

## Civil Engineering Technology

Gainful Employment	Program Name	Program Type	Area of Study
	Civil Engineering Technology (9410) , AAS ( <a href="https://catalog.lakelandcc.edu/degree-certificate-programs/civt/9410/">https://catalog.lakelandcc.edu/degree-certificate-programs/civt/9410/</a> )	Degree	CIVT
	Construction Management (9413) , AAS ( <a href="https://catalog.lakelandcc.edu/degree-certificate-programs/civt/9413/">https://catalog.lakelandcc.edu/degree-certificate-programs/civt/9413/</a> )	Degree	CIVT
	Construction Management Certificate (4131) ( <a href="https://catalog.lakelandcc.edu/degree-certificate-programs/civt/4131/">https://catalog.lakelandcc.edu/degree-certificate-programs/civt/4131/</a> )	Certificate	CIVT
	Facility Management Certificate (4141) ( <a href="https://catalog.lakelandcc.edu/degree-certificate-programs/civt/4141/">https://catalog.lakelandcc.edu/degree-certificate-programs/civt/4141/</a> )	Certificate	CIVT

### **CIVT 1011 Construction Methods and Materials**

**(CTAG, TAG) 3 Credits**

This first course in the program introduces new students to the field of Architecture, Engineering, and Construction. The course content relates to the construction of residential, commercial, and industrial buildings, highways, and other civil engineering projects. Students will study, in detail, the common construction materials and their engineering properties, manufacture, and installation. They will also learn about issues pertinent to the owner, designer, project manager, and constructor. The laboratory component consists of class demonstrations and off-campus site visits as arranged.

(4 contact hours: 2 lecture, 2 lab)

### **CIVT 1012 Reading Construction Drawings**

**1 Credit**

This course introduces students to construction plans for single family residences, light commercial buildings, roadway plans, and municipal project plans. It provides the basic knowledge and drafting skills needed to interpret and evaluate construction contract drawings and specifications.

(2 contact hours: 0.5 lecture, 1.5 lab)

### **CIVT 1016 Civil Drafting**

**3 Credits**

*Prerequisite: CIVT 1011 or permission of department chair.*

This course introduces the fundamentals of light commercial and civil drafting. Students will develop skills in the use of AutoCAD as a drafting instrument in the drawing of orthographic, section, auxiliary, oblique, and pictorial views. The course emphasizes engineering and construction document organization and will use details from civil industry as it applies to sanitary and bridge projects for drafting exercises. The course also introduces students to computer aided design (CAD) through the use of AutoCAD application software. Topics include the use of units, prototype development, computer drawing tools, dimensioning, and printing options.

(5 contact hours: 2 lecture, 3 lab)

### **CIVT 1019 Architectural Building Codes and Standards**

**2 Credits**

*Prerequisite: CIVT 1012 or permission of department chair.*

Students will investigate the building permit process and define buildings as described in the current state building code. The course emphasizes use groups, construction classifications, exit requirements, and fire resistance requirements. Students will develop graphical representations of proper code assemblies and material specifications for walls, roofs, and floor.

(3 contact hours: 1 lecture, 2 lab)

### **CIVT 1021 Construction Materials Testing**

**2 Credits**

*Prerequisite: CIVT 1011, MATH 1001 or MATH 1080 or higher or MATH 1650; or permission of department chair.*

This course covers the fundamentals of field and laboratory testing of the materials incorporated in the construction of roads, walks, parking areas and building structures. Students will perform laboratory experiments in strict accordance with industry standard specifications and apparatus. The knowledge and skills introduced will help students prepare for certification examinations offered nationally by the American Concrete Institute (ACI).

(4 contact hours: 1 lecture, 3 lab)

### **CIVT 1025 Architectural Design**

**3 Credits**

*Prerequisite: CIVT 1016.*

This course introduces the principles of architectural design and graphic presentation of the single-family residence. Students will evaluate form and function of the American home through basic planning procedures to reveal and reflect the needs and expectations of its occupants. Students will learn techniques used to communicate designs graphically, through a series of practical problems and their realistic representations.

(5 contact hours: 2 lecture, 3 lab)

**CIVT 1028 Mechanical and Electrical Systems****2 Credits***Prerequisite: CIVT 1012 or permission of department chair.*

This course provides a comprehensive overview of the design criteria, operation and installation of the heating, ventilation, and air conditioning (HVAC), plumbing, fire protection, communication, electrical and auxiliary systems in a modern building. Topics include the fundamentals of Mechanical/Electrical systems, space allocation for M/E systems in a modern building, and codes and standards for M/E systems.

