

# GEOMATICS DEPARTMENT SURVEY OPTION Oregon Institute of Technology NWCCU Assessment Report 2009/2010

## 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

Geomatics enrollment for the last 5 years is listed below. It was gratifying to see a 56.5% increase in program enrollment over last five years.

Fall Terms	Year (2005-6)	Year (2006-07)	Year (2007-08)	Year (2008-09)	Year (2009-10)
Full-time Students	46	46	65	67	72

**Table 1.1 – Geomatics enrollment trends**

### 1.3 Retention Rates

The OIT Institutional Research Office tracks full-time new and transfer students who are retained one year later. In addition, the office provides information on new students who are retained by the institution, but who have changed majors. The most recent available data is summarized below.

Fall Terms	Year (2004-05)	Year (2005-06)	Year (2006-07)	Year (2007-08)	Year (2008-09)
First-time Students	0 (0%) (n=1)	5 (55.6%) (n=9)	6 (100%) (n=6)	2 (40%) (n=5)	
First-time Students: Changed major	0	2	0	0	
Full-Time New Transfers	6 (86%) (n=7)	7(100%) (n=7)	3 (75%) (n=4)	TBD	TBD

**Table 1.2 – Geomatics Retention Rates**

**1.4 Recent Number of Graduates**

A summary of the number of geomatics degrees (now the Surveying and GIS options) 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 not notified of exam results until July or August. The long delay resulted in many individuals neglecting to report whether they passed. NCEES is now providing 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 attempt to contact graduates and assist Career Services to obtain significant placement and salary data for graduates. With only three graduates reporting, the 2008 employment rate was 100%, with an average starting salary of \$56,667, and a high of \$60,000. 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 tend to be in the range of \$45,000 to \$65,000.

## **2. Program summary**

### **2.1 Summary of Department/Industrial Advisory Committee Discussions**

At the September 18, 2009 Geomatics Industrial Advisory Committee (IAC) meeting, assessment discussion focused on the pass rates for OIT students taking the Fundamentals of Land Surveying Exam (FLS) and the Professional exam (PLS). It was noted that over the last two years, the pass rate for the FLS was 100% and that the pass rate for the PLS was only 60%. Discussion focused on what might be done to better assist students in carrying their study habits through the four years of work required before sitting for the PLS and how OIT might assist alumni with preparation for the exam (ie. Online review courses).

### **2.2 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 2009 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.

### **2.3 Survey Option Student Learning Opportunities**

Geomatics student professional learning opportunities include:

- 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.
- Professional Land Surveyors of Oregon (PLSO) annual conference. Students volunteer as runners to assist with conference details, attend technical paper presentations, and staff the OIT Geomatics department booth.
- 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 fall quarter, GME 499 Geomatics Practicum was offered for students graduating in March. These students assisted with completion of a BLM cadastral survey, precise deformation monitoring of Ponderosa Junior High School, and planning for use of ODOT RTN GPS network to map City of Klamath Falls fire hydrants. During the academic year, a massive terrestrial, GPS, and hydrographic survey of the Lakeshore drive was completed. Students in GME 343 Boundary Surveys and GME 468 completed a cadastral survey under BLM authority.
- 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 Winter	
(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	Winter Spring		
(e) an ability to identify and solve applied science problems	-		Fall	
(f) an understanding of professional and ethical responsibility	3	Fall		
(g) an ability to communicate effectively	1			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			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 2009/2010 PSLO/ISLOs.

Table 4.1 summarizes the PSLO/ISLOs that will be assessed during the 2009/2010 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.

<b>PSLO</b>	<b>ISLO</b>	<b>Course</b>	<b>Faculty</b>	<b>Term</b>	<b>Method</b>
(d) an ability to function on multi-disciplinary teams	2	GME 454 GME 468	Marker Staff	Winter Spring	Peer Evaluation Faculty Evaluation
(f) an understanding of professional and ethical responsibility	3	GME 343	Duryea	Fall	Homework Assignment
(h) the broad education necessary to understand the impact of solutions in a global and societal context	8	GME 466	Duryea	Winter	Research Paper
(k) an ability to use the techniques, skills, and modern scientific and technical tools necessary for professional practice	7	GME 372 GME 454	Marker Marker	Spring Winter	Project Evaluation Project Evaluation

**Table 4.1 – PSLO/ISLO to be evaluated during the 2009/2010 academic year**

## **4.2 Summaries of individual assessment activities**

### **4.2.1 Teamwork - PSLO (d) / ISLO (2) – “Students will demonstrate an ability to function on multi-disciplinary teams”**

Performance Criteria: The student will

1. Work with a group to achieve a specified goal.
2. Assume roles and responsibilities within the group.
3. Interact appropriately with group members.
4. Reconcile differences with group members when conflicts arise.
5. Share work among group members.
6. Develop strategies and actions to complete assigned tasks.

