GEOMATICS DEPARTMENT
SURVEY OPTION
Oregon Institute of Technology
NWCCU Assessment Report
2010/2011

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 Bachelors of Science surveying programs in the nation to receive RAC-ABET accreditation in 1984. The geomatics program has enjoyed 57 years of continuous accreditation under ABET or its predecessor, ECPD. OIT can be proud of having the oldest BS Geomatics program in the nation! The program degree title 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. As of 2007 the department now offers the BS Surveying option (former BS Geomatics degree), and the new BS GIS option.

1.2 Enrollment Trends

Fall Terms	Year (2006-07)	Year (2007-08)	Year (2008-09)	Year (2009-10)	Year (2010-11)
Full-time Students	46	65	67	72	61

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

Table 1.1 – Geomatics enrollment trends

1.3 Retention Rates

Fall Terms	Year (2004-05)	Year (2005-06)	Year (2006-07)	Year (2007-08)
First-time Freshman	0 (0%) (n=1)	5 (55.6%) (n=9)	6 (100%) (n=6)	2 (40%) (n=5)
Continuing Freshman: Changed major	0	2	0	0
Full-Time New Transfers	6 (86%) (n=7)	7(100%) (n=7)	3 (75%) (n=4)	TBD

Reported values are from OIT Institutional Research retention and graduation rates statistics.

Table 1.2 – Geomatics Retention Rates

1.4 Recent Number of Graduates

A summary of the number of geomatics degrees (GIS option) awarded for the last 5 years is shown below.

Fall Terms	Year (2003-04)	Year (2004-05)	Year (2005-06)	Year (2006-07)	Year (2007-08)
First-time Students	7	10	7	10	7

Table 1.3 – Geomatics degrees awarded

1.5 Employment Rates and Salaries

Graduates are asked to report whether they have passed the NCEES Fundamentals of Land Surveying (FS) examination. Senior students are eligible to sit for the FS in April, and are notified of exam results in June. NCEES is now providing tabulated exam results, which greatly enhances tracking statistics.

Historically, the number of graduates returning Career Services graduate survey forms has been low, for example only 2 responses from the 10 graduates of the class of 2006. Geomatics faculty contact graduates and assist Career Services with obtaining significant placement and salary data for graduates. The ten graduates who reported employment for the class of 2011 all had found either temporary or permanent employment. Most of the 2011 graduates found employment with either federal or local government. Graduates accepting employment with the federal government typically start at GS-5 or GS-7 wage grade, which is less than $40,000 annually. These graduates will eventually "catch up" with private sector salaries if they remain in government service. This tends to skew the starting salary data in years when significant numbers of graduates accept federal government positions. Private sector graduate salaries have been in the range of $45,000 to $55,000.

2. Program summary

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

The program faculty reviewed and affirmed the mission, objectives, and program student learning outcomes during the fall 2010 convocation. The current version of these items is shown below.

Department Mission

The mission of the Geomatics Department is to provide students with fundamental knowledge and skills in the geomatics and GIS disciplines. 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.

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**.**

Geomatics Department Program Educational Objectives

- Prepare graduates to enter into professional practice
- Provide students with a broad foundation in major geomatics and GIS disciplines
- Prepare students to function effectively on multidisciplinary teams
- Prepare graduates to become licensed or certified professionals.

Program Student Learning Outcomes (PSLO)

(a) An ability to apply knowledge of mathematics, science, and applied sciences
(b) An ability to design and conduct experiments, as well as to analyze and interpret data
(c) An ability to formulate or design a system, process or program to meet desired needs
(d) An ability to function on multi-disciplinary teams
(e) An ability to identify and solve applied science problems
(f) An understanding of professional and ethical responsibility
(g) An ability to communicate effectively
(h) The broad education necessary to understand the impact of solutions in a global and societal context
(i) A recognition of the need for, and an ability to engage in life-long learning

(j) A knowledge of contemporary issues
(k) An ability to use the techniques, skills, and modern scientific and technical tools necessary for professional practice.

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

2.2 Survey Option Student Learning Opportunities

Geomatics student professional learning opportunities include:

1. American Congress on Surveying and Mapping (ACSM) national student surveying competition. Geomatics students organize each year, and begin a fundraising drive to supplement funding provided by professional organizations. Students volunteer as runners to assist with conference details, attend technical paper presentations, and staff the OIT Geomatics department booth.
2. Students attend a variety of regional professional conferences. These include the Professional Land Surveyor's of Oregon (PLSO) annual conference, the Land Surveyor's Association of Washington (LSAW) conference, and the California Land Surveyor's Association conference (CLSA). Students volunteer as runners to assist with conference details, attend technical paper presentations, and staff the OIT Geomatics department booth for recruiting purposes.
3. GME 468 Geomatics Practicum. Students typically form a hypothetical corporation, and are responsible for completing a number of community service projects for city, county, state, and federal organizations and agencies. During the spring 2011 practicum, students worked on a variety of projects ranging from a topographic survey for a local non-profit wanting to install a new on site septic system to work preparing a control network around the OIT campus.
4. Industry speakers are invited to make presentations at the PLSO Student Chapter meetings.