(3 contact hours: 1 lecture, 2 lab)

**CIVT 1410 Building Construction I****3 Credits***Prerequisite: CIVT 1011, CIVT 1019, MATH 1001 or MATH 1080 or MATH 1650; or permission of department chair.*

This course offers comprehensive exposure to constructing today's residential buildings. Lab exercises allow students to practice basic skills for site work and building layout, as well as installing footings, slabs, unit masonry, light framing systems, insulation, roofing, and other exterior finishes.

(5 contact hours: 2 lecture, 3 lab)

**CIVT 2016 Scheduling and Building Information Modeling****3 Credits***Prerequisite: CIVT 1011, CIVT 1012, ENGR 1000 or ITIS 1000, MATH 1001 or MATH 1080 or MATH 1650; or permission of department chair.*

This course introduces the types and methods of construction scheduling including the relationship of scheduling as it applies to constructors, designers and owners. Instruction includes the uses and applications of Building Information Modeling (BIM) and its applications to the construction procedure. Students will examine various construction management tasks, phases of a construction project and the fundamental principles required for managing construction projects effectively. Students will also use computer software to enhance problem solving in scheduling.

(5 contact hours: 2 lecture, 3 lab)

**CIVT 2017 Construction Estimating and Scheduling****3 Credits***Prerequisite: CIVT 1011, CIVT 1012, ENGR 1000 or ITIS 1000, MATH 1001 or MATH 1080 or MATH 1650; or permission of department chair.*

This course introduces the types and methods of construction cost estimating and scheduling including the relationship of estimating and scheduling as it applies to constructors, designers and owners. Students will develop a basic knowledge required to make detailed quantity take-offs of labor and material costs for the purpose of bidding residential, commercial, and industrial construction projects. Students will examine various construction management tasks, phases of a construction project and the fundamental principles required for managing construction projects effectively. Students will also use computer software to enhance problem solving in both estimating and scheduling.

(5 contact hours: 2 lecture, 3 lab)

**CIVT 2018 Construction Estimating****3 Credits***Prerequisite: CIVT 1011, CIVT 1012, ENGR 1000 or ITIS 1000, MATH1001 or MATH 1080 or MATH 1650; or permission of department chair.*

This course introduces the types and methods of construction cost estimating to projects for constructors, designers and owners. Students will develop a basic knowledge required to make detailed quantity take-offs of labor and material costs for the purpose of bidding residential, commercial, and industrial construction projects. Students will examine various construction management tasks, phases of a construction project and the fundamental principles required for managing construction projects effectively. Students will also use computer software to enhance problem solving skills in estimating.

(5 contact hours: 2 lecture, 3 lab)

**CIVT 2019 Applied Hydraulics****3 Credits***Prerequisite: MATH 1201 or MATH 1280, PHYS 1200.*

This course introduces the basic principles of hydraulics. Students will apply the fundamental properties of fluids in analyzing hydrostatic and fluid flow problems and evaluate applications in open channels, culverts, pipe networks, and pumped systems. The course emphasizes, through laboratory experiments and computer analyses, the understanding and solution of many practical problems relevant to civil engineering projects.

(5 contact hours: 2 lecture, 3 lab)

**CIVT 2020 Green Building and LEED (R) Rating System****3 Credits**

This course offers a comprehensive exposure to understanding sustainable designed projects in today's residential and commercial buildings. It provides the basic knowledge to define and measure "green buildings" according to the LEED® Green Building Rating System™. This course will also help students prepare for the LEED® Professional Accreditation Exams. contact

(3 contact hours)

**CIVT 2024 Construction Administration and Inspection****3 Credits**

The course emphasizes basic principles of construction administration and inspection from the design process through the construction process, including discussion of the Construction Team Responsibility and Authority. Topics include the Resident Inspector's responsibilities and all aspects of records, reporting, applicable codes and standards, inspection methods and procedures and contract administration. Additional topics include construction law and labor relations, building codes, quality assurance and quality control, construction safety, meetings and negotiations, risk allocation and liability sharing.