Student’s ability to work in teams was assessed in the Survey Option curriculum twice during the 2009/2010 academic year. The assessment was done in the GME 454 – GNSS Applications course and in the GME 468 – Senior Practicum course. The goal of the assessment was to determine how well students could interact with their group, distribute tasks across the group appropriately, and resolve conflicts within the group when and if such conflicts occurred. The teams were scored utilizing the OIT Team and Group Work Rubric which includes both student evaluation of the group’s effectiveness and instructor feedback. GME 454 was selected as a course because the groups were lab groups with specific tasks and schedules dictated to them. This setting allowed the instructor to re-emphasize material from their SPE 321 (Small Group and Team Communications) course and evaluate the student’s group performance under the more controlled environment one would expect of entry level workers. The evaluation of students in the GME 468 course utilized the same rubric, but allowed the evaluation of student group performance under the more open framework of a management position. In this course, students were expected to define goals from a general problem, develop a work schedule, and address

group issues with less guidance and support than they received in GME 454. The results of these assessments are summarized in tables 4.2, 4.3, 4.4, and 4.5 below.

**Direct Assessment by Faculty**

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Achieves goal/purpose	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	100%
Assumes roles & responsibilities	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	80%
Interacts appropriately	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	80%
Reconciles differences	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	80%
Shares work appropriately	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	80%
Develops strategies/actions	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	80%
3 or 4 on all criteria	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	80%

**Table 4.2 – Instructor rating of teams for SLO (d), GME 454, Winter 2010**

**Indirect Assessment: Students rating their teams.**

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Achieves goal/purpose	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	100%
Assumes roles & responsibilities	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	93%
Interacts appropriately	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	81%
Reconciles differences	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	88%
Shares work appropriately	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	81%
Develops strategies/actions	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	75%
3 or 4 on all criteria	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	38%

**Table 4.3 – Students rating their teams for SLO (d), GME 454, Winter 2010**

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Achieves goal/purpose	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	100%
Assumes roles & responsibilities	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	80%
Interacts appropriately	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	80%
Reconciles differences	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	100%
Shares work appropriately	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	60%
Develops strategies/actions	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	100%
3 or 4 on all criteria	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	50%

**Table 4.4 – Instructor rating of teams for SLO (d), GME 468, Spring 2010**

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Achieves goal/purpose	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	89%
Assumes roles & responsibilities	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	89%
Interacts appropriately	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	89%
Reconciles differences	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	89%
Shares work appropriately	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	78%
Develops strategies/actions	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	89%
3 or 4 on all criteria	Rubric-scored team project	1 to 4 scale	70% score at 3 or 4	44%

**Table 4.5 – Student rating of teams for SLO (d), GME 468, Spring 2010**

## **Assessment Results**

Only one area was found to be deficient in both assessments. In the GME 468 course, the instructor evaluation of appropriate sharing of work was only 60%. This deficiency is most likely the result of the very strong personalities that made up the graduating class of 2009/2010. This deficiency did not show up in the GME 454 assessment because the work assignments within the team were assigned by the instructor where the team had to work out the assignments in GME 468 for themselves.

## **Actions to be Taken**

At this time, no formal action will be taken regarding team work. However, GME instructors will be more mindful of individual personalities within the group and try to remind individuals for the necessity for sharing responsibility within a team.

### **4.2.2 Ethics - PSLO (f) / ISLO (3) – “The student will demonstrate an understanding of professional and ethical responsibility”**

Performance Criteria: The student will

1. Be able to evaluate the ethical issues related to a problem in the discipline
2. Demonstrate knowledge of the professional code of ethics in their discipline. In particular, the student will be able to identify and utilize OAR 820-020-0005 through OAR 820-020-0045 to address issues of professional conduct.
3. Student understands consequences and possible legal actions that may be taken against them under OAR 820 and ORS 672.

