Land Surveying Bachelor's Degree (LS.BAS)

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The Bachelor of Applied Science degree in Land Surveying prepares students for work as professional surveyors, and meets the educational requirements for surveyors.

Graduates also are prepared to take NCEES exams (National Council of Examiners for Engineering and Surveying) that are required to obtain professional licensure in land surveying.

Bachelor's degree coursework includes fundamental principles of civil engineering, construction, and site design, as well as skills required to operate state-of-the-art surveying equipment and computer software.

In addition, students gain knowledge of boundary resolution, subdivision design, geographic information systems (GIS), and global positioning systems (GPS).

Students participate in experiential learning through cooperative education in each year of the bachelor's degree program.

A surveyor enjoys diverse job responsibilities. Many surveyors work outside for surveying firms collecting data, establishing control points, and determining boundary locations. Others work inside at a surveying firm, a civil engineering office, or in an architecture firm, helping with site design activities and developing plans while using the field data.

Surveyors may work on their own or with firms specializing in construction, architecture, or engineering. Surveyors also work in private industry or work for the public with responsibilities including planning and zoning, transportation, land development, forensics, boundary control, geomatics, or law.

Graduates of the bachelor's degree program have the knowledge and skills needed to establish their own company or work for a larger firm as a land surveying technician, professional land surveyor, or survey director.

For more information, please contact the Engineering and Information Technologies Division at (513) 569-1743.

To apply for this program at Cincinnati State, visit the Admissions (http://www.cincinnatistate.edu/academics/admission/) section of the College website.

Land Surveying (LS)

First Year				
Semester 1		**Lec**	**Lab**	**Credits**
FYE 1XX		1	0	1
First Year Experience Elective (**B**)				
MAT 151	College Algebra	4	0	4
SUR 100	Introduction to Land Surveying	2	2	3
CET 115	Architectural Drafting and Computer Aided Design	2	4	4
CET 105	Introduction to Surveying	2	3	3
Semester 2				
MAT 152	Trigonometry	4	0	4
SUR 120	Computer Aided Design, Civil 3D, and Surveying Software	2	4	4
CET 110	Advanced Surveying and Construction Layout	2	3	3
CET 266	Surveying History in Ohio, Kentucky, and Indiana	4	0	4
Semester 3				
ENG 101	English Composition 1	3	0	3
CET 291	Full-Time Cooperative Education 1: Civil Engineering Technology	1	40	2
Second Year				
Semester 1				
PHY 151	Physics 1: Algebra and Trigonometry-Based	3	2	4
SUR 221	Dendrology 1	1	1	2
CET 250	Route Location and Design	3	2	4
CET 251	Elements of Land Surveying 1	3	2	4
CET 255	Land Information Modeling	2	3	3
Semester 2				
ENG 10X	English Composition Elective	3	0	3
ECO 110	Principles of Macroeconomics	3	0	3
COMM 110	Public Speaking	3	0	3
SUR 222	Dendrology 2	0	2	1
CET 252	Elements of Land Surveying 2	3	3	4
Semester 3				
CET 292	Full-Time Cooperative Education 2: Civil Engineering Technology	1	40	2
CET 260	Control Surveying	3	3	4
Third Year				
Semester 1				
XXX XXX	Social/ Behavioral Science Elective	3	0	3
XXX XXX	Arts/ Humanities Elective 1	3	0	3
MAT XXX	Mathematics Elective	2	2	3
CET 277	Survey Calculations and Statistics	4	0	4
Semester 2				
PHY 152	Physics 2: Algebra and Trigonometry-Based	3	2	4

XXX XXX Arts/ Humanities Elective 2		3	0	3
CET 267	Surveying Laws and Ethics	4	0	4
CET 287	Geospatial Surveying	4	0	4
Semester 3				
SUR 491	Full-Time Cooperative Education 3: Land Surveying	1	40	2
Fourth Year				
Semester 1				
SUR 420	Photogrammetry and Remote Sensing	2	3	3
EVS 120	Environmental Geology	3	2	4
MKT 101	Principles of Marketing	3	0	3
MGT 120	Entrepreneurship	3	0	3
Semester 2				
XXX XXX Science Elective		3	2	4
CET 265	Subdivision Design and Drainage Control	3	3	4
CET 290	Civil Engineering Technology Surveying Capstone	1	6	3
Total Credits:		100	174	126

