

# SURVEYING AND MAPPING, BS

## Bachelor of Science in Surveying and Mapping (298103BS)

More on the Land Surveying and Surveying and Mapping programs (<https://www.uakron.edu/engineering/ce/undergraduate/surveying-mapping/>)

### Program Information and Program Description

The Bachelor of Science in Surveying and Mapping program is an upper level degree program designed to provide the student with additional education beyond the A.A.S. degree in Land Surveying. This degree is also designed to meet the formal education requirements for registration as a Professional Surveyor in the state of Ohio.

This upper level degree program is defined as follows:

- The first two years are completed as an AAS degree in Land Surveying (<https://bulletin.uakron.edu/undergraduate/colleges-programs/engineering-polymer-science/civil-engineering/land-surveying-aas/>) or similarly based program.
- Two of the remaining three years are for the completion of prescribed course work.
- The remaining year of the three years is devoted to a cooperative work experience in the surveying and mapping field. The student normally enters the co-op segment between the junior and senior years.

The BS in Surveying and Mapping degree program includes classroom, laboratory, and industry experiences which stress the application of established surveying and mapping knowledge.

This degree program is accredited by the Applied and Natural Science Accreditation Commission of ABET, <http://www.abet.org>.

### Requirements for Admission

Applicants for the Surveying and Mapping program must hold an associate degree in Land Surveying from an accredited program or provide an equivalent academic background. The applicant must meet all minimum requirements for admission into The University of Akron. Applicants with an associate degree in a discipline other than Land Surveying will be required to complete a specific formal set of courses as specified at the time of admission. Final approval for admission is based upon recommendations from the Director of the Surveying and Mapping Program.

### Cooperative Work Study Requirement

The required Cooperative Work Study experience of the Surveying and Mapping program consists of 52 weeks of surveying work experience which may begin after the student has completed 34 hours of course work in the Surveying and Mapping program. This program may be satisfied by any one of the following options:

1. One calendar year with appropriate cooperative education course registration.

2. Three semesters (Summer I and II counts as one semester for the co-op) with appropriate cooperative education course registration.
3. Department review of prior or concurrent work experience.

Students having prior or concurrent work experience should submit to the Surveying and Mapping Co-op Review Committee appropriate documentation before signing their program contract. The Surveying and Mapping Co-op Review Committee will determine whether this work experience satisfies the co-op requirement. All students must be cleared through the Cooperative Education Office.

### Requirements for Graduation

- Compliance with the requirements of the general education program as outlined in the Bulletin.
- Completion of the requirements for the associate degree in Land Surveying at The University of Akron or an approved associate degree program. Students transferring from another institution must have their transcripts evaluated to ensure that they have the required number of credits in surveying courses. Those found deficient must complete lower level surveying course work before upper level surveying and mapping courses can be taken.
- Successful completion of a minimum of 120 credits in the B.S. in Surveying and Mapping program including the associate degree program, the general education courses, the one-year co-op, and the Year 3, Year 4, and Year 5 course requirements.

The following information has official approval of **The Department of Civil Engineering** and **The College of Engineering and Polymer Science**, but is intended only as a supplemental guide. Official degree requirements are established at the time of transfer and admission to the degree-granting college. Students should refer to the Degree Progress Report (Stellic) which is definitive for graduation requirements. *Completion of this degree within the identified time frame below is contingent upon many factors, including but not limited to: class availability, total number of required credits, work schedule, finances, family, course drops/withdrawals, successfully passing courses, prerequisites, among others.* The transfer process is completed through an appointment with your academic advisor.

### Requirements Summary

Code	Title	Hours
General Education Requirements ( <a href="https://bulletin.uakron.edu/undergraduate/general-education/">https://bulletin.uakron.edu/undergraduate/general-education/</a> ) *		
	General Education	15
	Mathematics	7
	Geographic Information Systems	3
	Surveying Core	28
	Safety and Business Practices	3
	Technical Electives	4
<b>Total Hours</b>		<b>60</b>

\* Several courses required for the major also satisfy General Education requirements. The University minimum of 36 credits are required for General Education and credit for these courses will apply to multiple requirements.

## General Education Courses

Code	Title	Hours
Students pursuing a bachelor's degree must complete the following General Education coursework. Diversity courses may also fulfill major or Breadth of Knowledge requirements. Integrated and Applied Learning courses may also fulfill requirements in the major.		
<b>Academic Foundations</b>		<b>12</b>
<i>Mathematics, Statistics and Logic: 3 credit hours</i>		
<i>Speaking: 3 credit hours</i>		
<i>Writing: 6 credit hours</i>		
<b>Breadth of Knowledge</b>		<b>22</b>
<i>Arts/Humanities: 9 credit hours</i>		
<i>Natural Sciences: 7 credit hours</i>		
<i>Social Sciences: 6 credit hours</i>		
<b>Diversity</b>		
Domestic Diversity		
Global Diversity		
<b>Integrated and Applied Learning</b>		<b>2</b>
<i>Select one class from one of the following subcategories:</i>		
Complex Issues Facing Society		
Capstone		
<i>Review the General Education Requirements page for detailed course listings.</i>		
<b>Total Hours</b>		<b>36</b>

## General Education (beyond the AAS Land Surveying)

Code	Title	Hours
<b>Discipline-Specific General Education</b>		
ENGL 222	Technical Report Writing (for Writing Second Course Requirement)	3
PHIL 120	Introduction to Ethics	3
<b>Other General Education</b> <sup>1,2</sup>		
Fine Arts and Humanities Requirement		9
<b>Total Hours</b>		<b>15</b>

<sup>1</sup> Students are advised that the General Education classes should be chosen to also meet the Domestic Diversity and Global Diversity Requirements; otherwise, extra General Education classes may be needed to complete these requirements.