### **Fall Quarter 2009 PSLO (f) / ISLO (3) Assessment in GME 343**

PSLO (f) / ISLO (3) “...an understanding of professional and ethical responsibility” was assessed in GME 343 – Boundary Surveying fall quarter of 2009. The assessment consisted of a homework assignment that required the student to read Oregon Administrative Rule 820-020-Rules of Professional Conduct for Engineers and Land Surveyors and then answer short questions concerning the content of OAR 820. The student was then presented with a likely scenario from professional practice and then asked to frame a response to the scenario using OAR 820 as a guide. The responses to the questions on the homework assignment were scored from (1) Limited or no proficiency to (4) High Proficiency. The results of the assessment are summarized in the Table 4.6 below.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Provisions	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	94.1%
Issues	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	100%
Parties involved	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	94.1%
Approaches	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	88.2%
Benefits/risks	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	94.1%

**Table 4.6 -Assessment Results for PSLO f (ISLO 3), GME 343, Fall 2009**

### **Assessment Results**

The department goal for this assessment was to achieve a minimum of 70% of the students scoring a “3” or higher on all performance criteria. This goal was met.

### **Actions to be Taken**

As this is the first assessment of this particular exercise in GME 343 and the results were significantly above the departmentally established floor, no formal action will be taken at this time.

### **Spring Quarter 2010 PSLO(f) / ISLO(3) Assessment of GME Seniors**

Performance criteria: The student will

1. Demonstrate professional behavior in the academic environment.

The faculty rated the professionalism of graduating seniors using the institutional professionalism criteria shown below in Table 4.7 below. For the assessment, GME department faculty met and reviewed each student based on the items shown in Table 4.7. The faculty collectively agreed on a score for each individual.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Timeliness of work	Faculty Rating	0-2 scale	80% at 1 or 2	82%
Quality of work (course expectations)	Faculty Rating	0-2 scale	80% at 1 or 2	82%
Quality of work (work product)	Faculty Rating	0-2 scale	80% at 1 or 2	91%
Attitude toward feedback	Faculty Rating	0-2 scale	80% at 1 or 2	91%
Attitude toward assigned tasks	Faculty Rating	0-2 scale	80% at 1 or 2	82%
Punctuality	Faculty Rating	0-2 scale	80% at 1 or 2	91%
Attendance	Faculty Rating	0-2 scale	80% at 1 or 2	91%
Academic Integrity	Faculty Rating	0-2 scale	80% at 1 or 2	100%
Interpersonal skills	Faculty Rating	0-2 scale	80% at 1 or 2	91%
Knowledge of classroom policies and procedures	Faculty Rating	0-2 scale	80% at 1 or 2	100%
Work ethic	Faculty Rating	0-2 scale	80% at 1 or 2	91%
Appearance	Faculty Rating	0-2 scale	80% at 1 or 2	100%

**Table 4.7 – Assessment results for PSLO(f) / ISLO (3) – Faculty review of Seniors**

### **Assessment Results**

The department and institutional minimum for this assessment is 80%. All categories met the minimum 80% requirement.

### **Actions to be Taken**

As all areas of this assessment met the minimum requirements, no formal action will be taken at this time.

### **4.2.3 PLSO (h) The broad education necessary to understand the impact of solutions in a global and societal context**

Performance Criteria: The student will

1. Analyze a project and be able to identify all of the stakeholders in the project.
2. Analyze a project and be able to identify potential impacts to the stakeholders.
3. Be able to propose alternatives to the project design to mitigate impacts to various stakeholders.

**Winter Quarter 2010 PSLO (h) Assessment**

Winter Quarter, 2010 PSLO (h) "...the broad education necessary to understand the impact of solutions in a global and societal context..." was assessed in GME 466 – Boundary Law II. The assessment consisted of the evaluation of a research paper where the student was asked to identify a contemporary problem in boundary law, discuss the problem, and identify solutions to the problem and how these solutions might impact stakeholders. The paper was graded using a rubric that identified key areas of understanding. The scores ranged from (1) Limited or no proficiency to (4) high Proficiency. The results of the assessment are summarized in Table 4.8 below.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Identify Stakeholders	Rubric-scored paper	1 to 4 scale	70% score at 3 or 4	77%
Impact of Solution	Rubric-scored paper	1 to 4 scale	70% score at 3 or 4	77%
Evaluation of Alternative Solutions	Rubric-scored paper	1 to 4 scale	70% score at 3 or 4	77%
Evaluation of Historical Approaches	Rubric-scored paper	1 to 4 scale	70% score at 3 or 4	67%
3 or 4 on all Criteria	Rubric-scored paper	1 to 4 scale	70% score at 3 or 4	67%

**Table 4.8 - Assessment Results for PSLO (h), GME 466, Winter 2010**

**Assessment Results**

The department goal for this assessment is to have a minimum of 70% of the students score a “3” or higher on all performance criteria. This goal was met on three of the five evaluated indices and not met by two of the five.