Electives

First Year Experience Elective		
FYE 100	College Survival Skills	1
FYE 105	College Success Strategies	2
FYE 110	Community College Experience	3
English Composition Elective		
ENG 102	English Composition 2: Contemporary Issues	3
ENG 104	English Composition 2: Technical Communication	3
ENG 105	English Composition 2: Business Communication	3
Mathematics Elective		
MAT 131	Statistics 1	3
MAT 251	Calculus 1	5
Social/Behavioral Science Elective (select 1 course)		
ECO 105	Principles of Microeconomics	3
GEO 105	World Regional Geography: the Americas, Europe, and Australia	3
GEO 110	World Regional Geography: Asia, Africa, and the Middle East	3
GEO 115	Cultural Geography	3
HST 101	World History: First Civilizations to 1500	3
HST 102	World History: 1500 to Present	3
HST 111	American History: Early Settlers to 1877	3
HST 112	American History: 1877 to Present	3
HST 121	African American History: Origins to 1877	3
HST 122	African American History: 1877 to Present	3
HST 130	History of Africa	3
LBR 105	Introduction to Labor and Employee Relations	3
POL 101	Introduction to American Government	3
POL 102	Introduction to Comparative Governments and Politics	3
PSY 110	Introduction to Psychology	3
PSY 200	Abnormal Psychology	3
PSY 205	Child Development	3
PSY 210	Adolescent Development	3
PSY 215	Adult Development	3
PSY 220	Social Psychology	3
PSY 225	Lifespan Development	3
SOC 105	Introduction to Sociology	3
SOC 115	Marriage and the Family	3
SOC 130	Sociology of Aging	3
SOC 140	Sociology of Gender	3
Arts/Humanities Electives (select 2 courses)		
ART 110	Introduction to Art	3
ART 111	Art History: Ancient to Medieval Periods	3
ART 112	Art History: Renaissance to the Present	3
COMM 130	Introduction to Film Studies	3
LIT 200	Introduction to Literature	3
LIT 210	The Short Story	3
LIT 220	Poetry	3
LIT 230	Drama	3
LIT 240	The Novel	3
LIT 251	American Literature to 1865	3
LIT 252	American Literature since 1865	3
LIT 255	African American Literature	3
LIT 261	British Literature: Medieval Period to 1800	3
LIT 262	British Literature: 1800 to Present	3
LIT 265	Shakespeare	3
LIT 270	Children's Literature	3
LIT 280	Science Fiction	3
LIT 285	Women Writers	3
MUS 101	Music History: Middle Ages to Late 19th Century	3
MUS 102	Music History: 20th Century	3
MUS 105	Music History: African-American Music	3
MUS 110	Jazz Appreciation	3
MUS 115	Rock and Pop Music	3
MUS 120	World Music	3
PHI 105	Introduction to Philosophy	3
PHI 110	Ethics	3
REL 105	World Religions	3
THE 105	Theater Appreciation	3
THE 110	History of Theater	3
Science Elective		
BIO 131	Biology 1	5
CHE 121 & CHE 131	General Chemistry 1 and General Chemistry 1 Lab	5
PSC 105	Astronomy	4

Some courses are offered in alternative versions identified with a letter after the course number-- for example, ENG 101 and ENG 101A.

- This curriculum displays only course numbers without the added letter.
- The alternative version, when available, meets the requirements of the course version without the added letter.

Land Surveying Bachelor's Degree (LS.BAS)

An ability to identify, formulate, and solve broadly defined technical or scientific problems by applying knowledge of mathematics and science and/or technical topics to areas relevant to the discipline.

An ability to formulate or design a system, process, procedure, or program to meet desired needs.

An ability to develop and conduct experiments or test hypotheses; analyze and interpret data; and use scientific judgment to draw conclusions.

An ability to communicate effectively with a range of audiences.

An ability to understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts.

An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty.