3. **Summary of Three-Year Assessment Cycle**

Table 3.1 shown below depicts the PSLO/ISLO three year assessment cycle for the geomatics survey option. The table below indicates the PSLO/ISLO and the academic year and quarter where the learning outcome will be assessed.

PSLO	ISLO	AY 09/10	AY 10/11	AY 11/12
(a) an ability to apply knowledge of mathematics, science, and applied sciences	6		Fall Spring	
(b) an ability to design and conduct experiments, as well as to analyze and interpret data	-		Winter Spring	
(c) an ability to formulate or design a system, process or program to meet desired needs	4			Winter Spring
(d) an ability to function on multi-disciplinary teams	2	Fall Spring		
(e) an ability to identify and solve applied science problems	-		Winter	
(f) an understanding of professional and ethical responsibility	3	Fall		
(g) an ability to communicate effectively	1		Winter	Winter
(h) the broad education necessary to understand the impact of solutions in a global and societal context	8	Winter		
(i) a recognition of the need for, and an ability to engage in life-long learning	5		Fall	Winter Spring
(j) a knowledge of contemporary issues	-			Winter Spring
(k) an ability to use the techniques, skills, and modern scientific and technical tools necessary for professional practice	7	Winter Spring		

Table 3.1 – Three Year Assessment Cycle

4. Summary of Current Academic Year Assessment Activities

4.1 Matrix Summary of 2010/2011 PSLO/ISLOs.

Table 4.1 summarizes the PSLO/ISLOs that will be assessed during the 2010/2011 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.

PSLO	ISLO	Course	Faculty	Term	Method
(a) an ability to apply knowledge of mathematics, science, and applied sciences	-	GME 451 GME 444	Walker Walker	Fall Spring	Exam Problem Lab Exercise
(b) an ability to design and conduct experiments, as well as to analyze and interpret data	-	GME 452 GME 351	Walker Marker	Winter Spring	Project Project
(e) an ability to identify and solve applied science problems	-	GME 452	Walker	Winter	Project
(g) an ability to communicate effectively	1	GME 466 GME 454	Duryea Marker	Winter Winter	Paper + Presentation Presentation
(i) a recognition of the need for and an ability to engage in life-long learning	5	GME 373	Duryea	Fall	Paper

Table 4.1 – PSLO/ISLO to be evaluated during the 2010/2011 academic year

4.2 Summaries of individual assessment activities

4.2.1 PSLO (a) / ISLO (6) – "Students will demonstrate an ability to apply knowledge of mathematics, science, and applied sciences".

Fall Quarter 2010 PSLO(a)/ISLO (6) Assessment in GME 451- Geodesy

The students in GME 451 (Geodesy) were evaluated by exam for their ability to apply knowledge of mathematics to a practical problem. The students were expected to be able to perform the following on their final exam:

1. 2D or 3D coordinate computations were used to assess the student's ability to perform a standard computation.
2. Students were asked to explain the gravitational potential effect referred to as the "orthometric correction" as a measure of comprehension of applied science knowledge.

3. Students were asked to complete a mathematical proof, or explain theoretical concepts.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Computation	Exam Problem	Percent Completion	70%	80%
Comprehension of Applied Science Knowledge	Exam Problem	Percent Completion	70%	70%
Understanding of computed results and/or theoretical concepts	Exam Problem	Percent Completion	70%	60%

Table 4.2 – Student performance on PSLO (a) / ISLO (6) Fall Quarter, 2010

Assessment Results

Class performance meets the minimum criteria except for "understanding of computed results and/or theoretical concepts". The instructor was looking for students to answer this question with the equation $W = V + \Phi$, followed by an explanation of underlying concepts. Students were generally able to explain concepts, but tended to omit the formula to support their reasoning. It appears that interpretation of this exam question is responsible for students falling below minimum performance. In the future this question will be re-worded to "list the appropriate equation, and explain underlying concepts".

Actions to be taken

The wording of the exam question will be changed in order to better clarify the expectations. This same assessment was conducted in the 2008-2009 assessment cycle with all scores above 70%. This indicates there may be some differences in understanding related to class composition as well.

