

MICHIGAN ENGINEER (PE) PROFESSIONAL LICENSING GUIDE

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1. HOW THE PROFESSION IS ORGANIZED IN MICHIGAN

OVERVIEW

This guide looks at things that you as a foreign-educated Engineer must do to become eligible for engineer licensing in Michigan. At the same time, it includes some background and tips on the larger engineer profession to give you an idea of the variety of opportunities available as you work to rebuild your career.

REGULATING PROFESSIONAL ENGINEERS

The Michigan Department of Licensing and Regulatory Affairs (LARA), Bureau of Professional Licensing (BPL) regulates the practice of engineering in the state of Michigan.

- Professional Engineer (PE): The PE name represents a high level of training, testing and experience and can be associated with civil, electrical, mechanical, and other engineering fields. Still, you can come from a variety of engineering disciplines and become licensed as a PE. Being a PE offers you a wide range of professional practice. However, it does not allow you to design structures.
- Exemptions: There are some specific work environments where you do not have to be licensed to work legally as an engineer. There are exemptions under certain conditions for manufacturing, for government, or for military work. These are listed in Article 20, section 2012 of the Occupational Code, 1980 PA 299. One warning: you must be careful, if you leave exempt work, not to continue calling yourself an engineer or offering design services; BPL can fine people heavily in these cases.

Note to firms: If a firm contracts to provide engineering services in Michigan, at least two-thirds of the principals of the firm need to be licensed in Michigan. If the firm will include principals who are not licensed, each of those unlicensed principals must file for approval with BPL.

A LONG PATH TO LICENSING

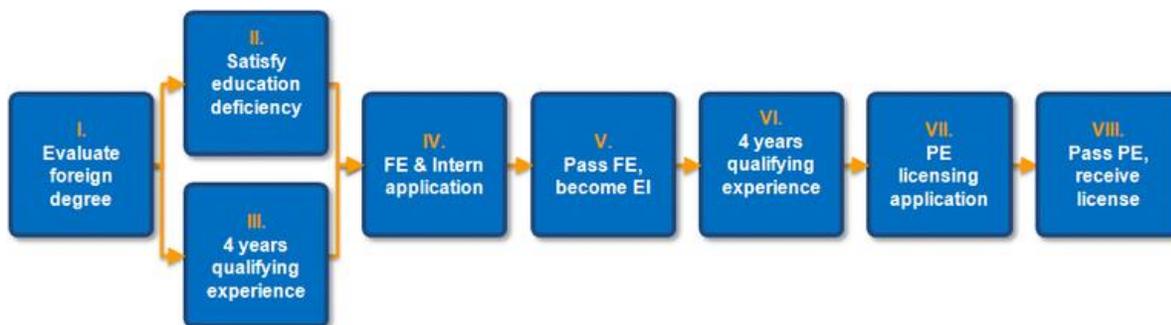
The PE licensing process is complex and takes years - even for graduates of accredited US engineering schools. However, if your US or foreign engineering school is not accredited by the Accreditation Board for Engineering and Technology – Engineering Accreditation Commission (ABET-EAC), the requirements are even more demanding. Almost all foreign-educated engineering graduates fall into this category. You may, however, be able to use education outside the US towards this requirement.

Many people choose not to license. There are many challenging and well-paid careers in engineering that do not require it. Most graduates of US engineering schools go on to work in their fields of study, but never become PEs. Whatever you decide about future licensing for your career, non-licensed positions are a way to first enter the field in the US. If you want to become licensed in the future, a non-licensed position can support you and your career goals during this long-term process. Some employers even support qualifying candidates with training or pay their licensing fees.

2. ELIGIBILITY FOR LICENSING

OVERVIEW OF LICENSING CRITERIA

The licensing process has the following steps:



I. EVALUATE YOUR FOREIGN DEGREE WITH THE NATIONAL COUNCIL OF EXAMINERS FOR ENGINEERING AND SURVEYING (NCEES)

If your university degree was in an engineering discipline, you must work with the National Council of Examiners for Engineering and Surveying (NCEES) to have it evaluated.