Faculty

Program Chair

Carol Morman, PE, PS, MS
carol.morman@cincinnatistate.edu

Co-op Coordinator

Doug Woodruff, MBA
doug.woodruff@cincinnatistate.edu

CET Courses

CET 100 Introduction to Civil Engineering Technology
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on foundation concepts in civil engineering technology. Topics include: CET program and curriculum, career preparation, licensing, ethics, diversity, and OSHA. Students use Microsoft Word, Excel, and Powerpoint to complete assignments.
Prerequisites: None

CET 105 Introduction to Surveying
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on foundation concepts of land surveying and site planning. Topics include: angle, distance, and elevation measurement; contours; and mapping and site planning fundamentals. Students complete outdoor field exercises and manual drafting lab exercises.
Prerequisites: MAT 121 or appropriate placement
Ohio Transfer Assurance Guide Approved

CET 107 Construction Health and Safety
4 Credits. 4 Lecture Hours. 0 Lab Hour.
An introduction to construction safety. Topics include: risk management, safety hazards, the Code of Federal Regulations, and OSHA Construction Industry Standards outlined in Federal Code 29 CFR Part 1926. Students who complete the course successfully earn the OSHA 30-hour certificate.
Prerequisites: None

CET 110 Advanced Surveying and Construction Layout
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course in land surveying and construction layout. Topics include: traverse calculations, coordinate geometry, and field construction layout with methods of providing line and grade for varied projects. Students complete outdoor field exercises and computer lab exercises.
Prerequisites: CET 105

CET 115 Architectural Drafting and Computer Aided Design
4 Credits. 2 Lecture Hours. 4 Lab Hours.
A course on applying architectural drafting techniques and computer aided design concepts. Topics include: building codes, building materials, and fundamentals of CAD software. Students prepare residential working drawings.
Prerequisites: None

CET 117 Construction Risk Management and Insurance
4 Credits. 4 Lecture Hours. 0 Lab Hour.
A course on insurance for the construction management process. Topics include: financial risk planning, risk management, insurance markets, property insurance, contractual risks and transfer, forms of liability insurance (commercial, employers, environmental, management, and professional), and workers' compensation.
Prerequisites: None

CET 120 Advanced Computer Aided Design: Revit Architecture
4 Credits. 3 Lecture Hours. 3 Lab Hours.
A course on CAD techniques that apply building information modeling using Revit Architecture. Topics include: layouts, dimensioning, blocks, and hatching.
Prerequisites: CET 115

CET 125 Statics and Strength of Materials (CET)
4 Credits. 3 Lecture Hours. 3 Lab Hours.
A course on applying physical principles to solve problems of equilibrium and behavior in civil engineering structures. Topics include: force resultants, equilibrium, truss analysis, direct stress, bending stress, beam behavior, and combined stress.
Prerequisites: MAT 124 or appropriate placement

CET 127 Environmental and Legal Issues in Construction
4 Credits. 4 Lecture Hours. 0 Lab Hour.
A course on environmental and legal issues affecting construction safety. Topics include: stormwater pollution prevention plans, asbestos abatement, disturbance and abatement of lead-containing materials, silica exposure, EPA regulations, multi-employer worksite rules, intentional torts, safety violations, and union contracts.
Prerequisites: None

CET 130 Building Codes and Materials
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on building code requirements and their applications to designing and constructing building projects. Topics include: Ohio building, mechanical, electrical, and plumbing codes; and building materials used in construction such as steel, wood, masonry, and concrete.
Prerequisites: CET 115

CET 133 Home Inspection - American Society of Ho me Inspectors
5 Credits. 2 Lecture Hours. 6 Lab Hours.
A course that meets requirements for the American Society of Home Inspectors (ASHI)120-hour home inspection course. Topics include: standards and reports, exterior cladding, exterior structures, roofing and foundations, interiors, electrical systems, heating, air conditioning, and plumbing. Students participate in field inspection lab activity and take a certification exam. A comprehensive final score of 70% is required to pass the course.
Prerequisites: None

CET 135 Construction Estimating
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on quantifying various components of a commercial project using a complete set of working drawings and specifications. Topics include: blueprint reading, specification analysis, construction methods and materials, and proper estimating communication practices.
Prerequisites: MAT 124 or appropriate placement

CET 137 Construction Safety Plan Management
3 Credits. 3 Lecture Hours. 0 Lab Hour.
A course on developing construction safety plans. Topics include: essential elements of a safety program; best practices, legal, and regulatory requirements related to safety planning; substance abuse programs; accident investigations; contractor management; and crisis management and planning.
Prerequisites: None

CET 147 Safety Training Workshops
1 Credit. 1 Lecture Hour. 0 Lab Hour.
Students participate in construction training workshops that provide fundamental instruction in safety methods and practices. Workshops must be approved by the program chair.
Prerequisites: Program Chair consent

