

Civil Engineering Technology

Program Number: 10-607-1

Associate in Applied Science Degree

Applied Engineering Technologies Program Cluster

Center for Agriscience & Technologies

Program offered at Madison Campuses

For information call: (608) 246-6800 or
(800) 322-6282 Ext. 6800

About the Program

This program trains technicians to assist civil engineers in planning, scheduling, designing, estimating, surveying and inspecting the construction of highways, bridges, buildings and other structures. Specific courses provide a student with the option for a career in land surveying.

Unique Requirements for Admission

High school course recommendations: We strongly recommend that students take the math sequence of Algebra 1 and Algebra 2 to best prepare them for this program. In addition, a high school physical science course is highly recommended. Students must earn a 2.0 (C) or better in the high school courses. Contact the Civil Engineering academic advisor at (608) 246-6232 for pre-registration advising.

The Civil Engineering Program participates in MAAP (Mandatory Assessment, Advising and Placement). This requires new students to complete the COMPASS or ASSET test. Advisement and course placement in English and math is done based on test results. Testing will be required prior to admission.

Curriculum

FIRST YEAR

First Semester		Credits	Hrs/week Lec-Lab
10-103-135	Windows XP OR	1	2.25-.75
10-103-124	Windows Vista	(1)	(2.25-.75)
10-103-137	Word-Beginning	1	2.25-.75
10-607-120	Methods in Civil Engineering	2	2-0
10-607-155	Survey 1	3	2-3
10-801-195	Written Communication	3	3-0
10-804-114	College Technical Math 1B	2	2-0
10-809-197	Contemporary American Society	3	3-0
10-809-199	Psychology of Human Relations	3	3-0
Semester Total		18	

Second Semester

10-103-133	Excel-Beginning	1	2.75-.75
10-607-147	Civil Drawing 1	3	2-3
10-607-149	Aggregates and Concrete	2	1-3
10-607-156	Survey 2	3	2-3
10-607-193	Career Development	1	1-0
10-804-116	College Technical Math 2	4	4-0
10-806-154	General Physics	4	3-1
Semester Total		18	

SECOND YEAR

First Semester

10-607-148	Civil Drawing 2	2	1-3
10-607-158	Survey 3	3	2-3
10-607-160	Soils	2	1-3
10-607-176	Site Hydraulics	2	1-2
10-607-177	Legal Elements of Engineering	2	2-0
10-801-197	Technical Reporting	3	3-0
<u>Elective</u>		<u>3</u>	<u>E</u>
Semester Total		17	

Second Semester

10-607-133	Estimating	3	2-2
10-607-161	Project	3	1-6
10-607-171	Construction Materials	2	2-2
10-607-179	Introduction to GIS	2	1-1
10-809-195	Economics	3	3-0
<u>Elective</u>		<u>3</u>	<u>E</u>
Semester Total		16	

Note: Students are assessed for correct placement in English or mathematics courses based on their scores on the COMPASS test or on completion of the appropriate prerequisite/s. Additionally, there may be courses in other subject areas that may use COMPASS scores as prerequisites when reading, writing, math, or critical thinking competencies are required.

Program Courses

10-607-120 Methods in Civil Engineering 2 credits

An introductory engineering course that familiarizes students with the civil engineering and construction processes from project concept to completion. Provides new students opportunity to develop and improve their problem-solving skills and prepare for subsequent technical courses.

10-607-133 Estimating 3 credits

Stresses estimating for general civil engineering work. Covers the preparation of detailed estimates as prepared by contractors for bidding purposes, the general estimate as prepared by engineers, and approximate estimates. Areas covered: highways, water and sewer lines, bridges, culverts, streets and general construction grading. Prerequisite: 10-607-177, fourth-semester standing or consent of instructor.

10-607-147 Civil Drawing 1 3 credits

Emphasis on development of graphical communication. Begins with basic manual drafting skills including line work, lettering, drafting tools use and free hand sketching of construction details. Transition in the last half of the semester to a CAD-based environment stressing geometric construction principles and simple engineering drawings. Corequisite: 10-607-156 and 10-103-135 or 10-103-124.

10-607-148 Civil Drawing 2 2 credits

Applications-oriented class with CAD emphasis. More complex drawing projects including mapping, roadway design elements and structural detail applications. Drawing organization and standards, data conversion and sharing, third-party add-ins. Prerequisite: 10-607-147 and 10-607-156.