First, NCEES compiles information on your degree, including transcripts that must be sent directly from your university. If your materials are in a language other than English, you should check if your university will translate them and provide copies in English to NCEES. If this is not possible, you will need to have your own copy of your transcript translated and provide this to NCEES from another source. Verify with NCEES before to make sure what types of translation sources they will accept (e.g., university offices, consular offices, American Translator Association members).

Next, NCEES compares your educational materials course-by-course to standards used by the Accreditation Board for Engineering and Technology (ABET) to evaluate engineering programs. It is common for NCEES to identify foreign degrees as deficient in comparison to ABET standards. This is often because of international differences regarding when subjects are taught and the degree of specialization students are expected to have in university. For example:

- You may have finished advanced math courses in high school such as Differential Equations or Calculus I. Most US students only take these courses at the university level
- You may have taken very few humanities and social sciences courses once you began your engineering program. ABET accreditation requires 16 credit hours in such subjects to give students a well-rounded education.

It is common for your NCEES degree evaluation to have several important differences from ABET standards. This can mean you will have to go back to school and take the types of classes your evaluation describes before you can move to other steps in the licensing process. You may even have to go back and take a full year of courses. This requirement is strict and there are very few exceptions. However, you may have a few other options that can help:

- If your country has a recognized college-preparatory system such as the US Advanced Placement courses, U.K.'s A-levels, or France's Baccalaureate, you should consult with NCEES before submitting your transcripts. If you received college-level credit for them, you may be able to have them recorded in your university transcript
- If you completed a master's degree, the Professional Engineering Board can look at your courses to see if any can satisfy deficiencies in your degree.

II. MEET ANY COURSEWORK DEFICIENCIES IN YOUR DEGREE IDENTIFIED BY NCEES AND/OR BPL

Unfortunately, many of you will need to take additional classes before you can continue licensing. Here are a few strategies to consider:

- Community colleges are often a good option. They are usually more affordable than universities, closer to home, and offer evening and weekend classes
- If you need math courses because your college transcripts only show advanced math such as Calculus II, keep things simple and save study time: take lower-level courses such as Trigonometry, Calculus I, or Differential Equations
- If you need to take social sciences or humanities courses, it may help your mindset to consider this a chance to get to know US culture and society better. You can pick courses and subjects that interest you, or ones you already feel familiar with, depending on the time you have to invest
- If you are studying and working at the same time, you may be able to do steps 2 and 3 together

III. SHOW FOUR YEARS OF QUALIFYING EXPERIENCE UNDER A LEGALLY PRACTICING ENGINEER

Michigan does not have approval requirements to take the FE exam. You need to register with NCEES at www.ncees.org to take the FE exam.

As an immigrant professional who has worked in engineering in your home country, you will need to find out whether your professional experience counts as "qualifying experience" or whether you need to start again in the US workplace.

DOES YOUR PRIOR EXPERIENCE COUNT?

- You must be able to get documentation that shows the number of years you worked under the direct supervision of a legally practicing engineer and actually had certain engineering responsibilities. Do not stop at documenting four years if you have more; there are two four-year periods of experience that need proof throughout the licensing process. You may be able to get a full eight years of credit and actually be found eligible to take the PE exam immediately.
- You must be able to prove that you reported to a person who was legally practicing engineering at the time. This could include someone licensed in your country, or working in exempt positions; it could even include working under a US military engineer
- You cannot certify your own experience - someone has to state he or she was the engineer in charge

HOW DO I EARN QUALIFYING EXPERIENCE IN THE US?

If you do not have a full four years of qualifying experience, then you will need to earn the rest of the four years in a US workplace. Again, you will need to work under a licensed engineer and your work will have to include supervised engineering activities.

