New Programs Follow-up Report

Institution Submitting Request: Utah Valley University
Program Title: Bachelor of Science in Geomatics and Associate in Science in Geomatics
School or Division or Location: College of Technology and Computing
Department(s) or Area(s) Location: Engineering Graphics and Design Technology
Recommended Classification of Instructional Programs (CIP) Code[1]: 15.1102
Board of Regents' Approval Date: 12/09/2010

Proposal Type (check all that apply):

Regents' General Consent Calendar Items		
R401-5 OCHE Review and Recommendation; Approval on General Consent Calendar		
SECTION NO.		ITEM
5.6.1	X	Three-Year Follow-Up Report of Recently Approved Programs
5.6.2	☐	Two-Year Follow-Up Report of Fast Tracked Certificate

Chief Academic Officer (or Designee) Signature:
I certify that all required institutional approvals have been obtained prior to submitting this request to the Office of the Commissioner.

_____
Signature Date: 8/26/2014

Printed Name: *Jeffery Olson*

[1] CIP codes must be recommended by the submitting institution. For CIP code classifications, please see http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55.

Third-Year Report
Utah Valley University
Bachelor of Science, Associate in Science in Geomatics
03/31/2014

Program Description

On December 9, 2010 the Utah State Board of Regents approved the Geomatics Program at Utah Valley University, which includes a Bachelor of Science and an Associate in Science degree. Courses began Fall 2011.

Geomatics is the study of geospatial measurement and representation including such disciplines as land surveying, photogrammetry, remote sensing (satellite imaging and laser scanning), geographic information systems (GIS), cartography, global positioning systems (GPS), and some parts of geography and civil engineering.

Geomatics is a discipline which integrates acquisition, modeling, analysis, and management of geo-spatial reference data. Based on the scientific framework of geodesy, terrestrial, marine, airborne, satellite-based sensors, and measurement systems and technologies are used to acquire spatial and other data. The Land Surveying component of Geomatics includes investigation, analysis, application of boundary/property laws, and legal principles pertaining to specific public and private properties, and is a regulated profession wherein a license to practice land surveying is issued by each state in an effort to protect the public and private interests in property boundaries.

Students in the Geomatics Program may earn an Associate in Science in Geomatics, which will help them be immediately employable as entry level surveyor GIS technician. Students may also earn a Bachelor of Science in Geomatics, which will prepare them to successfully pass the national Fundamentals of Surveying (FS) exam which is a significant step towards surveying licensure. The bachelor degree program has been developed around four core disciplines, which build on an in-depth foundation of knowledge needed for the professional practice of surveying and GIS. Geomatics program goals are to secure ABET/ASAC accreditation by Fall 2017 and to continue to encourage student interest in obtaining graduate degrees in the field of Geomatics from other nationally ranked institutions. The program is operating under an annual cohort system starting in Fall semester of each year, so matriculation is required to ensure that each perspective student completes all required course prerequisites prior to entrance into a cohort.

Enrollment and Revenue Data

	Prior to Program Implementation	Year 1 (2011-12)		Year 2 (2012-13)		Year 3 (2013-14)	
Departmental/Unit Enrollment and Staffing Data		Est.	Actual	Est.	Actual	Est.	Actual
Total Department Student FTE	473	477.50	469	485.17	487	513.13	439

(Based on Fall Third Week Data)							
Total Department Faculty FTE (A-1/S-11/Cost Study Definition)	10.2	0	12.8	0	12.8	0	19.2
Student FTE per Faculty FTE (from Faculty FTE and Student FTE above)	46.37	8.65	36.64	11.59	38.05	12.54	22.86
Program Level Data							
Total Number of Declared Majors in Program	X	15	15	35	26	62	29
Total Number of Program Graduates	X		n/a		4		n/a
Departmental Revenue		Est.	Actual	Est.	Actual	Est.	Actual
Total Revenue to Department (Total of Funding Categories from R401 Budget Projection Table)	$1,324,107	$1,337,172	$1,217,303	$1,414,392	$1,318,401	$1,575,749	n/a
Departmental Instructional Cost per Student Credit Hour (per Institutional Cost Study Definition)	n/a	X	269.13	X	250.93	X	n/a

