Steps to Professional Licensure for Purdue Engineering Students

Dr. Vincent P. Drnevich, P.E., D.GE., Dist.M.ASCE
Professor Emeritus, School of Civil Engineering, Purdue

Disclaimer

The information provided by this lecture is that of Prof. Drnevich as an individual and does not represent an official position of the Indiana Registration Board for Professional Engineers or the Indiana Society of Professional Engineers.

Topics:

- Engineers in the profession
- Law on the Practice of Engineering
- Why get licensed?
- Professional Registration
- Professional/Technical Societies
- Concluding Thoughts
- Address questions

Professional Engineer

IC 25-31-1-2 (b)

"Professional engineer" means an individual who, by reason of that individual's special knowledge of the mathematical and physical sciences and the principles and methods of engineering analysis and design which are acquired by education and practical experience, is qualified to engage in the practice of engineering as attested by that individual's registration as a professional engineer.

Who can practice engineering?

According to the law, only licensed professional engineers can practice engineering

Practice of Engineering

IC 25-31-1-2 (d)

"Practice of engineering" means any service or creative work that the adequate performance of requires engineering education, training, and experience in the application of special knowledge of the mathematical, physical, and engineering sciences to services or creative work that includes the following:

(1) Consultation.
(2) Investigation.
(3) Evaluation.
(4) Planning, including planning the use of land and water.
(5) The design of or the supervision of the design of engineering works and systems.
(6) Engineering surveys and studies or the supervision of engineering surveys and studies, ...
(7) Evaluation of construction for the purpose of assuring compliance with specifications, plans, and designs, in connection with any public or private utilities, structures, buildings, machines, equipment, processes, work systems, or projects.

Industrial Exemption

IC 25-31-1-20

Exempt persons

(a) An employee or a subordinate .....

(b) This chapter does not require registration for the purpose of practicing engineering by an individual or a business:

(1) on property owned or leased by that individual or business unless the engineering practice involves the public health or safety, or the health or safety of the employees of that individual or business;

(2) for the performance of engineering which relates solely to the design or fabrication of manufactured products; or

(3) that is registered as a landscape architect under IC 25-4-2 and while the individual or business is engaged in the practice of landscape architecture planning the use of land or water.

Professional Registration

- Required by law for the professional practice of engineering
- Each state and territory has a "registration law"
- Implemented by a Board of Registration http://www.in.gov/pla/engineer.htm
- National Council of Examiners for Engineering and Surveying (NCEES) generate and grade the FE and PE exams used by boards of registration http://www.ncees.org

Why Get Licensed?

- Mark of a professional
- Required for practice engineering involving health, welfare, and safety of the public
- Ethics requirements
- Career development and growth
- Prestige and respect
- Flexibility
- Salary

Steps to Professional Licensure

1. Graduation from program in engineering acceptable to the Board (ABET accredited)
2. Passing the Fundamentals of Engineering (FE) Exam

3. Four years of engineering practice experience
   One year granted for MS degree in engineering
   Two years granted for PhD degree in engineering
1. Passing the Principles and Practice (PE) Exam

Fundamentals of Engineering (FE) Exam

- Until January 2014 it has been offered twice a year nationwide, once in April and once in October.
  - The last time this type exam can be taken is October 26th.
  - The deadline for registration for it was September 5th.
  - Test locations – Purdue (students only) and Indianapolis
- In Indiana, can only be taken in the last semester before graduation or after graduating
- 8 hour exam on a Saturday

Morning session – all engineering students take same exam

- Fundamentals of Engineering (FE) Examination Morning Session (120 questions in 12 topic areas)

Afternoon Session of FE Exam

- Chemical
- Civil
- Electrical
- Environmental
- Industrial
- Mechanical
- Other Disciplines