- Look for employment in a firm or other workplace with a professional engineer on staff and get permission for the engineer's participation in your program.
- You will have to document your work for the PE and receive his or her recommendation to meet the qualifying experience standards.
- Your exact job title is not relevant; you just need to work under a licensed engineer with increasing responsibility.
- If you change employers and/or supervising PEs over this four-year period, you must have all PEs submit documentation to account for the full amount of qualifying experience
- Once you have gathered all documentation, submit it together with the application for approval

IV. APPLY FOR FUNDAMENTALS OF ENGINEERING EXAM (FE)

Register for FE Exam:

Register to take the FE exam by going to www.ncees.org.

V. PASS THE FE

The fundamentals of engineering exam (FE) is a national test that most US engineering students from accredited programs take in their senior year or shortly after graduation.

VI. WORK FOR 4 YEARS UNDER A PROFESSIONAL ENGINEER FOR QUALIFYING EXPERIENCE

The goal is to help you continue to develop your skills under the supervision of a licensed engineer. If you have additional qualifying experience that was not counted in Step 3, it will be used here towards the four year requirement. You will finish this step by collecting VE-PNG forms for any qualifying activity. These will be included in the application in Step 7.

VII. APPLY FOR EXAMINATION FOR LICENSURE AS A PROFESSIONAL ENGINEER (PRINCIPLES AND PRACTICE OF ENGINEERING EXAM, PE)

Register to take the PE exam by going to www.ncees.org.

A. Application:

Upon completion of your education and experience training and prior to taking the Principles and Practice of Engineering (PE) examination, you must submit an online application at www.michigan.gov/mylicense. At the end of the application, a fee of \$75 must be paid by credit or debit card (the card must have a Visa or MasterCard logo).

VIII. PASS THE PE EXAM AND RECEIVE LICENSURE AS A PROFESSIONAL ENGINEER (PE)

The PE exam will be discussed in detail in the next section. Once you have passed the exam, you will be granted licensure as a Professional Engineer in the state of Michigan. Your PE license must be renewed every 2 years. Please refer to the section *Beyond Licensure* for basic information on requirements to maintain licensure.

3. TESTS

FUNDAMENTALS OF ENGINEERING EXAM

The Fundamentals of Engineering Exam (FE) is sometimes still referred to by its former name, the Engineer in Training exam (EIT). The FE tests the knowledge that is expected of recent university graduates for general engineering concepts and other specific engineering disciplines.

The examination is offered year-round and is administered by the National Council of Examiners for Engineering and Surveying (NCEES). Information regarding this exam can be found on NCEES website at www.ncees.org.

The FE exam is 6 hours long consisting of 110 questions offered in seven disciplines. They are:

1. Civil engineering: this module has 18 topics: mathematics; probability and statistics; computational tools; ethics and professional practice; engineering economics; statistics; dynamics; mechanics of materials; materials; fluid mechanics; hydraulics and hydrologic systems; structural analysis; structural design; geotechnical engineering; transportation engineering; environmental engineering; construction; and surveying
2. Other/general engineering: this module has 15 topics: mathematics and advanced engineering mathematics; probability and statistics; chemistry; instrumentation and data acquisition; ethics and professional practice; safety, health, and environment; engineering economics; statistics; dynamics; strength of materials; materials science; fluid mechanics and dynamics of liquids; fluid mechanics and dynamics of gases; electricity, power, and magnetism; heat, mass, and energy transfer
3. Chemical engineering: this module has 16 topics: mathematics; probability and statistics; engineering sciences; computational tools; materials science; chemistry; fluid mechanics/dynamics; thermodynamics; material/energy balances; heat transfer; mass transfer and separation; chemical reaction engineering; process design and economics; process control; safety, health and environment; ethics and professional practice
4. Electrical and computer engineering: this module has 18 topics: mathematics; probability and statistics; ethics and professional practice; engineering economics; properties of electrical materials; engineering sciences; circuit analysis; linear systems; signal processing; electronics; power; electromagnetics; control systems; communications; computer networks; digital systems; computer systems; software development
5. Environmental engineering: this module has 14 topic areas: mathematics; probability and statistics; ethics and professional practice; engineering economics; materials science; environmental science and chemistry; risk assessment; fluid mechanics; thermodynamics; water resources; water and wastewater; air quality; solid and hazardous waste; groundwater and soils
6. Industrial engineering: this module has 13 topics: mathematics; engineering sciences; ethics and professional practice; engineering economics; probability and statistics; modeling and computations; industrial management; manufacturing, production, and service systems; facilities and logistics; human factors, ergonomics, and safety; work design; quality; systems engineering
7. Mechanical engineering: this module has 15 topics: mathematics; probability and statistics; computational tools; ethics and professional practice; engineering economics; electricity and magnetism; statistics; kinematics, dynamics, and vibrations; mechanics of materials; materials

