soil, compaction, soil classification, soil investigation, test and analysis, nuclear moisture-density relationship, bearing ratio, percolation, and seismograph exploration. Includes the testing of materials used in the various fields of construction. Introduces and observes the principal means of performing destructive and nondestructive tests through field trips to testing laboratories and classroom activities. (Prerequisite: Completion of or concurrent enrollment in 804-195 College Algebra with Applications)

3 Credit hours

18 Lecture hours

72 Lab hours

**607-151 - Technical Problems**

Students prepare a commercial design project under a prescribed set of criteria utilizing knowledge of previous courses in design with various construction materials and methods, including concrete, steel, wood, etc. Emphasizes practical projects and solutions. (Prerequisites: 607-110 Civil Drafting Fundamentals; 607-114 Structural Drafting; 607-122 Mechanical Construction; 607-131 Structural Analysis 1; 607-140 Soils and Foundations)

4 Credit hours

36 Lecture hours

72 Lab hours

**607-176 - AutoCAD I**

Introduces computer-aided drafting (CAD) using AutoCAD software. Students develop skills in drawing setup and organization, drawing and editing objects, creating complex shapes, dimensioning, using text, display and layer control, using symbols, drawing techniques, and plotting. No previous computer experience is required, but a background in fundamental blueprint reading and/or drafting skills is recommended.

3 Credit hours

36 Lecture hours

36 Lab hours

**607-178 - Revit**

Introduces the student to the concepts and advantages of BIM modeling over CAD drafting. Exercises include designing a project using Mass Modeling, creating custom walls and objects, and creating a set of building construction documents for a 3 story office building. Other exercises include creating site plans with topography, working with phases, and generating sections and details. Deals with sharing files between multiple users and disciplines through a Central File and importing models into Navisworks. Knowledge of computer-aided drafting, construction methods and basic computer skills will be beneficial.

3 Credit hours

36 Lecture hours

36 Lab hours