(4 contact hours: 2 lecture, 2 lab)

**CIVT 2025 Safety in Construction****2 Credits**

This course emphasizes the basic principles of construction safety and health from the rationale for the programs through the management of safety and health programs. Topics include the significance of safety and health issues on a construction project, construction safety and health legislation and organizations, the principles of accident investigation and analysis and injury control fundamentals, construction industry safety and health practices and applicable OSHA standards, engineering, design and contract administration for safe construction, and construction safety and health management. Students will be awarded an OSHA 30 hour certificate upon completion of this course.  
(3 contact hours: 1 lecture, 2 lab)

**CIVT 2026 Soil and Foundations****(TAG) 3 Credits***Prerequisite: CIVT 1021, MECT 2230.*

This course specializes in general approaches to the study of soils and foundations, including problem solving. Topics include the mathematical basis of soil mechanics; geologic formations, excavation techniques, and methods of subsurface exploration; natural deposits and non-uniform soils; and shallow and deep foundation analysis and design. .  
(5 contact hours: 2 lecture, 3 lab)

**CIVT 2027 Concrete and Masonry Construction****3 Credits***Prerequisite: MECT 2230.*

This course introduces students to the basic design of concrete and masonry construction using the latest versions of American Concrete Institute (ACI) and American Society of Civil Engineers (ASCE) Publications. The laboratory component consists of student led problem solving and the use of computer software applications in designing structural systems.  
(5 contact hours: 2 lecture, 3 lab)

**CIVT 2028 Steel and Timber Construction****3 Credits***Prerequisite: MECT 2230.*

This course introduces students to the basic design principles of steel and timber construction using the latest versions of American Institute of Steel Construction (AISC) and American Institute of Timber Construction (AITC) Publications. The laboratory component consists of student led problem solving and the use of computer software applications in designing structural systems.  
(5 contact hours: 2 lecture, 3 lab)

**CIVT 2029 Environmental Technology****3 Credits***Prerequisite: CIVT 2019.*

This course introduces the basics of environmental engineering technology, including air pollution controls, solid and hazardous waste management, municipal water and wastewater treatment, and wetlands delineation. It identifies facets of the environment that affect the ecosystem and human life and explores those technical issues relevant to the implementation of environmental management efforts.  
(5 contact hours: 2 lecture, 3 lab)

**CIVT 2030 Introduction to GPS Satellite Surveying****2 Credits***Prerequisite: CIVT 2112 or permission of department chair.*

This course is designed to present an introduction to basic GPS surveying principles and techniques that are used by land surveyors to meet the challenge of establishing and acquiring accurate and repeatable GPS measurements.  
(2.5 contact hours: 1.5 lecture, 1 lab)

**CIVT 2111 Surveying I****2 Credits***Prerequisite: CIVT 1016, MATH 1001 or MATH 1180 or MATH 1650, MECT 1150; or permission of department chair.*

This course is designed to give students hands-on experience in the use of surveying equipment with emphasis on surveying methodology. Students will use the following equipment: surveyor's tape, the theodolite, the automatic level, and their respective peripherals.  
(4 contact hours: 1 lecture, 3 lab)

**CIVT 2112 Surveying II****2 Credits***Prerequisite: CIVT 2111.*

This course continues to provide students with hands-on experience in the use of surveying equipment and surveying methodology. It emphasizes the following practical surveying applications: tape-transit traverse, staking boundary corners, transit-stadia-EDMI traverse, and topographic surveys.  
(4 contact hours: 1 lecture, 3 lab)

**CIVT 2400 Structures in Construction I****3 Credits***Prerequisite: MATH 1180 or MATH 1101 or MATH 1700, PHYS 1100 or PHYS 1610; or permission of department chair.*

This course emphasizes the systematic application of equilibrium principles, commonly called statics, to parts and structures, including analysis of external forces as vectors, multi-force members, two-dimensional trusses, and properties of cross-sectional geometry. Students will study internal forces, with associated material limits, of structures necessary to maintain equilibrium. They will also study effects of direct and shear loads in relation to material strength and deformation for simple structures and beams.  
(5 contact hours: 2 lecture, 3 lab)

**CIVT 2405 Structures in Construction II****3 Credits**

*Prerequisite: CIVT 2400 or permission of department chair.*

This course offers the students an introduction to the design of elements for light commercial and residential buildings. The topics include the fundamentals of design and detailing. Materials of construction include timber, light framing, composites, masonry, concrete, light gauge steel, and structural steel.

(5 contact hours: 2 lecture, 3 lab)

**CIVT 2420 Building Construction II****3 Credits**

*Prerequisite: CIVT 1410 or permission of department chair.*

This course is a continuation of CIVT 1410 Building Construction I and offers a comprehensive presentation of today's light commercial construction systems. Instruction includes plumbing and electrical systems, heating and cooling systems, metal studs, anchoring systems, steel erection, plumbing and wiring, mechanical equipment installation and exterior finishes. Lab exercises allow students to develop skills in light commercial construction practices.

(5 contact hours: 2 lecture, 3 lab)