

## **Current Status of Surveying in Curricula in Indiana and Illinois**

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### **Abstract**

A historical connection exists between civil engineering and surveying. Prior to surveying becoming its own discipline, civil engineering curricula included multiple classes in surveying. The author has heard stories from now retired engineers and surveyors that since the 1970s, surveying classes have been eliminated from many civil engineering degree programs. Perceptions that surveying is a trade and that tasks involved with surveying are routine may be reasons why surveying is not considered on the same level as other civil engineering sub-disciplines. Additionally, modern surveying equipment can be adequately operated by people with less technical background. ABET accreditation criteria for civil engineering and civil engineering technology programs do not specifically require surveying. Three ABET commissions have accreditation criteria for surveying related degree programs. However, no ABET surveying (or geomatics/geomatics engineering) degree programs or related degree programs exists anywhere in the states of Indiana or Illinois.

Both the Indiana State Board of Registration for Professional Surveyors and the Illinois Land Surveyors Licensing Board promulgate rules for licensure of land surveyors that require a bachelor degree in land surveying or alternatives to this requirement. Degrees in civil engineering, civil engineering technology, or construction management are not considered equivalent alternatives to a land surveying degree. Nevertheless, some curricula at institutions in Indiana and Illinois do include surveying classes.

This paper presents the results of a study of various degree programs and course offerings at institutions in Indiana and Illinois that contain surveying classes. The author conducted the survey in January and February of 2015. The purpose of this paper is to document a work in progress and the initial effort into a longer term investigation of surveying and civil engineering.

## **Background**

Civil engineering has traditionally included surveying. Civil engineers who are now retired can recall spending summers while in college participating in summer survey camps. Evidence of these summer survey camps is found as alumni and faculty reminisce about the past experiences at Purdue University<sup>1</sup>, University of Michigan<sup>2</sup>, University of Wisconsin<sup>3</sup>, and Harvard University<sup>4</sup>. A Purdue civil engineering graduate characterized the end of summer survey camps as “I suppose the ‘modern engineer’ has little use for the practicalities of field surveying and other hands-on courses like we took back in the ’50s.”<sup>1</sup> Although summer survey camps may have been eliminated, surveying classes did remain in curricula for some time longer. The author graduated from the University Of Notre Dame with a bachelor degree in civil engineering in 1990 when no surveying classes were a part of the curriculum at that time. Surveying equipment was present in laboratory facilities but it was clearly quite old and had not been used in many years.

## **Civil Engineering Curricula Review**

Curricula for various degree programs in Indiana and Illinois were reviewed to determine how many of these degree programs contained surveying classes. A particular focus on EAC-ABET

civil engineering degree programs was made in the initial effort but the study included other degree programs also. EAC represents the Engineering Accreditation Commission. There are 15 EAC-ABET civil engineering degree programs in Indiana and Illinois. The results of the study indicate that nine of these institutions require a surveying class in the curriculum. These nine institutions along with the specific surveying class are listed in Table 1.

Table 1. Institutions that require a surveying class.

Institution:	Surveying Class:
Indiana University-Purdue University Fort Wayne	CE 21000 Introduction to Geomatics
Purdue University at West Lafayette	CE 20300 (Principles and Practices of Geomatics)
Purdue University Calumet	CE 20100 Surveying & G. I. S
Rose-Hulman Institute of Technology	CE 101 Engineering Surveying
Trine University	CE 2001 Basic Surveying Laboratory CE 2003 Basic Surveying
University of Evansville	CE 183 Surveying
Illinois Institute of Technology	CAE 105 - Geodetic Science
Southern Illinois University Carbondale	CE 263 Basic Surveying
Southern Illinois University Edwardsville	CE 206 Civil Engineering Surveying

In general the surveying classes are 200-level classes and are shown in the first semester of the second year for a typical four year civil engineering curriculum plan of study. Some institutions identified the class in the second semester of the second year of study. Rose Hulman is on a quarter system and the surveying class is shown on the plan of study in the spring quarter, the last quarter of a typical academic year for a first year student. The six institutions that do not have a surveying class in their civil engineering curriculum are listed on Table 2.

Table 2. Institutions that do not require a surveying class.