**Actions to be Taken**

This assignment and the scores will be reviewed in a faculty assessment meeting to assess possible actions for this item. In this particular assessment, the most likely cause of the

low scores is the result of miscommunication of assignment criteria and expectations from the Assessment Coordinator to the new faculty member who administered the assessment for the first time. Further refinement of the research paper requirements in relation to the evaluation rubric will most likely enhance student performance the next time this PSLO is assessed.

**4.2.4 PLSO (k) The ability to use the techniques, skills, and modern scientific and technical tools necessary for professional practice.**

**Winter Quarter 2010 PSLO (k) Assessment**

Performance Criteria for GME 454: The student will

1. Design a static GPS control network that meets instructor designated specifications.
2. Collect GPS observations in the field that meet the designated standards.
3. Process and analyze observations to insure results meet specifications.
4. Prepare a final report that summarizes network design, observation issues, and final results.

**Winter Quarter, 2010 PSLO (k) “...an ability to use the techniques, skills, and modern scientific and technical tools necessary for professional practice...”** was assessed in GME 454 - GNSS Applications. The assessment consisted of the evaluation of two lab exercises. Students were required to design a GPS network and perform a field survey utilizing their design. The project was evaluated using a rubric designed to assess the student’s proficiency in four key areas. The results of the assessment are summarized in Table 4.9 below.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Design	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	100%
Observations	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	100%
Analysis	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	95%
Report	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	90%

**Table 4.9 - Assessment Results for PSLO (k), GME 454, Winter 2010**

**Spring Quarter 2010 PLSO (k) Assessment**

Performance Criteria for GME 372: The student will

1. Design a subdivision utilizing the standards outlined in the Oregon Revised Statutes and Klamath County Land Development Code.
2. Utilize assigned software package to develop a graphic drawing of the subdivision and the requisite COGO calculations.
3. Produce a project notebook that documents the steps in the development of their subdivision.
4. Create a final plat map that meets all state and local requirements for filing with the Klamath County Surveyor and the Klamath County Clerk.

**Spring Quarter, 2010 PLSO (k) “...an ability to use the techniques, skills, and modern scientific and technical tools necessary for professional practice...”** was assessed in GME 372 – Subdivision Planning and Platting. The assessment consisted of the evaluation of the courses quarter long lab project of developing a subdivision to Klamath County Standards. The project was evaluated using a rubric designed to assess the student’s proficiency in four key areas. The results of the assessment are summarized in Table 4.10 below.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Design	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	100%
Observations	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	100%
Analysis	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	95%
Report	Rubric-scored assignment	1 to 4 scale	70% score at 3 or 4	90%

**Table 4.10 - Assessment Results for PSLO (k), GME 372, Spring 2010**

**Assessment Results**

The department goal for this assessment is to have a minimum of 70% of the students score a “3” or higher on all performance criteria. This goal was exceeded in all categories.

**Actions to be Taken**

As this is the first assessment of this particular exercise in GME 454 and the results were significantly above the departmentally established floor, no formal action will be taken at this time.

#### 4.2.5 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 (FLS) exam given by the State of Oregon. Students may take the exam in either October or April, depending on their graduation date. Our students 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 FLS ensures that those entering the profession meet preliminary knowledge requirements for becoming a professional. The results for the October and April 2009 exams are summarized in the Table 4.11 below.

<b>Exam Date</b>	<b>Pass Rate</b>
April 2009	100%
October 2009	100%

**Table 4.11 – FLS Exam pass rates for April and October 2009**

#### Assessment Results

The pass rate for OIT Geomatics students was 100% for both exams. 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 years test results and our students continue to score below the national average.

#### Actions to be Taken

Recognizing this deficiency, GME Faculty introduced more introductory probability and statistics in the GME 175 (Computations and Platting) course. When the FLS scores were reviewed by the faculty, it was also decided to add greater emphasis to probability and statistics in the GME 161 (Plane Surveying I) course work. The results of this will not show up until the 2013 FLS test cycle, so a temporary measure will be required for students who are currently starting their senior year. This will require GME faculty to offer extra review courses in probability and statistics prior to seniors taking the exam in the next two assessment cycle.