CET 150 Building Technology Studies: Advanced Standing
1-30 Credits. 0 Lecture Hour. 0 Lab Hour.
Students complete courses or programs that develop expertise in skills related to the building trades.
Prerequisites: Program Chair consent
Instructor Consent Required

CET 191 Part-Time Cooperative Education 1: Civil Engineering Technology
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their first part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: None

CET 192 Part-Time Cooperative Education 2: Civil Engineering Technology
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their second part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CET 191

CET 193 Part-Time Cooperative Education 3: Civil Engineering Technology
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their third part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CET 192

CET 194 Part-Time Cooperative Education 4: Civil Engineering Technology
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their fourth part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CET 193

CET 195 Part-Time Cooperative Education 5: Civil Engineering Technology
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their fifth part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CET 194

CET 196 Part-Time Cooperative Education 6: Civil Engineering Technology
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking an associate's degree participate in their sixth part-time field learning experience related to their degree. Students are expected to register for academic courses during the same semester. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CET 195

CET 200 Structural Design
4 Credits. 3 Lecture Hours. 3 Lab Hours.
A course on methods for evaluation and design of structural steel and reinforced concrete members, using AISC and ACI requirements. Topics include: design methodologies focused on bending moment behavior, tension and compression behavior, shear behavior, and connections; and common field testing techniques for concrete.
Prerequisites: CET 125

CET 205 Architectural Design and 3D Modeling: Revit Architecture
4 Credits. 3 Lecture Hours. 3 Lab Hours.
A course on architectural details and information required in a complete set of professional working drawings for an office or commercial building. Topics include: using CAD design software and Revit Architecture.
Prerequisites: CET 120
Corequisites: CET 211, CET 212

CET 210 Lighting and Electrical Systems Design
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on fundamental concepts for lighting and electrical design in commercial buildings. Topics include: creating sets of drawings in AutoCAD and Revit Architecture, and using the National Electric Code.
Prerequisites: CET 120

CET 211 Advanced Revit: Mechanical
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on understanding concepts of plumbing and mechanical systems and preparing details of plumbing and mechanical systems layouts using Revit software.
Prerequisites: CET 120
Corequisites: CET 205, CET 212

CET 212 Advanced Revit: Electrical
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on understanding concepts of electrical power and lighting systems and and preparing details of electrical power and lighting systems layouts using Revit software.
Prerequisites: CET 120
Corequisites: CET 205, CET 211

CET 215 Mechanical and HVAC Systems Design
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on fundamental concepts of mechanical and HVAC design for commercial buildings. Topics include: creating sets of design drawings using AutoCAD and Revit, and Ohio mechanical and plumbing codes.
Prerequisites: CET 120

CET 220 3D Modeling: Revit MEP and Revit Structure
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on applying design concepts and preparing details of mechanical and electrical systems, plumbing, and structure in buildings using Revit MEP and Revit Structure software.
Prerequisites: CET 205

CET 225 Building Construction
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on how buildings and structures are assembled. Topics include: methods and materials for residential, commercial, industrial, and highway construction including wood frame, masonry, pre-engineered metal, tilt-up, and high-rise construction; building codes; zoning regulations; and footing design.
Prerequisites: None
Ohio Transfer Assurance Guide Approved

Ohio Career-Technical Assurance Guide Approved

CET 230 Construction Management
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course that examines current concerns in construction management. Topics include: project delivery systems, contract types, and using Web-based software for daily project management.
Prerequisites: CET 135

CET 235 Construction Scheduling
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on preparing precedence diagram CPM schedules and calculating the critical path, including start-to-start and finish-to-finish relationship types with lag. Topics include: using scheduling software, fast-tracking, reverse phase scheduling, and revising and updating schedules.
Prerequisites: CET 135

CET 240 Cost Engineering
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on how budgets evolve as projects move from pre-design through construction. Topics include: types of estimates employed at each phase, formulating unit prices, time value of money and true profit, cash flow, cost indices, and using estimating software.
Prerequisites: CET 135

CET 245 Building Information Models for Construction
2 Credits. 1 Lecture Hour. 3 Lab Hours.
A course on using building modeling software for construction management tasks such as estimating, trade coordination, and scheduling. Topics include: parameter creation, quantity takeoff, estimation, interference checking, and timeline visualization.
Prerequisites: CET 120