properties and processing; fluid mechanics; thermodynamics; heat transfer; measurements, instrumentation, and controls; mechanical design and analysis

Your background in a specific field of engineering practice such as mechanical or civil engineering may make choosing its module an easy decision. However, you may also wish to consider general engineering, especially if your test preparation time is limited.

All reference materials, such as formula sheets, are provided by NCEES. However, test takers must provide their own calculators, chosen from an NCEES-approved list.

THE PRINCIPLES AND PRACTICE OF ENGINEERING EXAM (PE)

The Principles and Practice of Engineering Exam (PE) is an exam for Engineering Interns. It tests the theoretical and practical engineering knowledge you have gained through a minimum of four years of qualifying employment experience under the guidance of a legally practicing engineer. NCEES offers 17 distinct PE exams. We will cover the PE - Civil exam and PE - Mechanical exam below. For more information on the other types of exams, please see the *Important Links* section.

THE PE EXAM

- The PE Exam consists of a full day of testing in one morning and one afternoon session of 4 hours each.
- The PE exam is offered two times a year, in April and October.
- Registration opens several months in advance.

All reference materials for both morning and afternoon sessions, such as formula sheets, are provided by NCEES. Test takers must provide their own calculators, chosen from an NCEES-approved list. Results of both tests are combined to create your total score.

You can find practice tests, test preparation classes, and study groups that can be great tools to help you pass your tests in the *Important Links* section.

THE PE - CIVIL EXAM

The morning session, called the Breadth Exam, is standard for all PE - Civil test-takers. It has 40 questions covering the five areas that constitute civil engineering: construction, geotechnical, structural, transportation, and water resources/environmental engineering.

The afternoon session, called the Depth Exam, is a 40-question exam in which you choose one of the five practice areas covered in the morning session.

THE PE - MECHANICAL EXAM

The morning session, called the Breadth Exam, is standard for all PE - Mechanical test-takers. It has 40 multiple choice questions covering the 3 areas that constitute mechanical engineering: HVAC and Refrigeration; Mechanical Systems and Materials; and Thermal and Fluids Systems.

The afternoon session, called the Depth Exam, is a 40-question exam in which you choose one of the 3 practice areas covered in the morning session.

4. TIME AND COSTS

FACTORS THAT CAN INFLUENCE TIME AND COST OF PROCESS

Evaluating your foreign degree and achieving licensing as a professional engineer in Michigan depends on many factors:

- The completeness of your educational and professional records (the more documentation, the better)
- The size of the gap between your engineering degree and US accreditation standards
- Your performance on FE and PE licensing exams and their timing
- Your access to employment that can bring you necessary qualifying experience
- Your free time and what you can afford to spend on licensing

We provide two hypothetical scenarios to show some of the variety of results that immigrant professionals may find when they seek to become professional engineers in Michigan. Please consider these scenarios as two examples out of many possibilities. Your experience will vary.

