



The *Model Law* includes three tracks to be a surveyor intern: (1) Graduate from a four-year surveying program accredited by ABET. This program must be accredited by the ABET accreditation commission for either engineering, applied science, or technology. (2) Graduate from a four-year program related to surveying as approved by the board, with two years of progressive experience in surveying. “Related” includes engineering, physical science, and similar programs. (3) Graduate from any four-year program as approved by the board, with four years of progressive experience in surveying. After passing the FS exam and becoming an intern, the candidate needs four years of approved experience to sit for the PS exam.

The NCEES *Model Law* for surveyors protects the public by ensuring (1) quality control of candidates through application, acceptance into, retention in, and graduation from a four-year program; (2) graduation from a four-year degree program that requires a broad education in the technical, legal, business, and general education components of surveying fundamentals, such as principles and concepts, legal aspects and precedence, the importance of research of pertinent documents, interpretation of deeds and related documents, business practices; and ethical considerations; (3) passing a knowledge- or curriculum-based exam; (4) fewer disciplinary cases due to increased general communication and confidence resulting from a four-year degree; and (5) increased technological knowledge of underlying measurement/mapping methods.

Surveying and mapping data acquisition is math/science based.

A 1525 English document gives the origin of the word “survey”—a French word of two parts—SUR meaning “from above” and VEY to “see.” Therefore the word origin of “survey” means any method of identifying and measuring ground features and displaying them to scale as if viewed from above, a very broad discipline. This includes field surveying measurement and computation, photogrammetry, GIS, and satellite imagery. All of these surveying/mapping methods are math and science based. Algebra, trigonometry, higher math, physics, computer science, and other topics are required to understand the methods.

Surveying and mapping applications are based on legal, land, planning, and project requirements.

The land measurement process provides spatial data for many professional surveying applications related to land ownership, land development, and information databases.

A growing number of court/federal rules define professional as needing a minimum four-year degree.

A 1992 Florida Supreme Court case declared that surveying was not a profession because of the lack of a four-year degree standard. Kentucky courts have also stated that surveying is not a profession because of the lack of a four-year degree standard. The U.S. Department of Labor recently decided surveying is not a learned profession because of the lack of a four-year standard for entry. In response to the above court decisions, the states of Kentucky and Florida now have four-year requirements.

Surveying’s new academic identity

Prior to 1960, civil engineering was the traditional educational home of surveying, with each civil engineering program having a tenured full professor in surveying and three to five surveying courses. After World War II, surveying was cut as a professional part of civil engineering. The 1960s and 1970s were the “washout years” of surveying in civil engineering education. When one of the tenured surveying professors retired, they did not hire a surveying replacement, giving the position to another area of civil engineering (structures, hydraulics, environmental, etc.).

The first dedicated four-year program was created at the Oregon Institute of Technology in the mid- to late 1960s. The second was established at Fresno State in California. Then in the 1970s, there was a major four-year educational movement. Purdue in 1970 gained high visibility with a separate surveying program, then Iowa State, Wisconsin, Florida, Ohio State, Virginia Tech, and Maine. Today, there are about 21 ABET-accredited surveying programs in the United States and perhaps more than 30 four-year programs total.

Benefits of a Four-Year Degree Requirement for Surveying Licensure

The NCEES national surveying exam, professional progress

In 1975, NCEES produced the first national surveyor-in-training exam, followed by the PS exam. More and more states adopted the NCEES Fundamentals of Surveying (FS) and Principles and Practice of Surveying (PS) exams. Early exams were task-based to match the hands-on nature of experience-only candidates. Now, the exams are termed “knowledge based”—examining some background theory as well as practices.

Legislated four-year degree requirements

In 1972, Michigan was the first state to delete the experience method, requiring a four-year degree. The states of Minnesota, New Jersey, and Ohio followed in the late 1970s/early 1980s with four-year degree legislation. Today, a total of 28 jurisdictions have deleted the experience-only method of licensure.

Expanded scope of surveying

Before the 1970s, most state statutes defined land surveying as boundaries only. In 1971, Florida surveyors promoted a significant statute change to greatly enlarge the diversity of surveying past boundaries only. The surveyor was anyone who “determines the facts of size, shape, topography, etc.” In 1994, Florida dropped the word “land” from the statute, licensing “Professional Surveyors and Mappers.” In 1995, the NCEES *Model Law* changed to reflect a broad practice. In 2005, NCEES dropped the word “land” from its *Model Law* and *Model Rules*.

An exam alone is not a good filter for public protection.

Public protection is provided by adherence to the three-legged stool of licensure—education, experience, and examination. On its national exams, NCEES sets a cut score so that the minimally competent candidate will pass. However, the main filter for public protection in a learned profession is college admission and completion of a college program, not an exam. Lawyers, architects, doctors, dentists, and engineers pass their professional exams at nearly a 100 percent rate because they were highly selected by (1) college admissions and (2) completing the required program. The exam is not the most effective public protection method, just “one leg” of the total process.

Reduced disciplinary action

Strong evidence is developing that a four-year degree requirement leads to reduced disciplinary action. This is public protection. A generally educated person maintains more-confident communication with clients and associated professionals, leading to fewer complaints. Also, these graduates are better prepared for good business practices and ethical conduct. In a study of engineering versus surveying disciplinary actions in Kentucky in 2002, engineers had one case for each 500 licenses per year. Surveyors, without a four-year degree requirement, had one case for each 100 licenses per year—a five-time increased rate.

Experience alone not appropriate today.

Today, the technical process of field survey measurement has become programmed and automated, which means that many technicians can perform functions without knowing the underlying theory. This leads to today’s survey technicians being expert “button pushers.” Such experience is not adequate for professional preparation today.

The second approach to a four-year degree standard: the exam

The experience route is still open for engineering in a third of the states. But 99.95 percent can’t pass the FE (first day) exam without a college education. Legislative action is not needed; the exam does the job. The FS (first day) surveying exam could be shifted from a knowledge-based exam to a curriculum-based exam. A non-graduate would usually not be able to pass the first-day surveying exam.