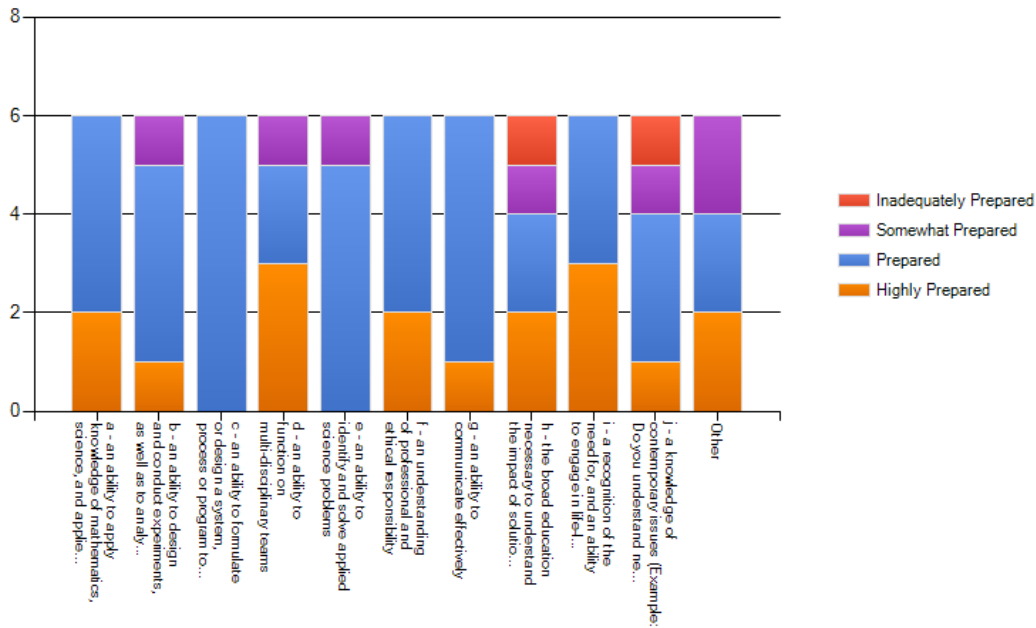
#### 4.2.6 – Senior Exit Survey

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 with through the Survey Monkey website.

Performance Criteria: The student will

1. Feel that they are prepared or highly prepared in PSLO a-k recognized by the geomatics department.

This question is for Survey Option students only. Please indicate how well the program has prepared you with regard to the following program learning outcomes. These learning outcomes represent areas that ABET wants to ensure that students in all engineering and applied science disciplines are comfortable with on graduation from an accredited program. Please indicate how well prepared you feel in each area.



**Table 4.12 – Results of Senior Exit Survey concerning preparedness for Program Student Learning Outcomes (a-k)**

### Assessment Results

Examination of the table above shows that some students felt that they were only “Somewhat prepared” or “Inadequately Prepared” on items b, d, e, h, i, and j. This falls below the departmentally established goal for this item

### Actions Taken

On this survey, only one student responded that they felt “Somewhat Prepared” or “Inadequately Prepared” to the items in Table 4.12 above. To address this issue, the GME faculty decided to continue monitoring senior exit surveys over the course of the next year to see if this one time event becomes a pattern. In addition to continued monitoring, a new module for the GME 161 (Plane Surveying I) course is being instituted that will describe for the student both program expectations and professional expectations

so that students have a more clear idea of what they are trying to achieve at the beginning of their studies.

#### **4.2.7 – Industrial Advisory Committee Meetings**

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 2009/2010 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.

Most issues discussed at the IAC meetings do not bear directly on program assessment. However, in the May meeting an issue of particular concern was brought forward. Some members indicated that they had feedback from students indicating that they did not feel the program was meeting their expectations. Since the conversations that the IAC members had with students were private, specifics were not available to the GME faculty. While specifics were not available, it appeared that a general complaint was the quality of instruction in the sequence of legal courses (GME 241, GME 242, GME 343, and GME 466). Since the geomatics faculty takes student satisfaction with the program to be a top priority, much discussion followed the May IAC meeting concerning this topic. After careful review of other assessment materials the following conclusions were reached. First, faculty recognized students had a valid concern regarding instructional quality in the legal sequence of courses. In particular, the faculty member that taught the sequence had difficulty connecting with the students and this was a known issue with the student body. The faculty member in question has since left the institution and has been replaced with a new faculty member. At this time, it is too early to tell how much this will improve student satisfaction in the legal sequence, but the instructor's performance will be carefully monitored through the coming academic year.

