

Bachelor of Science in Geomatics

The Bachelor of Science (BS) in Geomatics prepares students for a career in surveying and mapping, Geographic Information Systems (GIS), remote sensing, and related professional fields. Geomatics integrates disciplines of land surveying and mapping, geodesy, hydrography, remote sensing, photogrammetry, LiDAR/point clouds, and GIS. The Geomatics program is the only program statewide to provide the level of education required by the State of Alaska in obtaining professional land surveyor licenses.

The Bachelor of Science in Geomatics is accredited by the Applied and Natural Sciences Accreditation Commission of ABET (<https://www.abet.org>).

Licensure and/or Certification

Graduates of the BS in Geomatics gain four years of education credit toward obtaining a professional land surveyor license in Alaska.

Please go to UAA's Authorization by State (https://www.uaa.alaska.edu/academics/office-of-academic-affairs/provost_office/uaa-state-authorization/authorization.cshtml/) website for information about licensure or certification in a state other than Alaska.

Admission Requirements

- Complete the Admission Requirements for Baccalaureate Degrees (<http://catalog.uaa.alaska.edu/academicpoliciesprocesses/admissions/undergraduate/>).

Special Considerations

- Students who intend to enroll in this degree of study are strongly encouraged to complete the following courses in high school with a C or better: Mathematics - Algebra and Trigonometry (2 semesters), Natural Science such as Chemistry, Physics, Biology, or Geology (1 year), English Composition - Skill level as demonstrated by ACT, SAT, or approved placement test to qualify for enrollment in WRTG A111. Insufficient preparation may increase the number of semesters required to complete the degree.
- A student who is unable to earn a minimum grade of C in a major requirement course during their initial enrollment may attempt to earn a satisfactory grade one additional time on a space-available basis. Failure to earn a minimum grade of C on the second attempt may result in removal from the geomatics program.

Graduation Requirements

- Complete the General University Requirements for Baccalaureate Degrees (<http://catalog.uaa.alaska.edu/undergraduateprograms/baccalaureaterequirements/>).
- Complete the General Education Requirements for Baccalaureate Degrees (<http://catalog.uaa.alaska.edu/undergraduateprograms/baccalaureaterequirements/gers/>).

- The 3 credit Tier 1 Quantitative Skills GER will be met and exceeded by the following degree requirements: (MATH A151 & MATH A152) OR MATH A155, MATH A251 and MATH A252.
- The 7 credit Tier 2 Natural Science GER will be met and exceeded by the 11-12 credit Natural Sciences Elective degree requirement.
- For 3 credits of Tier 2 Humanities GER, choose PHIL A305.
- Complete the following major requirements with a minimum grade of C:

Code	Title	Credits
Core Courses		
BA/JUST A241	Business Law I	3
BA A300	Organizational Theory and Behavior	3
ESM A450	Economic Analysis and Operations	3
GIS A101	Introduction to Geographic Information Systems	3
GIS A201	Intermediate Geographic Information Systems	3
GIS A351	Remote Sensing	3
GEO A460	Geomatics Capstone Project	3
MATH A151 & MATH A152	College Algebra for Calculus and Trigonometry	5-7
or MATH A155	Precalculus	
MATH A251	Calculus I	4
MATH A252	Calculus II	4
MATH A314	Linear Algebra	3
PHIL A305	Professional Ethics	3
STAT A253	Applied Statistics for the Sciences	4
Complete 11-12 credits from the following with at least one lab and 3 credits in PHYS		11-12
ASTR A103 & A103L	Solar System Astronomy and Solar System Astronomy Laboratory	
BIOL A102 & BIOL A103	Introductory Biology and Introductory Biology Laboratory	
BIOL A178 & BIOL A179	Introduction to Oceanography and Introduction to Oceanography Laboratory	
or GEOL A178 & GEOL A179	Introduction to Oceanography and Introduction to Oceanography Laboratory	
CHEM A105 & A105L	General Chemistry I and General Chemistry I Laboratory	
ENVI A211 & A211L	Environmental Science: Systems and Processes and Environmental Science: Systems and Processes Laboratory	