Institutional Analysis of Program to Date

Enrollment Strengths and Weaknesses

The Geomatics Program started with 15 declared majors beginning Fall 2011, and as of Spring semester 2014 there are over 65 majors with 29 currently enrolled in Geomatics specific courses. As can be observed by the table above, the projected enrollment numbers exceed the actual values by a little more than double by the third year. When these projections were made we anticipated that the Utah State Legislature would revise the educational component of the professional licensing law to a four-year degree from the current two-year degree requirement. This never occurred and may not be likely in the next four to five years for a number of different reasons beyond the scope of this report. As a result of these lower than

anticipated enrollments we have implemented the cohort system for the program and have taken a different marketing and recruiting approach. Essentially, this difference translates into increased marketing and recruiting efforts, which will seek a broader interest base. This altered marketing approach therefore includes focus on potential students who have interests in disciplines which are a part of the field of Geomatics such as Geographic Information Systems (GIS), Geodesy, Remote Sensing, and other related fields like information systems, digital media, civil engineering, drafting and design to mention a few. In spite of the legislative setback, the Geomatics Program continues to show steady growth as word spreads about the value of a degree in the multi-faceted discipline of Geomatics.

During the first three years of the program the enrollments in individual Geomatics specific courses averaged four students. This registration level was immediately recognized as being unacceptable even for a new program. To mitigate the impact of these low course enrollments the program coordinator made the decision to implement a cohort system beginning Fall 2014. Each Geomatics major will matriculate into the Geomatics cohort by completing all necessary cohort prerequisites prior to entry into the cohort. This allows a cohort student to attend Geomatics courses full-time and spend four semesters together with the same group of students each graduating in Spring 2016. At first the cohort was offered on a bi-annual basis, but because of demand it will now be offered annually beginning every Fall semester. There are now at least 15 matriculated students ready to begin the first cohort Fall 2014. All these students will register for the same courses. This cohort schedule change has successfully mitigated the individual course enrollment shortfalls previously experienced. We are now recruiting students for the Fall 2015 cohort and already have a few students preparing for entry. The implementation of the cohort system into the program should make a noticeable increase in the overall program enrollment.

Increased marketing and recruiting efforts are being planned or are already underway including the following:

- Professional Conference/Convention participation (presentations and speaking engagements)
- Research projects and peer reviewed articles published at state, national, and international levels
- Geomatics events hosted/sponsored by the Geomatics program (Utah Council of Land Surveyors (UCLS) Fall Forum, Club Activities, Lecture Series, etc.)
- Geomatics promotional video (completed and found on UVU YouTube® channel and our website)
- Geomatics website: www.uvu.edu/geomatics
- Advertising: newspaper articles, press releases, giveaways, and public relations events, etc. to the general UVU student body (out largest and most immediate market)
- Specifically targeting/focusing on high school charter and private schools
- Community events (i.e. TrigStar program, NSPS Surveying Competition, etc.)
- Geomatics graduates being successful with their employers
- Changing the name of the program to Geomatics Engineering or Geospatial Engineering (common in universities in the U.S.A.)

All these above listed activities and efforts have been or will be implemented, which should continue to steadily increase enrollments over the next five years.

Staffing Strengths and Weaknesses

Beginning Fall 2012 Sowmya Selvarajan joined our faculty as a full-time tenure track faculty teaching a bank of courses specific to her expertise. Her entire workload was filled with new courses that had never been taught before, which brought its own set of problems and issues which have since been resolved

having now taught every course at least once and this school year teaching those same courses for the second time. Significant improvements have been made thanks to the teaching and content expertise of Dr. Selvarajan.

There is an additional full-time tenured faculty who teaches Geomatics courses part-time and Drafting Technology courses part-time totaling a full-time load. Namely, Danial Perry who is also the Geomatics Program Coordinator. The Drafting Technology courses he teaches are also required courses for Geomatics. Another full-time tenured faculty teaches two Drafting Technology courses which are surveying specific courses but are also currently required in the Geomatics Program. As the program continues with the cohort system as planned it is anticipated that the Program Coordinator, Danial Perry will move into a full-time teaching load for Geomatics thus bringing the full-time tenured/tenured track faculty in Geomatics to two.

The Geomatics Program employs six (6) Adjunct Faculty teaching very specific and specialized content areas of Geomatics. Each of these adjuncts has extensive work experience and specialized education in the content areas in which they teach and a few are even nationally recognized as such experts. Each adjunct faculty member adds a critical and current field experience element to the program as well as contributing to the overall program breadth.

The program is currently seeking a teaching assistant for the GIS courses which will help alleviate the heavy workload of Dr. Selvarajan.

