

**Assessment Report  
Land Surveying Minor  
Montana State University  
2014 – 2015 Academic Year**

Department: Civil Engineering

Department Head: Jerry Stephens

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Date: Fall 2015, Reporting Period Academic Year 2014 – 2015

Program: Land Surveying Minor - offered in conjunction with  
BS Civil Engineering (CE)  
BS Civil Engineering, Bio-Resource (BREN) Option  
BS Construction Engineering Technology (CET)  
and open to all majors at MSU

**Program Objectives:**

The objective of the Civil Engineering Department's Minor in Land Surveying is to provide students with the education necessary to readily satisfy the academic requirements of the Montana Board of Professional Engineers and Professional Land Surveyors to sit for the Fundamentals of Surveying (FS) Exam. Currently, if a student desires to start on the path of becoming a Professional Land Surveyor, they must take a series of Montana Board of Professional Engineers and Professional Land Surveyors approved courses to become eligible to sit for this exam. As board members and class offerings change over time, it is difficult for students to be judged eligible by the Board to take the FS exam because of the need for a course-by-course assessment. The Montana Board of Professional Engineers and Professional Land Surveyors, the Montana Association of Registered Land Surveyors (MARLS), and the Department of Civil Engineering want to facilitate this approval process by tying it to a formal curriculum accepted by the Board as satisfying their requirements. This minor will facilitate the path to professional registration in Montana and other states, as students that successfully complete the associated coursework will have an institutionally established Surveying Minor recognized as satisfying the educational requirements to sit for the FS exam.

## Program Structure:

The Program of Study for the Land Surveying Minor developed to meet the surveying components of the requirements of the state licensing Board consists of 29 credit hours of coursework as follows:

### REQUIRED COURSES – 20 credits

SRVY 230 SURVEYING (formerly CE 201)**#	3 cr
SRVY 273 CONSTRUCTION SURVEYING AND EARTHWORK (formerly CET 202)**	3
OR ECIV 350 TRANSPORTATION ENGINEERING (formerly CE 350)#	
SRVY 355 ADVANCED SURVEYING COMPUTATIONS (formerly CE 363) ^^	3
SRVY 375 PHOTOGRAMMETRY (formerly CE 463) ^^	2
SRVY 361 LEGAL PRINCIPLES OF SURVEYING (formerly CE 361)^^	3
SRVY 362 U.S. PUBLIC LAND SURVEY SYSTEM (formerly CE 362)^^	3
SRVY 474 PROJECT DESIGN IN SURVEYING (formerly CE 464)^^	3

### ELECTIVE COURSES from the following choices - 9 Credits

ECIV 456 HIGHWAY GEOMETRIC DESIGN (formerly CE 456)^^	3
AGEC 337 AGRICULTURAL LAW	3
DDSN 245 CIVIL DRAFTING	3
GPHY 357 GPS FUNDAMENTALS & APPS IN MAPPING (formerly LRES 357)	3
GPHY 426 REMOTE SENSING AND DIGITAL IMAGE PROCESSING (formerly LRES 426)	3
LRES 457 ADVANCED GPS MAPPING FOR GIS	3
GPHY 284 INTRODUCTION TO GIS SCIENCE AND CARTOGRAPHY	3
GPHY 384 ADVANCED GIS AND SPATIAL ANALYSIS	3
GPHY 484R APPLIED GIS AND SPATIAL ANALYSIS	3

\*\* ALREADY IN CET CURRICULUM

# ALREADY IN CE/BREN CURRICULUM

^^ PROFESSIONAL ELECTIVE IN CET, CE, or BREN

## Outcomes Assessment:

The above Land Surveying Minor was approved as a curriculum acceptable to the Montana Board of Professional Engineers and Land Surveyors. With this action, the primary and direct objective of this Minor was achieved, i.e., establishment of a formal curricula available to MSU students that is recognized by the state licensing board as satisfying their academic requirements to permit pursuit of professional registration in land surveying (more specifically, to sit for the FS exam). From a program perspective, it is further desirable to assess the level demand for this minor, and the degree of success realized by students that pursue it. Therefore, the Department annually assesses the number of students that graduate with a Land Surveying Minor. Further and as possible, the progress of these students following graduation is monitored specifically

with respect to their surveying related activities. Metrics/information that are tracked as available include:

- student satisfaction with the minor, at and after graduation,
- percent of students with the minor that are employed in surveying related jobs,
- surveying employer satisfaction with students that obtained the minor,
- percent of students with the minor that take the FS exam,
- FS exam performance compared to national experience,
- percent of students with the minor that earn surveying intern status, and
- percent of students with the minor that earn professional surveying registration.

With the exception of the number of students that graduate with a Surveying Minor, the above metrics/information on student performance post-graduation are not automatically collected or necessarily available in university or other databases. Collection of this information relies significantly on the Civil Engineering Department's ability to maintain contact with this specific cohort of students after they graduate, and on their subsequent willingness to respond to this contact. The Department has had limited success in these regards.

In academic year 2014-2015, six students graduated with the Land Surveying Minor. Since the minor was adopted in 2011, 15 students have completed the program (see Table 1).

Table 1. Land Surveying Minors Awarded at MSU

Academic Year	Surveying Minors Awarded <sup>b</sup>
2010-2011 <sup>a</sup>	4
2011-2012	1
2012-2013	0
2013-2014	4
2014-2015	6

<sup>a</sup>Minor was approved in AY 2010 – 2011

<sup>b</sup>Table entries have been updated relative to the 2013-2014 assessment report to reflect better information now available on number of minors awarded. Total number of minors awarded through 2013-2014 did not change, simply the specific years when they were awarded.

No graduates from 2014 - 2015 were interviewed regarding the program. That being said, student participation in the program has been steadily increasing over the past three years, which can be interpreted as indicating some degree of their satisfaction with it. The employment status of all 15 graduates of the program to-date is unknown. Based on information available on the Montana Board of Professional Engineers and Professional Land Surveyors website, none of the

2014-2015 program graduates have become Land Surveyor Interns (in Montana) as of Fall 2015. Since its inception, four of the total of 15 program graduates have achieved the status of Land Surveyor Intern (in Montana). Three of the six graduates from 2014 – 2015 are Engineers in Training, although this credential does not directly support their eventual registration as Professional Land Surveyors. Nonetheless, a focus in land surveying, as recognized by a Land Surveying Minor, could also well support job activities and advancement in civil engineering employment.

In light of the on-the-job experience required prior to being considered for Professional Land Surveyor registration (four years), it is possible that some of the early program graduates are eligible for professional registration. However, in reviewing licensing information available on the State of Montana professional registration website, none of the program graduates to-date have become licensed Professional Land Surveyors.