CET 250 Route Location and Design
4 Credits. 3 Lecture Hours. 2 Lab Hours.
A course on highway design criteria and standards. Topics include: design and layout of horizontal curves, verticals, and spirals; superelevation use; typical sections; and boundary, area, and right-of-way determination. Students complete outdoor field exercises and computer lab exercises.
Prerequisites: CET 110

CET 251 Elements of Land Surveying 1
4 Credits. 3 Lecture Hours. 2 Lab Hours.
A course on fundamental concepts and techniques of land boundary surveying. Topics include: records research, state minimum standards, monumentation of corners, and simple plats and legal descriptions. Students must complete field exercises.
Prerequisites: CET 110

CET 252 Elements of Land Surveying 2
4 Credits. 3 Lecture Hours. 3 Lab Hours.
A continuation of CET 251. Topics include: sequential and simultaneous boundaries, riparian and littoral boundaries, public land surveys, easements, and legal principles of property relating to surveyors.
Prerequisites: CET 251

CET 255 Land Information Modeling
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on concepts and techniques of land modeling. Topics include: mapping, using geographic information system software, advanced digital terrain modeling, 3D laser scanning, LIDAR, high-definition surveying, and 3D site modeling for visualization and machine-control projects.
Prerequisites: CET 110

CET 260 Control Surveying
4 Credits. 3 Lecture Hours. 3 Lab Hours.
A course in concepts and techniques of control surveying. Topics include: basic geodesy, state plane coordinate concepts and calculations, establishing horizontal and vertical control, GPS positioning, and network adjustment. Students complete outdoor field exercises and computer lab exercises.
Prerequisites: CET 110

CET 265 Subdivision Design and Drainage Control
4 Credits. 3 Lecture Hours. 3 Lab Hours.
A course on applying land surveying and civil engineering design principles to land development projects. Topics include: subdivision regulations, zoning regulations, lot layout, street layout, utility design, drainage, and site grading. Students create a set of subdivision drawings to meet local standards.
Prerequisites: CET 255

CET 266 Surveying History in Ohio, Kentucky, and Indiana
4 Credits. 4 Lecture Hours. 0 Lab Hour.
A course on the history of surveying in Ohio, Indiana, and Kentucky, including the original surveys in these states.
Prerequisites: Admitted to the Advanced Surveying Certificate (ASC) or Land Surveying Certificate (LSC), or Program Chair approval

CET 267 Surveying Laws and Ethics
4 Credits. 4 Lecture Hours. 0 Lab Hour.
A course on surveying law and professional ethics in Ohio, Indiana, and Kentucky, including legislation and regulations affecting land surveyors in these states.
Prerequisites: Admitted to the Advanced Surveying Certificate (ASC) or Land Surveying Certificate (LSC), or Program Chair approval

CET 270 OSHA 30 for Construction
2 Credits. 2 Lecture Hours. 0 Lab Hour.
A course for workers and employers on the recognition, avoidance, abatement, and prevention of safety and health hazards in workplaces in the construction industry. Topics include: workers' rights, employer responsibilities, how to file a complaint, and other information required to receive OSHA 30 certification by the U.S. Department of Labor's Occupational Safety and Health Administration.
Prerequisites: None

CET 277 Survey Calculations and Statistics
4 Credits. 4 Lecture Hours. 0 Lab Hour.
A course on survey calculations employing statistical concepts. Topics include: descriptive and inferential statistics, advanced coordinate geometry methods, least squares adjustment, and error theory.
Prerequisites: Admitted to the Advanced Surveying Certificate (ASC) or Land Surveying Certificate (LSC), or Program Chair approval

CET 280 Civil Engineering Technology Architectural Capstone
4 Credits. 2 Lecture Hours. 6 Lab Hours.
Students design a one-story commercial building with complete, integrated building systems for architectural, mechanical, and electrical systems; apply multiple appropriate codes; and create sets of drawings using AutoCAD and Revit software as appropriate.
Prerequisites: CET 205 and CET 210 and CET 215

CET 285 Civil Engineering Technology Construction Management Capstone
3 Credits. 2 Lecture Hours. 3 Lab Hours.
Students respond to a request for construction management services and complete a project that demonstrates integrated competencies in estimating, scheduling, communicating, and teamwork.
Prerequisites: CET 230 and CET 235