Spring Quarter 2011 PSLO(a)/ISLO (6) Assessment in GME 444 - Least Squares Adjustment

The students in GME 444 (Least Squares Adjustment) were evaluated by exam for their ability to apply knowledge of mathematics and statistics to applied measurement problems. The students were expected to be able to perform the following on their final exam:

1. Understand random errors adjustment
2. Understand two least squares adjustment techniques
3. Understand variance-covariance matrix propagation
4. Understand error ellipses for points and lines

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Understand random errors adjustment concepts	Exam Problem	Percent Completion	70%	84%
Understand two least squares adjustment techniques	Exam Problem	Percent Completion	70%	80%
Understand variance-covariance matrix propagation	Exam Problem	Percent Completion	70%	83%
Understand error ellipses for points and lines	Exam Problem	Percent Completion	70%	71%
Understand the concept of pre-analysis	Exam Problem	Percent Completion	70%	86%

Table 4.3 – Student performance on PSLO (a) / ISLO (6) Spring Quarter, 2010

Assessment Results

Class performance meets or exceeds the minimum acceptable performance criteria in all areas of this assessment. The lower than expected performance in the area of "understanding error ellipses for points and lines" is most likely due to the wording of the exam questions as students were able to work successfully with this concept in both homework and lab exercises. Faculty will monitor performance of this concept during the next offering of the class to insure that there is not a weakness in the course design.

Actions to be taken

With all items exceeding the minimum acceptable performance level, no formal action will be taken at this time. However, faculty will re-examine the low understanding of error ellipses to determine if this number represents a poor test question or if the presentation of this item needs to be changed in the course curriculum.

4.2.2 PSLO (b) – "Students will demonstrate and conduct experiments, as well as to analyze and interpret data"

PSLO (b) was assessed by a rubric evaluation of a lab project in the GME 351 (Construction and Engineering Surveying) course. For this project, students were given basic design criteria for a medical office complex and provided minimum accuracy specifications for their control network, design calculations, and final layout work. The

project was designed to provide students with experience performing a complete engineering/construction survey from beginning to end with specifications matching those they would expect to find on a typical office complex design/build project. Student's final projects were evaluated using a rubric to determine their level of competency.

Performance Criteria: The student will

1. Design a survey network that meets the requirements listed in project specifications.
2. Generate 3D models of existing features and proposed designs using assigned design software.
3. Design a quality control procedure that insures the accuracy of data collected in the field and calculation of design positions in the office.
4. Calculate locations and elevations of critical design points from design plans and correctly locate them in the field.
5. Create a project notebook that presents all field data, calculations, and information on set points in a logical and professional format.
6. Create final design drawings suitable for construction from given project parameters.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Survey network design	Rubric-scored Lab Project	1 to 4 scale	70% score at 3 or 4	95%
3D model generation	Rubric-scored Lab Project	1 to 4 scale	70% score at 3 or 4	84%
Quality control procedure	Rubric-scored Lab Project	1 to 4 scale	70% score at 3 or 4	89%
Calculation of location and elevation for design points	Rubric-scored Lab Project	1 to 4 scale	70% score at 3 or 4	95%
Project notebook	Rubric-scored Lab Project	1 to 4 scale	70% score at 3 or 4	84%
Final design drawings	Rubric-scored Lab Project	1 to 4 scale	70% score at 3 or 4	79%

Table 4.4 – Student performance on PSLO (b), Spring Quarter, 2011

Assessment Results

Class performance meets or exceeds the minimum acceptable performance criteria in all areas for this assessment. The performance results being above 80% for five out of the six performance criteria was expected. The students taking this course are typically in their junior year, very focused on courses that they view as readily applicable to their chosen profession, and enjoy the lab component of the construction surveying course work. While five of the criteria were significantly above the minimum 70%, the 79% for the final design drawings is a cause for concern. While scoring the lab project, the

instructor noted that while the final drawings were generally constructed in a competent fashion, they often were missing details that were included on the drawing checklist that each student was given prior to starting work on this portion of the project. The instructor feels that the skill set exists in each of the students in the class that the performance criteria should be at 90% or above. The 79% result indicates that the students are not paying attention to detail, are to pressed for time on the final drawing, or not fully appreciating the need for complete and accurate design drawings.

Actions to be taken

While all items exceed the minimum acceptable level, the 79% performance level for final design drawings must be improved. While students are given a check list of items that must be placed on the drawing and an example drawing of a similar project, it seems that many choose to ignore the list and simply add information to the drawing as they obtain it and hope that it is all there when they complete the project. To improve this score for the next class, the instructor proposes a mandatory peer review that will be incorporated into the final project grade. This should raise the level of awareness that all items on the drawing check list must be present and, hopefully, insure that the students spend more time editing their drawings before final submission.

