GEOMATICS DEPARTMENT
SURVEY OPTION
Oregon Institute of Technology
NWCCU Assessment Report
2019-2020 Academic Year

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1 Program Introduction

1.1 Program History

Geomatics education has been offered virtually since the inception of the Oregon Institute of Technology, with an associate degree in Surveying initiated in 1951. The program was accredited by the Engineer's Council on Professional Development (ECPD) in 1953. ECPD is now recognized as ABET. A baccalaureate Surveying Technology degree was offered in 1966 and accredited by TAC-ABET in 1970. The program was one of the first two Bachelor of Science surveying programs nationwide to receive RAC-ABET accreditation in 1984. The geomatics program has enjoyed 67 years of continuous accreditation under ABET or its predecessor, ECPD. Oregon Tech can be proud of having the oldest BS Geomatics program in the nation. The degree title of the program was officially changed from Surveying to Geomatics in 2001, reflecting a global trend recognizing the broadening of the profession and the impact of a revolution in advanced technology. Since 2007, the department has offered the BS Surveying option (former BS Geomatics degree) and the BS GIS option on the Klamath Falls campus.

1.2 Enrollment Trends (Geomatics - Surveying Option Students)

Table 1-1 Geomatics department enrollment trends

Fall Terms	Year (2015-16)	Year (2016-17)	Year (2017-18)	Year (2018-19)	Year (2019-20)
Full-time Students	37	30	41	34	38

Reported values represent enrollment during the fourth week of the fall quarter as recorded by Oregon Tech Institutional Research.

1.3 Recent Number of Graduates

Table 1.2 shows the number of geomatics degrees (Survey Option) awarded over the last five years.

Table 1-2 Geomatics - Survey Option degrees awarded

Fall Terms	Year (2015-16)	Year (2016-17)	Year (2017-18)	Year (2018-19)	Year (2019-20)
The number of degrees awarded	12	7	6	6	13

Reported values represent graduations as recorded by Oregon Tech Institutional Research for the Geomatics-Survey Option.

2 Program Summary

2.1 Geomatics Department Mission, Objectives, and Program Student Learning Outcomes (PSLOs)

2.1.1 Department Mission

The mission of the Geomatics Department is to provide students with fundamental knowledge and skills in the geomatics discipline. The Surveying Option prepares students to pass the Fundamentals of Surveying (FS) examination and pursue licensure as a registered Professional Land Surveyor (PLS). The GIS Option prepares

students to become certified GIS Professionals. All students learn the professional responsibility of protecting the health, safety and welfare of the public, and become aware of global and cultural issues.

2.1.2 Program Educational Objectives

Program educational objectives are statements that describe the expected accomplishments of graduates during the first few years after graduation, usually 3-5 years. These objectives are consistent with the mission of the program and the institution**.**

Graduates of the Oregon Tech Geomatics Options will:

1. Acquire the ability to obtain professional licensure and/or certifications in the geospatial industry.
2. Advance in the geospatial industry during their career by becoming involved in local, state, national, or international professional organizations.
3. Obtain industry positions requiring increased responsibility.
4. Assume responsibility for lifelong learning in professional and personal development.
5. Demonstrate readiness for graduate education and/or advanced technical education.

2.1.3 Program Student Learning Outcomes (PSLO)

(1) 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.
(2) An ability to formulate or design a system, process, procedure or program to meet desired needs.
(3) An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.
(4) An ability to communicate effectively with a range of audiences.
(5) An ability to understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts.
(6) An ability to function effectively in teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty.

Note: The expected learning outcomes for the survey option are based on ABET/ASAC accreditation criteria.

2.2 Survey Option Student Learning Opportunities

Geomatics student professional learning opportunities include:

1. Geomatics Student Club community service activities. Each year, students in the Geomatics Club are encouraged to take on survey/GIS-related projects that benefit the community. These projects provide the students with exposure to real-world projects, negotiations, and fulfillment of a specific scope of work, as well as the opportunity to work with other disciplines.
2. The National Society of Professional Surveyors (NSPS) National Geomatics Student Competition. If a critical mass of students are committed to participating, a fundraising drive is initiated to supplement funding provided by the department and professional organizations. In 2020, two Geomatics students won the NSPS Student Project of the Year, which involved a surveying/GIS application.
3. Professional Land Surveyors of Oregon (PLSO) annual conference. Students volunteer as runners to assist with conference details, attend technical paper presentations, and staff an Oregon Tech Geomatics department booth.

4. GME 468 Geomatics Practicum. Students are responsible for completing several community service projects for city, county, state, and federal agencies.
5. Industry speakers are invited to present at the PLSO Student Chapter meetings.
6. Students are encouraged to participate in professional organizations, such as becoming a student member of PLSO.

3 Summary of Six-Year Assessment Cycle

Table 3.1 shows the six-year PSLO/ISLO assessment cycle for the geomatics survey option. It indicates the PSLO/ISLO, the academic year, and the course where the learning outcome will be assessed (ISLO: Oregon Tech's Institutional Student Learning Outcomes).