Funding Strengths and Weaknesses

Currently the primary funding for the Geomatics Program is through the PBA budget process which covers the costs of faculty salaries and benefits, adjunct instructor salaries, and general budget program demands. Course fees have been implemented for applicable courses including software, lab access, and supplies. The software tools and instruments needed to properly teach Geomatics courses have primarily been funded through a few Engineering Initiative Funds (EIF) monies and Perkins grants which assist in the lower division CTE approved courses. However, the program lacks both quantity and quality of surveying instruments and software needed for a multitude of surveying courses both upper and lower division. Some of these needs specifically enumerated are survey and map grade GPS instruments, Robotics Total Stations, 3D laser-scanners, Unmanned Aerial Systems (UAS's) with image and scanning capability, software to operate these instruments, and the software needed to manipulate the data acquired from these instruments. The program was started on very little actual funding but did receive budget line items beginning Fall 2012. The Program Coordinator is tasked with an on-going pursuit of additional soft funding and instrument partnering programs which could greatly enhance the student hands-on experience so critical to producing a quality student for the workforce.

Additional Strengths and Weaknesses

Simultaneous with the commencement of Geomatics courses, Fall 2011, a UVU Geomatics Advisory Board was formed from a very diverse group of professionals practicing surveying and mapping in both the State of Utah and on a national/federal level. Each board member contributes annually in time and money towards the academic success of the Geomatics Program. They are currently involved in and play an integral role in the full implementation of a continuous improvement program with primary focus on ABET/ASAC accreditation. This board and the Program Coordinator anticipate obtaining this accreditation by 2017. To this end the board has been tasked to reassess the original Geomatics Program mission and

objectives/outcomes for relevance, importance, and marketplace reality. The following is now the mission and outcomes of the program as recently adopted.

Mission and Purpose of the Geomatics Program:
The Geomatics Program degrees will prepare students for a profession in Geomatics on a state, regional, national, and international level in public, private, and academic settings. As a part of Geospatial sciences Geomatics students will be able to demonstrate knowledge and skills in data acquisition, modeling, analysis, integration, and management of geospatial reference data used to produce deliverables for land surveying, civil engineering, cartography, geographic information systems (GIS), geodesy, and remote sensing.

Program Learning Outcomes
1. Provide the graduate with a sufficient knowledge and understanding of Geomatics to successfully pass the National Council of Examiners for Engineering and Surveying (NCEES) Fundamentals of Surveying (FS) exam.
2. The Geomatics AS and BS degrees will provide the graduates with full-time entry level employment opportunities in Geomatics. With a jobs to graduates ratio of at least 1:1.
3. Develop and maintain an academic environment and structure which encourages students to continue pursuit of undergraduate and/or graduate degree(s) in Geomatics or directly related studies. At least 5% of Geomatics majors will graduate and go on to graduate school in Geomatics or a directly related field of study.
4. Each student will be given engaged learning opportunities in collaboration with the public or private professional community.

We have formed a Geomatics student association which sponsors the Geomatics Lecture Series addressing current topics and training. This organization contributes significantly to the esprit de corps of the Geomatics students. This association sponsors an UVU Survey Team to the annual National Society of Professional Surveyors (NSPS) national survey competition held annually somewhere in the United States. In 2013 the UVU survey team took third place and in 2014 will compete in San Diego in the hope of earning first place.

An important, though not critical element, contributing to the success of the Geomatics program could be the passage of legislation requiring a four-year degree in Geomatics/Surveying for licensure in the State of Utah. When the Utah State legislature previously passed a similar law requiring a two-year degree the enrollment at the then only surveying educational program at the time in the State (Salt Lake Community College – Surveying Technology) tripled within one year of passage. Therefore, if a similar (but four-year degree requirement) law were to be passed in Utah, it seems logical to assume the enrollment numbers would significantly increase. However, to mitigate this weakness and considering such action to be only a hope and certainly not within the control of the UVU Geomatics Program, the decision has been made to continue to seek opportunities outside of the specific area of Land Surveying for which a license is required. Geomatics currently offers many such opportunities. Marketing and recruiting efforts are and will be directed more toward job opportunities in the geospatial sciences, mapping, and specialized measurement sciences and technologies sectors of the marketplace. This should provide ample opportunities for students seeking a Geomatics degree.

Employment Information

Term Graduated	Graduate School	Employed in Field	Employed Other	Unknown
Trevor Jensen Spring 2012	None	Yes		
Nick Wardell Spring 2012	None	Yes		

The Program Coordinator has been instrumental in securing internships or employment for graduates both past and anticipated graduates for Spring 2014. Internships are critical to student employment success and each internship, thus far, has yielded either additional internships for other students or full-time employment.