Institution:
University of Notre Dame
Valparaiso University
Bradley University
Northwestern University

University of Illinois at Chicago
University of Illinois at Urbana - Champaign

### **Other Curricula Review**

Curricula for other degree programs in Indiana and Illinois were also reviewed for surveying classes. This review of programs other than EAC-ABET civil engineering degree programs was not comprehensive. Of note, two programs that have no ABET accreditation stand out from this review, a bachelor degree program in geomatics from Northern Illinois University and an associate degree program in surveying technology from Vincennes University. The Northern Illinois geomatics degree program is described as a “curriculum in Geomatics [that] includes 24 hours of course work in surveying. Together with other required courses and electives, the program meets State of Illinois requirements for taking the *surveyor in-training examination* and pursuing a career as a licensed professional land surveyor.”<sup>7</sup> The Vincennes University program information notes that the degree along “with experience, appropriate continuing education and successful completion of the state and national exam, the status of land surveyor may be achieved.”<sup>8</sup> Several other degree programs in Indiana and Illinois contain surveying classes, some degree programs contain multiple surveying classes.

Professional surveying organizations in each state of Indiana and also in Illinois identify institutions that offer surveying classes. The Indiana Society of Professional Land Surveyors (ISPLS) identifies six institutions on their website and the Illinois Professional Land Surveyors Association (IPLSA) identifies 14 institutions on their website. These include institutions located in other states. Two institutions are listed on both websites. These institutions are identified in Table 3.

Table 3. Institutions offering Surveying, surveying organization websites.

Institution:	Listed on ISPLS website	Listed on IPLSA website	State institution is located
Vincennes University	X		Indiana
Purdue University - Calumet	X	X	Indiana
Purdue University	X	X	Indiana
Cincinnati State University	X		Ohio
Ferris State University	X		Ohio
Sinclair Community College	X		Ohio
College of Lake County		X	Illinois
Ferris State University		X	Michigan
Illinois Central College		X	Illinois
John A. Logan College		X	Illinois
Lake Land College		X	Illinois
Northern Illinois University		X	Illinois
Parkland College		X	Illinois
Rend Lake College		X	Illinois
Southern Illinois University Edwardsville		X	Illinois
St. Louis Community College at Florissant Valley		X	Missouri
University of Wyoming		X	Wyoming

## **ABET**

ABET, Inc. is an organization that promulgates accreditation criteria for various degree programs. ABET has four accreditation commissions, three of which accredit degree programs that have surveying courses. The NCEES Model Law General Requirements for Licensure refer to ABET degrees as one manner of satisfying minimum qualifications to become a surveyor intern<sup>4</sup> and thus eventual licensure as a professional surveyor. While a civil engineering degree, ABET accreditation or otherwise, is not direct preparation for licensure as a professional

surveyor, some civil engineering graduates may have interest in such licensure. Degree programs that have some surveying classes may well serve such students in addition to the surveying class content being relevant to the field of civil engineering.

### **Surveying Licensure Rules in Indiana and Illinois**

The purpose of regulating the practice of surveying and engineering is “to safeguard the health, safety, and welfare of the public”<sup>5</sup>. Information from NCEES indicates that the first license for surveying was issued in California in the year 1891, sixteen years before the first license for engineering was issued in Wyoming in the year 1907.<sup>6</sup> Nevertheless, national exams for the fundamentals of surveying and the principles and practice of surveying did not occur until approximately 10 years after similar exams were developed for engineering.<sup>6</sup>

Licensure board rules in Illinois require either a bachelor degree in land surveying or a bachelor degree in a related field along with 24 credit hours of land surveying courses<sup>8</sup>. Indiana Board of Registration for Professional Surveyors rules require a minimum of 27 credit hours of surveying classes from a specified list of subject topics<sup>9</sup>. Thus, it is clear that many more than just one surveying class that is a part of a civil engineering curriculum or any other curriculum other is needed for surveying licensure.

### **Conclusion**

This paper presented a review of civil engineering and other curricula in Indiana and Illinois for surveying classes. A majority of EAC-ABET civil engineering degrees in these two states have one surveying class whereas the other degrees do not have a surveying class. Surveying licensure rules are not satisfied by a civil engineering degree nor just a few surveying classes. It

is anticipated that the concepts of this paper will be used to further investigate the issue of surveying in curricula through extension of the study to more complete evaluation of degree programs other than EAC-ABET civil engineering, other geographic areas, and review of historical information regarding why surveying has been removed. The connection of surveying with civil engineering remains in a majority of EAC-ABET civil engineering degree programs in Indiana and Illinois.

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