Table 3-1 Six-Year Assessment Cycle

PSLO	ISLO	AY 14/15	AY 15/16	AY 16/17	AY 17/18	AY 18/19	AY 19/20
(1) 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.	6		GME175 GIS306			GME175 GIS306	
(2) An ability to formulate or design a system, process, procedure or program to meet desired needs.	4		GIS306 GME468			GIS306 GME468	
(3) An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.	2			GME241 GIS316			GME241 GIS316
(4) An ability to communicate effectively with a range of audiences.	1			GME161 GME468			GIS205 GME468
(5) An ability to understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts.	3	GME162 GME454/455			GME162 GME454/455		
(6) An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty.	5	GIS205 GME468			GIS205 GME468		

Additional PSLO Assessments							
Review FS Exam Results		X	X	X	X	X	X
Review IAB comments		X	X	X	X	X	X
Alumni Survey				X			X
Employer Survey		X			X		

NOTE: The IAC did not meet during the pandemic years 2019 through 2022 and is being reconstituted as many members retired from their employment and did not continue to serve in the IAC. Alumni and Employer surveys are typically conducted at the Annual PLSO Conference, which was suspended and disrupted during the pandemic.

4 Summary of Current Academic Year Assessment Activities

Table 4.1 summarizes the Program Student Learning Outcomes (PSLOs) assessed during the 2019/2020 academic year. The matrix also indicates what course the outcome will be assessed in, the quarter of assessment, the instructor who will perform the assessment, and the method that will be utilized.

Table 4-1 – PSLOs evaluated during the 2019/2020 assessment cycle.

PSLO	Course	Faculty	Term	Method
(3) An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.	~~GME 241~~	~~Marker~~	~~Spring 2019~~	~~Dashboard Poster~~
	GIS 134	Ritter	Winter 2020	Comprehensive Practical Exam
(4) An ability to communicate effectively with a range of audiences.	~~GIS 205~~	~~Ritter~~	~~Spring 2020~~	~~Examination questions Assignments~~
	~~GME 468~~	~~Marker~~	~~Spring 2020~~	~~Term Paper~~

Note: GME241, GIS205, and GME468 were not included in this process because enrollments were low, and assignments were not related to PLSO 3 and 4.

4.1 Summaries of individual assessment activities

4.1.1 PSLO (3): An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.

Performance Criteria:

GIS 134 Students must develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.

Students are rated based on the following scores:

1) Below 50% of the score
2) Above 50% of the score

3) Above 60% of the score
4) Above 70% of the score
5) Above 80% of the score

4.1.1.1 GIS 134

Table 4-2 Rubric For
PLSO (3): An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions. GIS 134 – Geographic Information Systems

Performance Criteria	**Below 50% of the score (1)**	**Above 50% of the score (2)**	**Above 60% of the score (3)**	**Above 70% of the score (4)**	**Above 80% of the score (5)**
Ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.	Little or no ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.	Some, but limited ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.	Some limitations on the ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.	Ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.	Excellent ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.

Departmentally Expected Score:

For PSLO (3), the Geomatics Department expects 70% of students to score a 4 or 5 in all categories.

Table 4-3 GIS 134: Assessment results

Performance Criteria	**Assessment Method**	**Measurement Scale**	**Minimum Acceptable Performance**	**Results**
Comprehensive Practical Exam	Score	1 to 5 scale	70%	85%

Table 4-4 GIS 134: The number of students assessed. Appendix A

Performance Criteria / Number of Students Assessed	**Below 50% of the score (1)**	**Above 50% of the score (2)**	**Above 60% of the score (3)**	**Above 70% of the score (4)**	**Above 80% of the score (5)**	**Total**
Comprehensive Practical Exam	1	0	0	2	17	20

Actions to be taken:

The comprehensive practical exam met the departmental-established minimum of 70%.

4.1.2 PSLO (4) An ability to communicate effectively with a range of audiences.

Performance Criteria:

GIS 205 and GME 468 students must demonstrate the ability to communicate effectively with a range of audiences. However, there were no assignments related to PSLO (4). Therefore, there were no results during 2019-20.

5 Evidence of Student Learning

5.1 Summary of Department Discussions on Assessment Activities

September 18, 2019 – Geomatics Department Faculty Meeting (Convocation)

The department faculty met and discussed the following items with respect to assessment:

- Changes made to the PLSOs during the 2018/19 academic year to align with the new ABET 1-6 student outcomes were retained so that the six-year cycle would be in sync with the new PSLOs.
- Review the department mission statement and program objectives (Required by OT)
- Review and decide on the adaptation of new student outcomes based on ABET move from a-k to 1-7 in the EAC accreditation process
- Identify courses in which assessments will take place and assign each instructor task of identifying assignment/test/project to be assessed and preparing assessment criteria and rubric.
- Review and edit 6-year assessment schedule based on item 3 (academic years 2018/19 – 2023/24)

6 "Closing the Loop" – Changes Resulting from Assessment

The following is a summary of areas identified during the last assessment cycle as areas that need additional monitoring or improvement:

No significant shortcomings were identified, and with the department currently understaffed, no major curriculum changes will be undertaken.

A new assessment schedule was prepared. Student progress and student learning objectives would be adequately assessed.

7 NCEES Fundamentals of Surveying Exam Results –

The department expectation for students taking the NCEES Fundamentals of Surveying Exam is 90%. The data available from NCESS for this assessment cycle shows that students passing this exam are at 86% (Fall 2019) and 100% (Spring 2019), respectively. Students are required to take the FS exam as a graduation requirement and are encouraged to form study groups during the winter term and take the exam during the spring quarter of their senior year.

8 Appendices

8.1 Appendix A: GIS 134