4.2.3 PSLO (e) – "Students will demonstrate an ability to identify and solve applied science problems"

Students were asked to demonstrate their ability to solve applied science problems in GME 452 (Map Projections) by utilizing their knowledge of mathematics and map projections to design a low distortion projection for an assigned project site. They were expected to select a projection and define its parameters so that the projection would have minimal distortion over the job site allowing the integration of terrestrial and GNSS measurement systems within a specified error tolerance.

Performance Criteria: The student will

1. Demonstrate the ability to solve an applied science problem.
2. Demonstrate the ability to relate theoretical concepts to an applied problem.
3. Identify and use appropriate resources to aid them in solving an applied science problem.
4. Identify possible solutions to an assigned problem and select a solution that is most effective and efficient.
5. Develop strategies and methodologies for verifying the stated solution.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Ability to solve applied science problem	Rubric-scored Lab Project	1-3 scale	70%	100%
Ability to relate theoretical concepts to applied problems	Rubric-scored Lab Project	1-3 scale	70%	100%
Appropriate use of technical resources	Rubric-scored Lab Project	1-3 scale	70%	100%
Ability to understand appropriate solutions	Rubric-scored Lab Project	1-3 scale	70%	100%
Ability to verify solutions	Rubric-scored Lab Project	1-3 scale	70%	100%

Table 4.5 – Student performance on PSLO (e), Winter Quarter, 2011

Assessment Results

The departmentally established minimum of 70% scoring satisfactory or above was met in all performance criteria. This was a small (10 students) senior level course that is required by all geomatics majors and importance of the course work is emphasized in other courses within the option.

Actions to be taken

Since all performance criteria were met in this course, no further action is required. The instructor for the course did observe that the three category rating system is most likely compressing the results and that opening the rating system out to a four or five category system may provide a more refined gauge against which the student's performance can be measured. When this PSLO is next evaluated, a four or five category system will be used for performance measurement.

4.2.4 PSLO (g) / ISLO (1) – "Students will demonstrate an ability to communicate effectively"

Written Communication

Fall Quarter 2010 PSLO(g)/ISLO (1) Assessment in GME 343- Boundary Surveys

This assessment consisted of students writing a five to seven page paper that asked them to describe what the student expected the lifelong learning requirements will be for a professional in geomatics. This exercise was designed to encourage students to think about the importance of lifelong learning, benefits of membership in professional societies, the need for continuing education, and what credentials will be required of them to advance in their profession. The paper was graded for both content and structure. The results of this assessment look only at the structural components of the paper. The goal of this assessment is to determine the student's ability to communicate their ideas effectively with written communications.

Performance Criteria: The student will

1. Clearly state the purpose and idea of the paper
2. Demonstrate efficient and consistent organization
3. Support arguments with sufficient detail and documentation
4. Utilize a writing style appropriate to a professional report
5. Use standard writing conventions
6. Document all research

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Purpose and Ideas	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	94%
Organization	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	88%
Support	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	94%
Style	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	88%
Conventions	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	75%
Documentation	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	94%

Table 4.6 – Student performance on PSLO (g) / ISLO (1) Fall Quarter, 2010 Assessment of written communication skills

Assessment Results

The students who were evaluated for this assessment met all of the minimum requirements for acceptable performance as summarized in the table above. However, the instructor felt that the students score in the category of "Conventions" was lower than it should be because the students have not had sufficient exposure to a writing style manual. His suggestion is that the department should adapt a style convention and have all papers written and submitted in the department sanctioned style.

Actions to be taken

No formal action will be taken at this time. However, Professor Duryea is evaluating several different style manuals and will select one that will be adopted by the department by fall quarter 2011.

Verbal Communication

This assessment consisted of each student selecting a legal aspect of boundary determination. The student was then asked to prepare a summary of existing case law that covered the topic and then present it to the class. The students were expected to summarize their case studies and provide sufficient graphics to help illustrate the legal concepts being discussed. The student was expected to make use of Microsoft Power Point as a presentation aid.