TWO POSSIBLE SCENARIOS FOR PE LICENSING:

Step	More Efficient Scenario <i>Approximate Time and Cost</i>	Less Efficient Scenario <i>Approximate Time and Cost</i>
1 Degree Evaluation	<ul style="list-style-type: none"> • Your university documents arrive to the credentialing organization within one month • The original documents are in English, so no translation is needed • 2 months + \$400 	<ul style="list-style-type: none"> • It takes 4 months for your documents to arrive to CPEES • Your documents must be translated • 6 months + \$650
2 Satisfy Education Deficiency	<ul style="list-style-type: none"> • You have a Masters degree in civil or mechanical engineering and documented qualifying professional experience • You only have to take 3 university courses (9 credit hours) before being eligible to sit for the FE exam • You pass it on the first try • 6 months + \$2,700 	<ul style="list-style-type: none"> • Your degree equivalency lacks 12 courses (36 credit hours) • 3 years + \$10,000
3 4 years of qualifying experience	<ul style="list-style-type: none"> • You have 4 years of documented qualifying professional experience • No additional time 	<ul style="list-style-type: none"> • You are granted only 1 year of qualifying professional experience from your home country • You work full time while attending classes, completing your qualifying professional experience and coursework in 3 years • 3 years
4 Pass FE Exam	<ul style="list-style-type: none"> • You pass the FE exam on the first try 	<ul style="list-style-type: none"> • You pass the FE exam on the first try

Step	More Efficient Scenario <i>Approximate Time and Cost</i>	Less Efficient Scenario <i>Approximate Time and Cost</i>
	<ul style="list-style-type: none"> 6 months + \$168 	<ul style="list-style-type: none"> 6 months + \$168
5 4 years qualifying experience	<ul style="list-style-type: none"> Your current employment is in the your engineering field You are able to arrange supervision of your work by a legally practicing engineer 4 years 	<ul style="list-style-type: none"> Changing jobs, you work for 5 years to gain 4 years of qualifying experience for the PE - Mechanical exam 5 years
6 PE Licensing application	<ul style="list-style-type: none"> You receive a recommendation from that supervisor for your qualifying experience You pass your PE exam with just a few months' preparation 6 months + \$100 	<ul style="list-style-type: none"> You take the test but fail the first time After taking a preparation class, you pass the second attempt 1 year, 2 months + \$1,100
7 Pass PE, receive license	<ul style="list-style-type: none"> Your employer pays for the exam and license application BPL approves your application 2 months later 2 months 	<ul style="list-style-type: none"> BPL approves your application 5 months later 5 months + \$65
	More Efficient Total <i>About 6 years + \$3,500</i>	Less Efficient Total <i>About 13.5 years + \$12,000</i>

5. OTHER CAREERS AND CREDENTIALS

The breadth of the engineering field and the high numbers of positions that do not require licensing make other careers in engineering very attractive to foreign-educated professionals. Here are just a few notes on in-demand credentials or job titles to start you in your research. The Occupational Outlook Handbook from the Bureau of Labor Statistics in *Important Links* can give you a better idea of the responsibilities in these and other careers in engineering.

Preparing for licensing takes a significant amount of time, money, and effort. Some professionals choose to seek lower-level positions in engineering to help them meet longer-term licensing goals. If you take a job with fewer responsibilities but with access to a supervising PE, you may find some distinct advantages. These include the ability to build job security, polish technology skills and adapt to the US workplace culture in a lower-pressure environment, and to have more energy left over to focus on preparing for licensing exams. You should be honest with your employer about your long-term plans and be sure that they understand how you can contribute to their company's objectives.

ENTRY-LEVEL

DETAILER/DRAFTER - COMPUTER-AIDED DESIGN AND DRAFTING

- Typically, knowledge of CADD software is a prerequisite for this position, which involves the preparation of detailed drawings for manufacturing or construction
- 2 years of college typical
- 2010 median earnings nationally: \$47,880

MECHANICAL ENGINEERING TECHNICIAN

- This position applies engineering principles narrowly, usually to solve specific problems in Research and Development
- 2 years of college typical
- 2010 median earnings nationally: \$50,110

HIGHER SKILLED

PROJECT MANAGEMENT PROFESSIONAL CERTIFICATION

If you have prior experience of project management and particularly strong communication and organizational skills, you may want to consider qualifying for the Project Management Professional (PMP) certification from the Project Management Institute. The PMP is a widely-recognized credential that can complement an engineering background, as many large engineering projects require both project skills and mastery of technical specialties. Again, if your soft skills prepare you for this kind of work, it is a way to work actively in the engineering field without having to hold professional licensure.