10-607-149 Aggregates and Concrete 2 credits

Introduces the fundamental principles of aggregates, Portland cement concrete and bituminous concrete. Emphasizes standards-based sampling and testing in laboratory and field environments. Tests are performed according to standards set by the American Society for Testing and Materials (ASTM) and American Association of State Highway and Transportation Officials (AASHTO). Students communicate results in written reports. Prerequisite: 10-804-114 and 10-103-137.

10-607-155 Survey 1 3 credits

Basic measurement concepts, procedures, errors and computations underlying the technical aspects of surveying. Students use modern instrumentation to perform elevation, distance, and angular measurements. Coordinate geometry is introduced as a computational tool. Computations are done both manually and on computer using commercial software. Corequisite: 10-804-114, 10-607-120 and 10-103-135 or 10-103-124.

10-607-156 Survey 2 3 credits

Principles, computations and field methods, from design to stakeout, involved in three-dimensional curvilinear survey applications. AASHTO and WisDOT vertical and horizontal alignment standards; geometric and volumetric calculations. Field work reflecting different construction surveys are performed utilizing modern instrumentation. Prerequisite: 10-607-155. Corequisite: 10-607-147 and 10-804-116.

10-607-158 Survey 3 3 credits

Advanced concepts and procedures building on knowledge and skills attained in previous surveying classes. Concepts include geodetic applications, spatial reference systems, equipment adjustment, digital data collection and photogrammetry. Fieldwork includes total station calibration, control leveling, control network establishment and digital topographic data collection. Prerequisite: 10-607-156 and 10-607-147.

10-607-160 Soils 2 credits

Introduces the basic principles of soil mechanics and their application in engineering practice. Topics include soil composition and texture, subsurface investigation, classification, moisture-density relationships, permeability and seepage, consolidation, settlement, shear strength, lateral earth pressures, fundamentals of retaining structures, shallow and deep foundations, slope stability and erosion loss calculations. Prerequisite: 10-806-154 and 10-607-149. Corequisite: 10-801-197.

10-607-161 Project 3 credits

Project-driven course through which civil engineering technicians gain firsthand experience with design by developing plans, specifications and reports for a "real-world" project while working in a team environment. Students present written and oral reports to reinforce technical communication skills. Prerequisite: 10-607-148, 10-607-158 and 10-607-176. Corequisite: 10-607-133.

10-607-171 Construction Materials 2 credits

Introduction to the design, specification and detailing of steel and reinforced concrete in typical civil engineering projects. Emphasis on infrastructural applications. Prerequisite: 10-607-160.

10-607-176 Site Hydraulics 2 credits

Basic concepts of hydraulics and hydrology, water resources, distribution systems and sewerage collection systems as applied to site development. Prerequisite: 10-607-149.

10-607-177 Legal Elements of Engineering 2 credits

Emphasizes contract relationships. The first half of the semester is spent studying the elements of a valid contract along with a study of the court system. The remainder of the semester concentrates on specifications, contracting procedure and the relationship between the three main parties involved in a construction contract: owner, engineer and contractor. Other topics include professional liability, professional ethics, product liability, discharge and remedies for non-completion. Prerequisite: third-semester standing or consent of instructor.

10-607-179 Introduction to GIS 2 credits

Basic terminology and components of geographic information systems. Capturing and organizing spatial data; integrating graphic and tabular information. Using spatial relationships to answer geographic queries. Civil engineering applications of GIS technology. Prerequisite: 10-607-147 or consent of instructor

10-607-193 Career Development 1 credit

Prepares students for work in a professional engineering environment by providing them with a knowledge and understanding of themselves and others. This course also guides students through the etiquette required for success in the job market and assists them in assembling the materials and information necessary for effective job applications and interviews. Prerequisite: 10-801-151 and 10-607-120.

Recommended Elective

10-607-190 Special Problems 1 credit

Note: The following two elective courses allow students to meet educational requirements for land surveyor registration as defined in Chapter A-E 6.04 of the Wisconsin Administrative Code. Students interested in a career in Land Surveying should consider taking these courses:

10-607-168 Land Surveying 1 3 credits
10-607-175 Land Surveying 2 3 credits

Career Potential:

- Construction Inspector
- Survey Technician
- Civil CAD Technician
- Materials Testing Technician

More detailed and updated information on this program may be available at: matcmadison.edu. The college reserves the right to make changes in the regulations and courses announced in this publication without notice.

Madison Area Technical College provides equal opportunity in education and employment.

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