Performance Criteria: The student will

1. Insure the presentation contains appropriate content
2. Organization is clear and easy to follow
3. Presentation is in a style consistent with professional presentation
4. Delivery is professional
5. Visual aids are utilized effectively

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Appropriate content	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	94%
Organization is clear	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	88%
Presentation style	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	94%
Delivery	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	100%
Visual aids	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	100%

Table 4.7 – Student performance on PSLO (g) / ISLO (1) Winter Quarter, 2010 Assessment of Verbal Communication Skills

Assessment Results

The minimum acceptable performance of 70% was met in all five performance criteria. The lowest category, organization at 88%, is most probably due to the fact that this is geomatics student's first exposure to interpreting and presenting legal case studies. As this requires a somewhat different approach than a typical technical report, most of our students are not yet practiced at it. Given that this is the first time most of them have had to give a presentation using legal cases as the primary documentation, this is an excellent performance.

Actions to be taken

Given the high results for this assessment, no formal actions will be taken. As the GME 466 – Boundary Law II course comes up for review with both the department and the Industrial Advisory Committee, the structure of the presentation assignment will be evaluated, but no significant changes are anticipated.

4.2.5 PSLO (i) /ISLO (5) – "Students will demonstrate a recognition of the need for and an ability to engage in life-long learning"

Fall Quarter 2010 PSLO(i)/ISLO (5) Assessment in GME 343- Boundary Surveys

This assessment consisted of students writing a five to seven page paper that asked them to describe what the student expected the lifelong learning requirements will be for a professional in geomatics. This exercise was designed to encourage students to think about the importance of lifelong learning, benefits of membership in professional societies, the need for continuing education, and what credentials will be required of them to advance in their profession. The paper was graded for both content and structure. The results of this assessment look only at the content components of the paper. The goal of this assessment is to determine the student's understanding of the need for lifelong learning and what will be required for professional development once they leave the university.

Performance Criteria: The student will

1. Define and describe the necessity for lifelong learning
2. Recognize the importance of professional societies and organizations
3. Understand the need for professional credentials
4. Recognize the necessity for continuing education
5. Be able to articulate short and long term career goals

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Lifelong Learning	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	94%
Professional societies and organizations	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	88%
Credentials	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	81%
Continuing education	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	38%
Short and long-term career plans	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	98%

Table 4.8 – Student performance on PSLO (i) / ISLO (5) Fall Quarter, 2010

Assessment Results

Overall, the students who were evaluated for this assessment performed well. One notable exception is in the area of continuing education. The percent of students (38%) who met the minimum acceptable performance was significantly below the department and institutional minimum level of acceptable performance. This result came as a surprise to the faculty given that our students receive significant exposure to the requirement of continuing education. The topic is discussed in the classroom setting and most of our students participate in one or more conferences during their time at OIT where continuing education is the primary focus of the event.

Actions to be taken

With the low score in continuing education, GME faculty will meet and discuss strategies to place this topic in more of our courses. Faculty will also try and stress to students attending conferences that one of the main reasons for the event is continuing education. It is vital that our students understand that to advance in their profession, they will need to continue studying once they leave the classroom.

4.2.6 Professional Exam Results (Fundamentals of Land Surveying)

Each year, geomatics students in the surveying option are eligible to sit for the Fundamentals of Land Surveying (FS) exam given by the State of Oregon. Students may take the exam in either October or April, depending on their graduation date. Our student's ability to pass this exam is a critical measure of the programs success in conveying knowledge to our students as this exam grants entry into the profession of land surveying. Students are expected to work for four years in the profession before being admitted to the professional practice exam, but the FS insures that those entering the profession meet preliminary knowledge requirements for becoming a professional. The

results for the October 2010 and April 2011 exams are summarized in the Table 4.11 below.

Exam Date	Pass Rate
October 2010	100%
April 2011	82%

Table 4.9 – FLS Exam pass rates for October 2010 and April 2011

Assessment Results

The pass rate for OIT Geomatics students was 100% for October and 82% for the April exam. In past assessments, it was noted that our students scored significantly below the national average in the category of probability and statistics (3 Standard Deviations). This test category was re-examined in this year's test results. For the October 2010 exam, our students still fell below the national average, but were gaining. By the April exam, student's scores in this area were above the national average.

Actions to be taken

In the 2009-2010 assessment report, it was stated that faculty would place greater emphasis on probability and statistics in GME 161 (Plane Surveying I) and more would be added to GME 175 (Computations and Platting) but that the results of this would not be apparent until the 2013 test cycle. It was also indicated that temporary measures, such as more statistics in the FS review course, would be utilized to bridge students taking the exam prior to 2013. This strategy seems to be working as the average for OIT students was only one point below the national average on the October exam and was one point higher than the national average on the April exam. It is hoped that when the results of the 2013 exams are released, student performance in probability and statistics will be significantly higher than the national average.

