This column addresses aspects of lifelong learning for current students, alumni, and faculty. Examples of student and faculty activities that involve industrial practice and engagement as well as continuing education are welcome. These topics may not always lend themselves to the traditional scholarly format with formal assessment and extensive literature review but may be more editorial in nature. Please submit manuscripts to Professor Lisa Bullard at lisa_bullard@ncsu.edu

WHAT STUDENTS AND FACULTY SHOULD KNOW ABOUT PROFESSIONAL LICENSURE

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Most chemical engineering (ChE) students know very little about professional licensure and the Fundamentals of Engineering (FE) exam, and many of those who know think that licensure is something civil engineers have to get but nothing they (as chemical engineers) have to bother with. In fact, licensure is something all ChE students should be thinking about in their senior year. Consider sharing with your students the following dialogue between a hypothetical chemical engineering professor, Dr. FE Xam, and one of his/her students.

Taylor: *Dr. Xam, isn't the FE exam just for Civils?*

Dr. Xam: *No, it's definitely not! Taking the FE exam is the first step in becoming a licensed engineer, no matter the engineering discipline. There are specific versions of the FE for all major engineering disciplines, and 2,274 chemical engineers took the FE exam just last year.*[1]

Taylor: *Yeah, but do I really need it as a Chem-E?*

Dr. Xam: *Well, if you can tell me what you are going to be doing professionally 10, 20, or 30 years from now, I could make a guess.*

Taylor: *Wow, I have no idea—I don't even know for sure what I'm going to be doing next week! What type of jobs need it?*

Dr. Xam: *It's particularly important if you work on projects*

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that deal with state, local, or federal governments. Most consultants are registered professional engineers (PE's). Even within large companies employing chemical engineers, there are engineers in certain job functions like equipment design, plant design, and environmental and capital project management who are encouraged to become licensed professional engineers. Some states have requirements that you must be a PE to be in "responsible charge" of a project as a project manager or design lead. Even students who get Ph.D.s may find that they need to be a licensed PE to practice in their chosen field. Having the credential may enhance your compensation or promotion opportunities.

Taylor: *Can't I just take the exam when and if I need it?*

Dr. Xam: *Well, you could take it later, but it will require more effort on your part, and that may be enough to discourage you from applying for jobs that require or reward someone who has a professional engineering license. The FE is really designed for graduating seniors, so you're as prepared now as you ever will be —10 years from now, it will be tough sledding. The FE exam has no expiration date, so you can take it now and be covered even if you decide to pursue licensure later in your career.*

Taylor: *What if I fail, won't it look bad?*

Dr. Xam: *First of all, you probably won't fail the exam if you invest a modest amount of time preparing. It's a pass/fail exam, and around 3/4 of the first-time Chem-E test takers pass on their first attempt.[1] Collectively, schools know how many students take and pass the exam, and many use the results for their accreditation process, but your name is not attached. Worst case, this lets you know what areas you may need to work on. Just brush up on those subjects and take it again—no big deal. You can take the exam up to three times in one year.*

Taylor: *Are there any other upsides to taking the FE exam?*

Dr. Xam: *Definitely—it never hurts to include on your resume that you have passed the FE. Employers and potential clients view it as a sign of your credibility. Also, educational researchers now know how important it is for long-term retention to review material after some, but not too much, time has passed.*

Taylor: *So having to recall all that old stuff I partially forgot helps me remember it better long-term?*

Dr. Xam: *Exactly—it's called the testing effect,[2] and by taking the FE you are combining it with spacing, so it is even more powerful. It's even better if you do a little studying along the way!*

Taylor: *Yeah, but will they put a bunch of stuff on the exam that I've never seen?*

Dr. Xam: *There's a reason it's called the fundamentals of engineering exam. The questions on the exam are specified and written by practicing engineers and professors who put a lot of effort into making sure that they cover concepts that all chemical engineers should recognize. You can get sample questions from each of the covered subject areas from NCEES—the people who develop the exam.*

Taylor: *I heard it's a long exam. Is it offered on campus?*

Dr. Xam: *It's true, the exam is about 6 hours long, including a break for lunch. It tries to cover a good portion of your curriculum with 110 mostly multiple-choice questions, so it makes for a long day. There are other types of questions, and you can find those on the NCEES website.[3] The exam is given on the computer at a secure testing center. Most universities have at least one within an hour's drive. You can schedule the exam where and when it's convenient for you. Some students decide to take it in the fall or spring of their senior year; others decide to wait until right after graduation before starting work or grad school.*

Taylor: *How should I study for this exam?*

Dr. Xam: *There are all kinds of resources. Several schools like ours offer a review course each semester. There is also a reference handbook that you're given to use during the exam—downloading the handbook from the NCEES website and becoming familiar with the content before the exam would be wise. NCEES has review and practice material[4] as well as a YouTube channel[5] with useful information. LearnChemE[6] has an entire (free!) video series on studying for the FE. If that's not enough, several publishers have review material that you can purchase. I think our library has some of those resources.*

Taylor: *How much will the exam cost? I'm just a poor student, you know!*

Dr. Xam: *It currently costs $175[7] for the exam—less than the cost of some of your engineering textbooks. I would consider it an investment in your future. Most companies and organizations will pay for your professional registration fees if you become a PE.*

Taylor: *So after I pass the exam, am I a licensed engineer?*

Dr. Xam: *No—the term is usually Engineer in Training (EIT). The exact requirements for engineering licensure vary from state to state, but after passing the FE, you will have to work as an EIT for typically four years, get some professional references, and take the Principles and Practice Exam, commonly called the PE exam. You really only need to worry about those steps when and if you decide to be licensed—passing the FE just keeps your options open.*

Taylor: *What if I move to another state after graduation—does the exam still count?*

Dr. Xam: *No problem—the FE exam is a nationally standardized exam that is the same everywhere in the United States and U.S. territories, so the EIT status is accepted in all states and territories.*

Taylor: *So, besides the money, what are the downsides to*

taking the exam?

Dr. Xam: *I really cannot think of any. I've never had a student who regretted taking the FE, but there have been several who didn't and wish they had. I'm thinking of one alum who contacted me several years after graduation and urged me to make sure that students take the exam before starting work.*

Taylor: *Thanks for your advice, Dr. Xam. I think I'm going to take the FE exam right after graduation.*

Dr. Xam: *Good choice. Consider signing up for the School of Engineering's review course and go to the NCEES website[3] for more details. If you have any more questions, stop by my office and let's talk. Good luck!*

REFERENCES

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