Computer-Based FE Exam

- Starts in January 2014
- Is taken at Pearson-Vue Testing Centers
- http://www.youtube.com/watch?feature=player_embedded&v=yyhdrZW138E
- Available over four, two-month-long testing windows each year
  - Window 1: Jan-Feb
  - Window 2: April-May
  - Window 3: July-Aug
  - Window 4: Oct-Nov
- Apply to NCEES to register for FE and FS exams
- Provide information
- Pay $225 fee
- Schedule Exam with Pearson-Vue
  - Choose location (Purdue will be among many in every state to choose from)
  - Choose from dates available.
- The FE exam is a computer-based test (CBT). It is closed book with an electronic reference.
- Examinees have 6 hours to complete the exam, which contains 110 multiple-choice questions.
- The 6-hour time also includes a tutorial, a break, and a brief survey at the conclusion.
- The FE exam uses both the International System of Units (SI) and the US Customary System (USCS).
- Seven separate exams:
  - Chemical CBT Exam Specifications
  - Civil CBT Exam Specifications
  - Electrical and Computer CBT Exam Specifications
  - Environmental CBT Exam Specifications
  - Industrial CBT Exam Specifications
  - Mechanical CBT Exam Specifications
  - Other Disciplines CBT Exam Specifications
- Get details at: http://cbt.ncees.org/major-domains-for-the-fe-exams-beginning-in-2014/

Engineer-in-Training (EIT)

Once the required education is completed and the FE exam passed **must apply to State Board for certification as an EIT**.

- Requires submitting transcripts
- Must be certified as EIT before taking PE exam.
- All state boards accept passed FE exam
- FE exam does not expire
- Indiana Board information available at: http://www.in.gov/pla/engineer.htm

Principles and Practice (PE) Exams

(Typically taken after 4 years of engineering practice experience)

- Agricultural
- Architectural
- Chemical
- Civil: Construction (with updated design standards for October 2013)
- Civil: Geotechnical
- Civil: Structural
- Civil: Transportation (with updated design standards for October 2013)
- Civil: Water Resources and Environmental
- Control Systems
- Electrical and Computer: Computer Engineering
- Electrical and Computer: Electrical and Electronics
- Electrical and Computer: Power

- Environmental
- Fire Protection
- Industrial
- Mechanical: HVAC and Refrigeration
- Mechanical: Mechanical Systems and
- Materials
- Mechanical: Thermal and Fluids Systems
- Metallurgical and Materials
- Mining and Mineral Processing
- Naval Architecture and Marine
- Nuclear
- Petroleum
- Software
- Structural (with design standards for October 2013)

Register for Exams at NCEES, LLC.

- Handles registration and administration of exams http://www.ncees.org/Exams.php
- Very strict rules and security
- Closed book; on-line booklet provided
- Calculator Policy - http://www.ncees.org/Exams/Calculator_policy.php

Frequently asked questions

- http://www.ncees.org/Exams/FE_exam.php
- https://engineering.purdue.edu/Engr/Academics/FE_FS_Exams/apply
  (Not yet updated for CBT exams.)
- Review Sessions sponsored by Chi Epsilon
- https://engineering.purdue.edu/Intranet/Groups/Administration/UE/FE_Exams/ (Not yet updated for October 2013 FE exam or CBT exams.)

Increases in Education Requirements??

- NCEES Model Law proposal for implementation in 2020
- Bachelors degree from ABET accredited program
- Following BS degree, acceptable coursework equivalent to that of the Masters Degree
- Model Law is starting to be considered by states
- State Laws control engineering licensure

Continuing Education

- 39 of the states now have Continuing Education requirements for maintaining licenses.
- Typically require 24 to 30 hours per biennium for renewal of license
- Approved activities vary, but always include courses and short courses related to the practice of engineering
- Rules for Indiana were established in 2010

Professional and Technical Societies

- Source of new knowledge and technologies
- Sense of identity to the professional
- Represents the profession to government and society
- Develop leadership skills
- Networking
- Other

Recommended Prof./Tech. Orgs.

- Professional Org.
  - NSPE/ISPE with local chapters and student chapters (PSPE at Purdue)
  - SWE, NSBE
  - Honor Societies, e.g. Tau Beta Pi, Chi Epsilon, etc.
- Technical Orgs.
  - Basic Founder Societies, e.g. ASABE, ASCE, ASME, IEEE, IIE, etc.
  - Specialty Societies, e.g. ASTM , ITE

Comprehensive listing of all Engineering student organizations:
https://engineering.purdue.edu/Engr/Academics/StudentOrganizations/

Things you need to do:

- Obtain a broad engineering education
- Keep in mind the topics covered in the FE Exam
- Plan to take the FE Exam
- Apply for it at the beginning of the last semester before graduating
- Choose a job that provides qualifying work experience for the PE Exam
- Prepare for and take the PE Exam at your earliest possible date
- Continue participating in professional and technical organizations after graduation
- Continue to learn about your profession

Vince Drnevich
E-mail: drnevich@purdue.edu