4.2.7 – Senior Exit Survey

At the end of the GME 468 (Senior Practicum) course, students are given the opportunity to answer a short survey regarding their experience in the program. One of the questions asks the student to rate how well prepared they felt that they were for each of the program student learning outcomes a-k. This provides an indirect assessment from the students on how well they feel they have been prepared for each of the objectives stated for the program. The survey is administered online to graduating seniors with the Survey Monkey website.

Performance Criteria: The student will feel that they are prepared or highly prepared in PSLO a-k recognized by the geomatics department

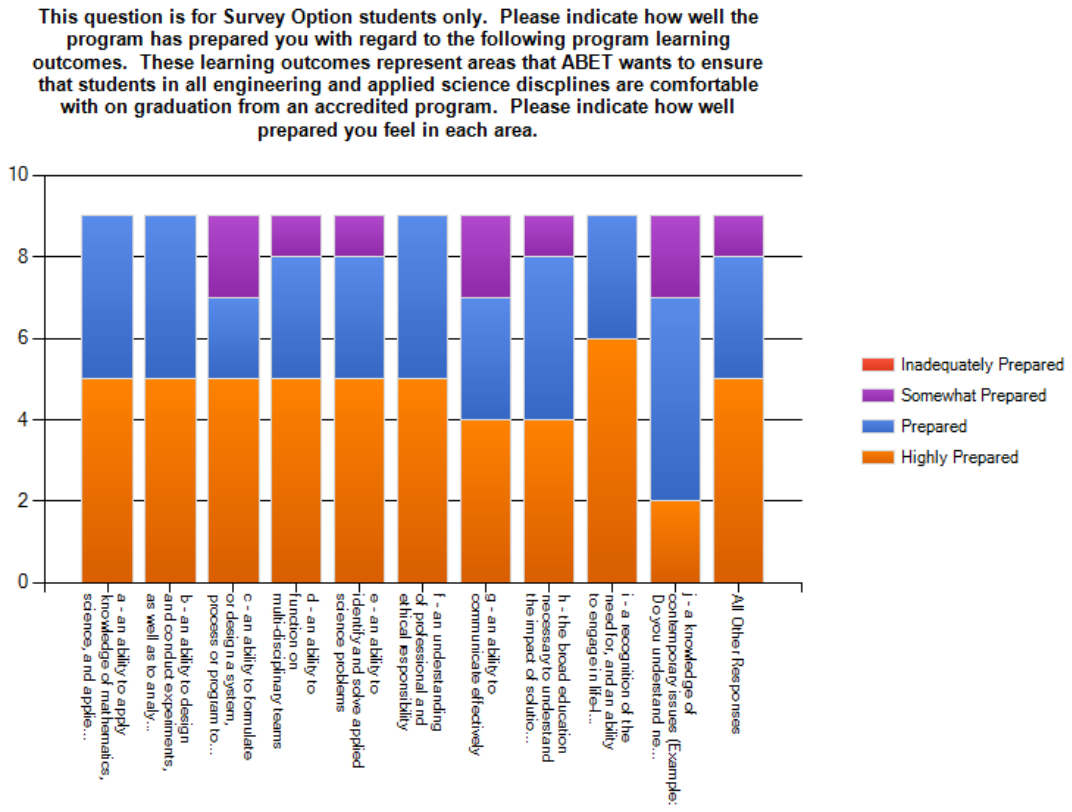

Figure 4.1 – Senior exit survey results for student individual feeling of preparation for each PSLO.

Assessment Results

This year's senior exit survey shows an improvement over the 2009-2010 senior exit survey in terms of the students feeling of how well they are prepared under each of the program student learning outcomes. While not yet attaining the goal of having all respondents indicate that they felt prepared or highly prepared, this years survey has no respondents indicating that they felt inadequately prepared. In the 2009-2010 one student indicated that they felt inadequately prepared for PSLOs (h) and (j). This year's survey indicated that no students felt inadequately prepared for the stated learning objectives. In addition, the 2009/2010 survey had 11% of students feeling that they were only somewhat prepared for one or more of the PSLOs and this survey had only 9% indicating the same. The most probable cause for this improvement is the inclusion of the life long learning assignment in a senior level course. The life long learning assignment forced students to consider both PSLOs (h) and (i) in more detail than had happened in earlier graduating classes.

Actions to be taken

The geomatics faculty will continue to have students write a paper on their plans for life long learning. In addition, faculty will more closely tie the a-k PSLOs to individual class

work in course syllabi so that students more clearly understand the relationship between what they are learning in class and what the stated learning outcomes for the program are.