CET 287 Geospatial Surveying
4 Credits. 4 Lecture Hours. 0 Lab Hour.
A course on surveying using geospatial methods. Topics include: satellite positioning, geographic information systems, remote sensing, and laser scanning.
Prerequisites: Admitted to the Advanced Surveying Certificate (ASC) or Land Surveying Certificate (LSC), or Program Chair approval

CET 290 Civil Engineering Technology Surveying Capstone
3 Credits. 1 Lecture Hour. 6 Lab Hours.
Students complete a project that demonstrates integrated competencies in surveying and mapping, including data collection, field work, computer laboratory work, and use of conventional and GPS equipment.
Prerequisites: CET 251

CET 291 Full-Time Cooperative Education 1: Civil Engineering Technology
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their first full-time field learning experience related to their degree. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: None

CET 292 Full-Time Cooperative Education 2: Civil Engineering Technology
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their second full-time field learning experience related to their degree. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CET 291

CET 293 Full-Time Cooperative Education 3: Civil Engineering Technology
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their third full-time field learning experience related to their degree. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CET 292

CET 294 Internship 1: Civil Engineering Technology
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their first unpaid field learning experience related to their degree. Students must follow applicable policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CET 100

CET 295 Internship 2: Civil Engineering Technology
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's degree participate in their second unpaid field learning experience related to their degree. Students must follow applicable policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: CET 294

SUR Courses

SUR 100 Introduction to Land Surveying
3 Credits. 2 Lecture Hours. 2 Lab Hours.
A course on foundational concepts in land surveying. Topics include: Land Surveying program expectations and curriculum, career preparation, licensing, ethics, diversity, and OSHA regulations. Students use Microsoft Word, Excel, and PowerPoint to complete assignments.
Prerequisites: None

SUR 120 Computer Aided Design, Civil 3D, and Surveying Software
4 Credits. 2 Lecture Hours. 4 Lab Hours.
A course on applying advanced concepts of computer aided design, using Civil 3D and other surveying software.
Prerequisites: CET 115

SUR 221 Dendrology 1
1 Credit. 0 Lecture Hour. 2 Lab Hours.
A 7-week course on identification of commonly-encountered woody plants of southwestern Ohio, southeastern Indiana, and northern Kentucky, emphasizing use of botanical keys for identification during the summer season. Topics include: identifying markings and evidence of tree remnants to identify property corners and witness corners for land surveying.
Prerequisites: None

SUR 222 Dendrology 2
1 Credit. 0 Lecture Hour. 2 Lab Hours.
A 7-week course that is a continuation of SUR 221, emphasizing use of botanical keys for identification during the winter season while identifying commonly-encountered woody plants of southwestern Ohio, southeastern Indiana, and northern Kentucky.
Prerequisites: SUR 221

SUR 391 Part-Time Cooperative Education 1: Land Surveying
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking a bachelor's degree participate in their first full-time field learning experience related to their degree. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: None

SUR 420 Photogrammetry and Remote Sensing
3 Credits. 2 Lecture Hours. 3 Lab Hours.
A course on concepts and techniques for photogrammetry and remote sensing. Topics include: laser scanning, data storage and usage, data sharing, unmanned aerial vehicles, and other current advanced surveying technologies.
Prerequisites: CET 277 and CET 287

SUR 465 Subdivision Design and Drainage Control
4 Credits. 3 Lecture Hours. 3 Lab Hours.
A course on concepts and techniques for subdivision design and drainage control, emphasizing large land developments and site design.
Prerequisites: SUR 120 and CET 250

SUR 490 Land Surveying Capstone
3 Credits. 1 Lecture Hour. 6 Lab Hours.
Students complete a field project that demonstrates integrated competencies in advanced surveying concepts and techniques, and review topics included in the National Council of Examiners for Engineering and Surveying (NCEES) Fundamentals of Surveying exam.
Prerequisites: CET 250 and CET 252 and CET 267

SUR 491 Full-Time Cooperative Education 3: Land Surveying
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking a bachelor's degree participate in their third full-time field learning experience related to their degree. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: None

SUR 492 Full-Time Cooperative Education 4: Land Surveying
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking a bachelor's degree participate in their fourth full-time field learning experience related to their degree. Students must follow cooperative education policies and procedures to earn credit. Grades issued are Satisfactory or Unsatisfactory.
Prerequisites: None