<sup>2</sup> Students entering with associate degrees other than the AAS Land Surveying at UA may have BS General Education requirements to complete beyond those shown. Students complete the following BS General Education requirements during the AAS Land Surveying: Mathematics, Statistics, and Logic; Speaking; Writing First Course; Natural Science with lab (7 credits); and three credits of Social Science.

## Mathematics

Code	Title	Hours
MATH 255	Technical Calculus I	3
MATH 345	Technical Data Analysis	2

MATH 360	Advanced Mathematics for Surveyors	2
<b>Total Hours</b>		<b>7</b>

## Geographic Information Systems

Code	Title	Hours
SURV 201	Intermediate Geographic and Land Information Systems	3
<b>Total Hours</b>		<b>3</b>

## Surveying Core

Code	Title	Hours
SURV 310	Survey Computations & Adjustments	2
SURV 315	Boundary Control & Legal Principles	3
SURV 330	Applied Photogrammetry	3
SURV 340	Cadastral Surveying	2
SURV 410	LiDAR and Laser Scanning	2
SURV 415	Legal Aspects of Surveying	3
SURV 421	Subdivision Design	3
SURV 422	Global Positioning System Surveying	3
SURV 427	Ohio Lands	2
SURV 430	Surveying Project	3
SURV 431	Senior Seminar	2
<b>Total Hours</b>		<b>28</b>

## Safety and Business Practices

Code	Title	Hours
<b>This requirement is met with both SURV 325 and SURV 335, or alternatively with CIVE 471</b>		
SURV 325 & SURV 335 or CIVE 471	Safety for Surveyors and The Business of Surveying Construction Administration	3
<b>Total Hours</b>		<b>3</b>

## Technical Electives

Code	Title	Hours
<b>Take four credits from the following:</b>		
		<b>4</b>
SURV 325	Safety for Surveyors <sup>1</sup>	
SURV 335	The Business of Surveying <sup>1</sup>	
SURV 426	History of Surveying To 1785	
SURV 428	History of Surveying Since 1785	
SURV 445	Applications in GIS using GPS	
SURV 450	Topics in Professional Practice	
SURV 489	Special Topics in Surveying	
SURV 490	Workshop in Surveying	
SURV 495	Internship: Surveying and Mapping	
SURV 497	Surveying Honors Project	
SURV 498	Independent Study	
SURV 205	Building Geodatabases	

<sup>1</sup> SURV 325 and SURV 335 can be used as Technical Electives only if not used for the Safety and Business Practices requirement.

## Recommended Sequence

The first two years of the BS in Surveying and Mapping program are completed as an AAS in Land Surveying (60 credits) or similar associate degree. A minimum of 120 credit hours are required for this degree. All University General Education requirements must be met.

2nd Year		Hours
<b>Summer Semester</b>		
GNE 300	Cooperative Education Work Period <sup>3</sup>	0
<b>Hours</b>		<b>0</b>
<b>3rd Year</b>		
<b>Fall Semester</b>		
MATH 345	Technical Data Analysis	2
SURV 310	Survey Computations & Adjustments	2
SURV 201	Intermediate Geographic and Land Information Systems	3
ENGL 222	Technical Report Writing	3
PHIL 120	Introduction to Ethics	3
SURV 325 & SURV 335 or CIVE 471	Safety for Surveyors or Construction Administration	3
<b>Hours</b>		<b>16</b>
<b>Spring Semester</b>		
MATH 255	Technical Calculus I	3
MATH 360	Advanced Mathematics for Surveyors <sup>5</sup>	2
SURV 315	Boundary Control & Legal Principles <sup>1</sup>	3
SURV 330	Applied Photogrammetry	3
SURV 340	Cadastral Surveying	2
	Arts and Humanities requirement <sup>4</sup>	3
<b>Hours</b>		<b>16</b>
<b>Summer Semester</b>		
GNE 403	Cooperative Education Work Period III	0
<b>Hours</b>		<b>0</b>
<b>4th Year</b>		
<b>Fall Semester</b>		
SURV 415	Legal Aspects of Surveying	3
SURV 422	Global Positioning System Surveying	3
SURV 430	Surveying Project	3
SURV 450	Topics in Professional Practice (or other 2-credit Technical Elective)	2
	Arts and Humanities requirement <sup>4</sup>	3
<b>Hours</b>		<b>14</b>
<b>Spring Semester</b>		
SURV 410	LiDAR and Laser Scanning	2
SURV 421	Subdivision Design	3
SURV 427	Ohio Lands	2
SURV 431	Senior Seminar	2
SURV 489	Special Topics in Surveying (or other 2-credit Technical Elective)	1-3
	Arts and Humanities requirement <sup>4</sup>	3
<b>Hours</b>		<b>13-15</b>
<b>Total Hours</b>		<b>59-61</b>

<sup>1</sup> Traditionally Spring only (See Program Contact).

<sup>2</sup> Traditionally Fall only (See Program Contact).

<sup>3</sup> This is the semester after finishing the AAS in Land Surveying. If a student is not able to complete a co-op this summer, the two co-op terms can be completed in the summers following the third and fourth year, for a summer graduation with the BS.

<sup>4</sup> Students are advised that the General Education classes should be chosen to also meet the Domestic Diversity and Global Diversity Requirements; otherwise, extra General Education classes may be needed to complete these requirements.

<sup>5</sup> This class is typically offered only **every other year** in Spring. Students should take care to take it as early as they can.

**Policy Alert: By the end of your first 48 credit hours attempted, you must have completed your required General Education English, Mathematics, and Communications (Speech) requirements.**