4.2.8 – Industrial Advisory Committee Meetings

Assessment Results

The OIT Geomatics department makes extensive use of the knowledge and expertise of our Industrial Advisory (IAC) Committee. This group is made up of representatives from private industry and governmental organizations that have an interest in the success of the OIT geomatics program and the students graduating from it. Over the course of the 2010/2011 academic year, faculty met with the IAC committee to discuss a variety of program related issues including: curriculum design, funding issues, staffing issues, scholarships, and student internships. The IAC committee met with faculty in September, January, and May of this year.

During the 2009/2010 academic year, the IAC committee expressed concern with student satisfaction regarding the sequence of legal courses (GME 241, GME 242, GME 343, and GME 466). Faculty indicated to IAC members that the issues that most likely led to complaints from the students regarding satisfaction with the legal sequence stemmed not from course content, but from course instruction. During the 2009/2010 year, a new instructor began teaching the legal sequence of courses. IAC members did not bring forward any new complaints regarding instruction of the legal sequence during the 2010/2011 year meetings. Review of the 2010/2011 Fundamentals of Surveying (FS) exam results also show that OIT geomatics students are scoring at or above the national average in the category of boundary and cadastral law.

Actions to be taken

At this time no additional action will be taken on the items listed above. Geomatics faculty will continue to monitor student satisfaction with the legal sequence and will also continue to monitor student performance on the FLS exam category of boundary and cadastral law.

5. Evidence of Student Learning

5.1 Summary of Department Discussions on Assessment Activities

Geomatics faculty met during the start of fall quarter, 2010 to plan assessment activities for the upcoming year and to assign assessment tasks to individual instructors. Faculty met again at the end of spring quarter, 2011 discussed the results of the year's assessment activities. All assessment meetings were attended by faculty from both the survey option and the GIS option.

5.2 Summary of Faculty Decisions on Program Improvements

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

1. PSLO(a)/ISLO(6) was assessed in the GME 451 (Geodesy) course during fall quarter of 2010. The PSLO of "Understanding computed results and/or theoretical concepts" had a score of only 60%. This same PSLO was evaluated in 2008/2009 with a score of 74%. The course instructor felt that the test question that was used to assess this PLSO was poorly worded and that the low score of 60% was more a result of this factor than poor student performance. This question will be re-evaluated during fall quarter of the 2011/2012 year to determine if there is an issue of understanding by the students or if the test question was poorly worded.
2. PSLO(b) was assessed in GME 351 (Construction and Engineering Surveying) during spring quarter of 2011. While the criteria of "Professional Finished Drawings" exceeded 70% minimum (a score of 79% was obtained), the instructor felt that this was still not as high as it should be given the students were provided with checklists as to what the final drawings should contain and an example drawing to use for reference. In next years teaching of this course, students will be encouraged to take more care preparing their drawings. A mandatory peer review of the drawing set will be included in the grade points for the course to insure that students spend more time reviewing and editing the drawings prior to turning them in. This item will be re-assessed during spring quarter of 2012.
3. PSLO(i)/ISLO(5) was assessed in GME 372 (Boundary Surveying) by having the students in that course write a paper about their plans for continuing education after graduation from OIT. In the area of "…understanding the need for lifelong learning", only 38% of the students had a satisfactory performance or better. This is significantly below the departmentally required score of 70%. Student understanding of the need for lifelong learning will be re-evaluated during fall quarter of 2011. At this time, it is not known if the students will be asked to write a paper as they did during the 2010/2011 assessment, or if another assessment method will be used.
4. The senior exit survey continues to have some respondents to the question on how well they were prepared for the a-k PSLO answer that they were only "somewhat prepared". While the number responding as being only "somewhat prepared" dropped from 11% during the 2009/2010 assessment cycle to 9% during this assessment cycle, GME faculty would like to see all response as "Prepared" or "Highly Prepared." To attain this, faculty will continue to place statements regarding program learning outcomes on course syllabi and build student awareness of the learning outcomes within the student body. The senior exit survey will be administered again next year and performance in this area will be re-evaluated at that time.

6. "Closing the Loop" – Changes Resulting from Assessment

The following is a summary of areas that were identified in the 2009/2010 assessment report as being deficient and in need of improvement. With each item is a brief discussion of what was done during the 2010/2011 assessment cycle to improve assessment scores.

