Land Surveying Technology (LST)

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A surveyor enjoys diverse responsibilities as part of his or her everyday routine. Many surveying technicians work outside collecting data, establishing control points, and determining boundary locations. Others work inside an engineering office helping with site design activities and developing plans while using the field data.

Graduates of the Land Surveying Technology program earn an Associate of Applied Science degree. Coursework includes operating state-of-the-art surveying equipment and computer software, in conjunction with understanding the fundamentals of civil engineering and site design. Students also gain specialized knowledge of boundary resolution, survey history, geographic information systems (GIS), and global positioning systems (GPS).

Graduates of the Land Surveying Technology program are prepared to take the National Society of Professional Surveyors Certified Survey Technician (NSPS CST) Level II exam and enter the workforce as a surveying technician.

Graduates also may continue their education in Cincinnati State's Bachelor of Applied Science in Land Surveying.

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 Technology (LST)

First Year				
Semester 1		**Lec**	**Lab**	**Credits**
FYE 1XX First Year Experience Elective (**B**)		1	0	1
MAT 151	College Algebra (**G**)	4	0	4
SUR 100	Introduction to Land Surveying (**B**)	2	2	3
SUR 105	Surveying Fundamentals (**B**)	2	3	3
CET 115	Architectural Drafting and Computer Aided Design (**B**)	2	4	4
Semester 2				
MAT 152	Trigonometry (**B**)	4	0	4
SUR 110	Surveying for Construction Layout (**T**)	2	3	3
SUR 120	Computer Aided Design, Civil 3D, and Surveying Software (**T**)	2	4	4
SUR 130	Surveying History (**T**)	4	0	4
Semester 3				
SUR 291	Full-Time Cooperative Education 1: Land Surveying (**T**)	1	40	2
ENG 101	English Composition 1 (**G**)	3	0	3
Semester 4				
PHY 151	Physics 1: Algebra and Trigonometry-Based (**G**)	3	3	4
SUR 200	Route Location and Design (**T**)	3	2	4
SUR 201	Elements of Boundary Surveying 1 (**T**)	2	3	4
SUR 215	Land Information Modeling (**T**)	2	3	3
SUR 221	Dendrology 1 (**T**)	2	0	2
Semester 5				
ENG 10X English Composition Elective (**G**)		3	0	3
ECO 110	Principles of Macroeconomics (**G**)	3	0	3
COMM 110	Public Speaking (**B**)	3	0	3
SUR 222	Dendrology 2 (**T**)	0	2	1
SUR 202	Elements of Boundary Surveying 2 (**T**)	3	3	4
Semester 6				
SUR 230	Control Surveying (**T**)	3	3	4
SUR 292	Full-Time Cooperative Education 2: Land Surveying (**T**)	1	40	2
Total Credits:		**55**	**115**	**72**

Electives

First Year Experience Elective		
FYE 100	College Success Strategies: Overview	1
FYE 105	College Success Strategies: Overview and Application	2
FYE 110	College Success Strategies: Practice and Application	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

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.

The letters G, B, and T (displayed after course titles or elective descriptions) identify types of courses required by the Ohio Department of Higher Education as part of an associate's degree curriculum.

G = General Education course in this curriculum

B = Basic Skills course in this curriculum

T = Technical course in this curriculum

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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 conduct experiments or test theories, as well as to analyze and interpret data.

An ability to function on teams.

An understanding of professional and ethical responsibility.

An ability to communicate effectively.

Faculty

Program Chair

Carol Morman, EdD, PE, PS
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Co-op Coordinators

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Advisors

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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, first aid, and OSHA regulations. Students use Microsoft Word, Excel, and PowerPoint to complete assignments.
Prerequisites: None

SUR 105 Surveying Fundamentals
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 124 or MAT 096 or appropriate placement

SUR 110 Surveying for 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: SUR 105

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. Students complete outdoor field and computer lab exercises and take the National Society of Professional Surveyors (NSPS) CST Level I exam.
Prerequisites: CET 115

SUR 130 Surveying History
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: ENG 080 or appropriate placement

SUR 191 Part-Time Cooperative Education 1: Land Surveying
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking a bachelor's degree participate in a 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 100 or SUR 100

SUR 192 Part-Time Cooperative Education 2: Land Surveying
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking a bachelor's degree participate in a 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: SUR 191

SUR 193 Part-Time Cooperative Education 3: Land Surveying
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking a bachelor's degree participate in a 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: SUR 192 or SUR 291

SUR 194 Part-Time Cooperative Education 4: Land Surveying
1 Credit. 1 Lecture Hour. 20 Lab Hours.
Students seeking a bachelor's degree participate in a 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: SUR 193

SUR 200 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: SUR 110

SUR 201 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: SUR 110

SUR 202 Elements of Land Surveying 2
4 Credits. 3 Lecture Hours. 3 Lab Hours.
A continuation of SUR 201. Topics include: sequential and simultaneous boundaries, riparian and littoral boundaries, public land surveys, easements, and legal principles of property relating to surveyors.
Prerequisites: SUR 201

SUR 215 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: SUR 110

SUR 221 Dendrology 1
2 Credits. 2 Lecture Hours. 0 Lab Hour.
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 230 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 and computer lab exercises and take the National Society of Professional Surveyors (NSPS) CST Level II exam.
Prerequisites: SUR 200

SUR 291 Full-Time Cooperative Education 1: Land Surveying
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's or bachelor's degree participate in a 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: SUR 100 or CET 100

SUR 292 Full-Time Cooperative Education 2: Land Surveying
2 Credits. 1 Lecture Hour. 40 Lab Hours.
Students seeking an associate's or bachelor's degree participate in a 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: SUR 291

SUR 300 Advanced Surveying 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: SUR 200

SUR 305 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: SUR 230

SUR 310 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: SUR 202

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 a 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: SUR 194 or SUR 292

SUR 392 Part-Time Cooperative Education 2: Land Surveying
1 Credit. 0 Lecture Hour. 20 Lab Hours.
Students seeking a bachelor's degree participate in a 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: SUR 391

SUR 393 Part-Time Cooperative Education 3: Land Surveying
1 Credit. 0 Lecture Hour. 20 Lab Hours.
Students seeking a bachelor's degree participate in a 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: SUR 392

SUR 394 Part-Time Cooperative Education 4: Land Surveying
1 Credit. 0 Lecture Hour. 20 Lab Hours.
Students seeking a bachelor's degree participate in a 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: SUR 393

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: SUR 300 and SUR 305

SUR 465 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: SUR 120 and SUR 200

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. Students also prepare for and take the National Council of Examiners for Engineering and Surveying (NCEES) Fundamentals of Surveying exam.
Prerequisites: SUR 200 and SUR 310

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 a 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: SUR 194 or SUR 292

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 a 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: SUR 491