GEOG/ENVI A111	Earth Systems: Elements of Physical Geography	
GEOL A111 & A111L	Physical Geology and Physical Geology Laboratory	
GEOL A115 & A115L	Environmental Geology and Environmental Geology Laboratory	
PHYS A123 & A123L	College Physics I and College Physics I Laboratory	
or PHYS A211 & A211L	General Physics I and General Physics I Laboratory	
PHYS A124 & A124L	College Physics II and College Physics II Laboratory	
or PHYS A212 & A212L	General Physics II and General Physics II Laboratory	
Choose one of the following concentration areas: surveying or geographic information systems (GIS).		42-44
Total		97-102

Surveying Concentration

Code	Title	Credits
GEO A146	Geomatics Computations	3
GEO A156 & A156L	Geospatial Measurement I and Geospatial Measurement I Laboratory	3
GEO A267	Boundary Law I	3
GEO A357	Photogrammetry	3
GEO A359	Geodesy and Map Projections	3
GEO A256 & A256L	Engineering Surveying and Engineering Surveying Laboratory	3
GEO A266 & A266L	Geospatial Measurement II and Geospatial Measurement II Laboratory	3
GEO A364	Spatial Data Adjustments	3
GEO A369	Cadastral Surveys	1
GEO A410	High-Density Surveying	3
GEO A420	Point Cloud Analysis	3
GEO A457	Boundary Law II	3
GEO A466 & A466L	Geopositioning and Geopositioning Laboratory	3
KIN A112	First Aid and CPR for Professionals	1
Complete 6 credits from the following:		6
CSCE A101	Introduction to Computer Science	
ES A106	Engineering Graphics	
GEO A355	Land Development and Design	
GEO A433	Hydrographic Surveying	
GEO A490	Selected Advanced Topics in Geomatics	

GIS A370	GIS and Remote Sensing for Natural Resources	
GIS A301	Web GIS	
GIS A458	Spatial Data Management	
GIS A466	Spatial Analysis	
GIS A467	Image Analysis	
GIS A498	Individual Research ¹	
Total		44

Geographic Information Systems (GIS) Concentration

Code	Title	Credits
CSCE A101	Introduction to Computer Science	3
GIS A301	Web GIS	3
GIS A458	Spatial Data Management	3
GIS A466	Spatial Analysis	3
GIS A467	Image Analysis	3
Complete 12 credits from the following (at least 6 credits must be upper-division courses):		12
CSCE A490	Topics in Computer Science and Computer Systems Engineering	
ES A106	Engineering Graphics	
GEO A146	Geomatics Computations	
GEO A156 & A156L	Geospatial Measurement I and Geospatial Measurement I Laboratory	
GEO A359	Geodesy and Map Projections	
GEO A490	Selected Advanced Topics in Geomatics	
GEOG A375	Environmental Applications of Geographic Information Systems (GIS)	
GIS A370	GIS and Remote Sensing for Natural Resources	
GIS A498	Individual Research ¹	
Complete an additional 15 credits in CSCE, MATH (excluding MATH A420 and MATH A495A), STAT, GEOG, ECON, BA, or HS. Six of these credits must be upper-division courses.		15
Total		42

¹ A maximum of 6 credits of may be applied to degree requirements.

A minimum of 120 credits is required for the degree, of which 42 must be upper-division.

Honors in Geomatics

The Bachelor of Science in Geomatics recognizes distinguished achievement by conferring programmatic honors in geomatics. In order to receive honors in geomatics, a student must meet the following requirements:

- Complete all requirements for a BS in Geomatics.
- Meet the UAA requirements for Graduation with Honors (<https://catalog.uaa.alaska.edu/academicpoliciesprocesses/academicstandardsregulations/graduation/>).
- Have a minimum GPA of 3.50 in their courses required for the major.
- Document a minimum of eight weeks of work experience while a student at the University of Alaska Anchorage in geomatics or related position.

Program Student Learning Outcomes

Students graduating with a Bachelor of Science in Geomatics will be able 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.
- Formulate or design a system, process, procedure or program to meet desired needs.
- Develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions
- Communicate effectively with a range of audiences
- Understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts
- Function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty.
- Apply knowledge in all six areas of surveying and mapping:
 - Field surveying and methods;
 - Photogrammetric mapping, image interpretation and remote sensing;
 - Surveying calculation and data adjustment;
 - Geodetic coordinates and astronomy;
 - Cartographic representation, projections, and map production;
 - Computer-based multipurpose cadastre, geographic information systems.