1. PSLO (h) was assessed in GME 466 during Winter Quarter, 2010. In this assessment, it was determined that the student's ability to "Evaluate historical approaches" to a problem solution fell below the department goal of 70%. It was determined that the most likely reason for this was not student weakness in this area, but poor design of the assignment for measuring the PSLO. Faculty proposed to re-design the assignment and re-assess the student's knowledge based on this new assignment. Due to an oversight by the assessment coordinator, this outcome was not re-evaluated during the 2010/2011 year. It will be placed on the list of items to be re-evaluated during the 2011/2012 year.
2. The probability and statistics section of the FS exam was identified as a potentially weak area. This year, additional time was spent on the introductory statistics portion of the GME 175 (Computations and Platting Course) and next year more emphasis will placed on statistics in GME 161 (Plane Surveying I). Since these are freshman level courses, no increase in performance would be expected on the FS exam until 2013. As an additional measure, to insure that students taking the test this year get the information they need, additional probability and statistics were added to the review course for students taking the FS exam. The results for the October 2010 exam and the April 2011 exam show students performing at or above the national average. Faculty will continue to monitor student performance in this area until the 2013 exam cycle in order to verify that changes in the freshman sequence are providing the expected results.
3. The final area of concern from the 2009/2010 assessment cycle was student satisfaction with the legal sequence of courses. Last year, a new instructor began teaching this sequence, and this year was his second year with the same sequence. Review of comments from the senior exit survey and IAC members indicates that this problem has been resolved by changing the instructor. There have been no further student complaints regarding the legal sequence of courses. Geomatics will continue to monitor this sequence through the next assessment cycle to insure that the problem has been resolved.

7. References

1. Oregon Institute of Technology. Institutional Research Home Page. June 9, 2011 <http://www.oit.edu/ir>

8. Appendices

Appendix A – SLO Curriculum Maps

PSLO Curriculum Map
2010/2011
PSLO (a)

PSLO (a): Student will demonstrate an ability to apply knowledge of mathematics, science, and applied sciences

Shaded courses indicate that the PSLO is taught in the course and that students are evaluated on the outcome.

	Freshman		Sophomore		Junior		Senior	
Fall	GME 161		GME 163		GME 343		GME 425	
	WRI 121		GME 241				GME 451	
Winter	CIV 112		GME 242		GME 466		GME 434	
	GME 175		GME 264		GME/GIS Elective		GME 452	
							GME 454	
Spring	GME 134		GME 372		GME 351		CIV 221	
	GME 162				GME 444		GME 468	

PSLO Curriculum Map
2010/2011
PSLO (b)

PSLO (b): Student will demonstrate an ability to design and conduct experiments, as well as to analyze and interpret data.

Shaded courses indicate that the PSLO is taught in the course and that students are evaluated on the outcome.

	Freshman		Sophomore		Junior		Senior	
Fall	GME 161		GME 163		GME 343		GME 425	
	WRI 121		GME 241				GME 451	
Winter	CIV 112		GME 242		GME 466		GME 434	
	GME 175		GME 264		GME/GIS Elective		GME 452	
							GME 454	
Spring	GME 134		GME 372		GME 351		CIV 221	
	GME 162				GME 444		GME 468	

PSLO Curriculum Map
2010/2011
PSLO (e)

PSLO (e): Student will demonstrate an ability to identify and solve applied science problems.

Shaded courses indicate that the PSLO is taught in the course and that students are evaluated on the outcome.

	Freshman		Sophomore		Junior		Senior	
Fall	GME 161		GME 163		GME 343		GME 425	
	WRI 121		GME 241				GME 451	
Winter	CIV 112		GME 242		GME 466		GME 434	
	GME 175		GME 264		GME/GIS Elective		GME 452	
							GME 454	
Spring	GME 134		GME 372		GME 351		CIV 221	
	GME 162				GME 444		GME 468	

PSLO Curriculum Map
2010/2011
PSLO (g)

PSLO (g): Student will demonstrate an ability to communicate effectively

Shaded courses indicate that the PSLO is taught in the course and that students are evaluated on the outcome.

	Freshman		Sophomore		Junior		Senior	
Fall	GME 161		GME 163		GME 343		GME 425	
	WRI 121		GME 241				GME 451	
Winter	CIV 112		GME 242		GME 466		GME 434	
	GME 175		GME 264		GME/GIS Elective		GME 452	
							GME 454	
Spring	GME 134		GME 372		GME 351		CIV 221	
	GME 162				GME 444		GME 468	

PSLO Curriculum Map
2010/2011
PSLO (i)

PSLO (i): a recognition of the need for, and an ability to engage in life-long learning.

Shaded courses indicate that the PSLO is taught in the course and that students are evaluated on the outcome.

	Freshman		Sophomore		Junior		Senior	
Fall	GME 161		GME 163		GME 343		GME 425	
	WRI 121		GME 241				GME 451	
Winter	CIV 112		GME 242		GME 466		GME 434	
	GME 175		GME 264		GME/GIS Elective		GME 452	
							GME 454	
Spring	GME 134		GME 372		GME 351		CIV 221	
	GME 162				GME 444		GME 468	