While student satisfaction with instructors is important, it was also important to determine if students are missing material. IAC members indicated that they were concerned that if students were not satisfied with their educational experience, they may also not be getting the material that they need to be successful in their profession. Careful review of the FLS Exam results for the 2009 exams indicated that despite being dissatisfied with the instruction, students were getting the material that they needed. On the April 2009 exam, the institutional average on questions in the legal section was 5 percentage points below the national average and on the October 2009 exam, 11 percentage points above the national average. This indicates that while students were dissatisfied with the instruction, they were still getting the information required to be successful.

At this point, it seems that the issue of student satisfaction is addressed. Given that student satisfaction with the program is of paramount importance to the GME faculty,

this issue will continue to be monitored. We will continue to solicit feedback from IAC members and students regarding this issue and we will continue to monitor the scores that students are obtaining on the legal section of the FLS Exam. It is hoped that the new faculty member who is now teaching the legal sequence of courses will be able to increase student satisfaction in this area.

## **5. Evidence of Student Learning**

### **5.1 Summary of Department Discussions on Assessment Activities**

Geomatics faculty met at the beginning of each quarter during the 2009-2010 academic year to plan assessment activities and discuss assessment results from the previous quarter. All department discussions included 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 (h) was assessed in GME 466 during Winter Quarter, 2010. In this assessment, it was determined that the students 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. The assessment will be redesigned and administered again next year. Faculty think that this will demonstrate that students are competent in this area when they clearly understand the assigned task.
2. The probability and statistics section of the FLS 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 Plotting Course) and next year more emphasis will be placed on statistics in GME 161 (Plane Surveying I). When the April 2010 FLS exam results are available in the Fall of 2010, they will be reviewed to see if scores in this area remain low. If so, additional study sessions will be provided to students preparing for the FLS exam in order to help correct this deficiency. GME faculty will also compare the material on the exam to that being taught in statistics courses at OIT to determine if there is a gap between expectations on the professional exam and the material being taught in OIT Statistics courses.
3. IAC members brought to the GME faculty concern with student satisfaction in the legal sequence of courses. A new faculty member is currently teaching this sequence and the issue will be monitored through the 2010/2011 academic year. Senior exit surveys and continued feedback from IAC members will be used to monitor progress in this area.

## **6. “Closing the Loop” – Changes Resulting from Assessment**

The question category of probability and statistics was identified as a possible weakness on the FS exam last year. Additional material on statistics was added to the GME 175 course in response. The scores on probability and statistics were also low on the 2009 exams so it is evident that this is an area of weakness. For next year, probability and statistics will receive additional coverage in GME 161. If the results of the 2010 FS exam (results available in fall 2010) again show this to be a weakness, GME faculty will compare the statistics questions found on the FS exam with the material taught in the required statistics courses at OIT. A supplemental review course will also be instituted for students preparing to take the FS exam in effort to help them improve their scores.

## **7. References**

Oregon Institute of Technology. Institutional Research Home Page. December 18, 2009  
<<http://www.oit.edu/ir>>

## **8. Appendices**

### **Appendix A – SLO Curriculum Maps**

**Appendix A**  
**2010 SLO Curriculum Maps**

**PSLO Curriculum Map**  
**2009/2010**  
**PSLO (d)**

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

**PSLO (d): Student will demonstrate an ability to function on multi-disciplinary teams**

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

**Appendix A**  
**Geomatics – Survey Option**  
**PSLO Curriculum Map**  
**2009/2010**  
**PSLO (f)**

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

**PSLO (f): Student will demonstrate an understanding of professional and ethical responsibility.**

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

**Appendix A**  
**Geomatics – Survey Option**  
**PSLO Curriculum Map**  
**2009/2010**

	Freshman	Sophomore	Junior	Senior
<b>Fall</b>	GME 161	GME 163	GME 343	GME 425
	WRI 121	GME 241	WRI 327	GME 451
	SPE 111			
<b>Winter</b>	CIV 112	GME 242	GME 466	GME 434
	GME 175	GME 264	GME/GIS Elective	GME 452
	WRI 122	WRI 227	SPE 321	GME 454
<b>Spring</b>	GME 134	GME 372	GME 351	CIV 221
	GME 162		GME 444	GME 468

**PSLO (h)**

**PSLO (h): Student will demonstrate the broad education necessary to understand the impact of solutions in a global and societal context.**

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