CONSTRUCTION MANAGER

Construction management certificates also offer a way of differentiating you in the medium term and saving resources while still maintaining a critical role in the civil engineering field. Construction management is a viable option if you have excellent communication and organizational skills and have already worked in this capacity in your career.

LEED CERTIFICATION PROFESSIONAL

Green building and Leadership in Energy and Environmental Design (LEED) certification depend, in part, on systems that fall to mechanical engineers, such as heating and cooling. Given trends towards large-scale investment in environmentally-friendly building and rehabilitation, getting certified to assess projects for LEED can be an interesting credential for an engineer with the right transferable skills.

6. BEYOND LICENSING

SETTING UP YOUR BUSINESS

If you plan to have your own engineering business, it is important to know that you may have to register as a Professional Design Firm. This is not required if you plan to do business under "Your Name, PE" and work alone (in what is called a sole proprietorship). However, if you plan to do business by another name or to include others in your practice you will need to license. Information is available on BPL's website.

MAINTAINING LICENSURE

Once you are licensed as a professional engineer you must maintain your Michigan license by renewing it every 2 years. The license expires October 31 two years after the initial license and every two years that follow. You will be notified in the mail and can renew on BPL's website using online payment.

RENEWAL VS. RESTORATION

Be careful to observe your renewal notices and keep your address updated. To restore an expired license requires more documentation, fees, and sometimes, coursework. To keep informed of regulation requirements and update your skills, you may consider joining a professional association (see below).

LICENSING MOBILITY (RECIPROCITY)

Some people with PE licenses from one state want to practice engineering in another state. The autonomy of each state's professional regulation creates differences that complicate licensing mobility. The state of Michigan does not participate in any agreements with other states and individuals who wish to be licensed must complete an application and meet Michigan's licensing requirements.

If you are a recognized PE from another state and are seeking to practice engineering in Michigan, you must:

- Show that your education and experience meet all Michigan eligibility criteria for licensing as a PE
- Apply for and receive a Michigan license in addition to your existing license

Conversely, when Michigan PEs want to work in other states, they must research and meet the licensing guidelines of their destination state. Some employers see the value in helping their engineers with licensing mobility when their business crosses state boundaries.

7. IMPORTANT LINKS

FOREIGN DEGREE EVALUATION:

- The [National Council of Examiners for Engineering and Surveying \(NCEES\)](#) is the credential evaluation service for foreign-educated engineers accepted by the state of Michigan
- The [American Association of Collegiate Registrars and Admissions Officers \(AACRAO\)](#) must review your foreign degree if your degree was not directly in engineering

REGULATION:

- The Michigan [Bureau of Professional Licensing](#) is the state regulatory agency for the professional engineers in Michigan. The website specifically for the professional engineers is www.michigan.gov/engineers, which includes useful information with links to forms and applications.

TESTING:

- The [National Council of Examiners for Engineering and Surveying \(NCEES\)](#) has a wealth of information about exams including test preparation materials
- [NCEES Exams Section](#) with important site links to both FE and PE exam information
- [NCEES Official information on the PE Exam](#), with details for both the Breadth and Depth sessions
- [NCEES Official information on the FE Exam](#), with details for both the Breadth and Depth sessions
- [FE and PE testing dates and registration information](#)
- [FE Supplied-Reference Handbook](#) contains equations and data you will need for the exam
- [Study materials for sale online](#)

OTHER:

- The Occupational Outlook Handbook from the Bureau of Labor Statistics has articles on [Architecture and Engineer Occupations](#) and on [Drafters](#)
- Different credentials offered by the [Green Building Certification Institute for LEED](#) (Leadership in Energy and Environmental Design)