

Take the Ag Engineering PE Exam ... for free?

An offer you can't refuse

Not only is this the Last Word about why you should become a Professional Engineer (PE), but this article will also tell you about the new test specification, the myriad of resources available to help you study, and an opportunity for you to take the Agricultural Engineering (AE) PE examination for free. That's right, for free.

Here's why you should become an AE PE

Personally, I take great pride in being a licensed Professional Agricultural Engineer. As a university professor, I wasn't required to be licensed, but I felt that I should be an example to my students and show that I am qualified to teach engineers as well as practice outside of the university. Every semester, I tell my students that I am prouder of my PE than I am of my PhD because, while the PhD certainly required hard work and tenacity, the PE says that I'm professionally recognized. It proves that I can both teach it and DO it. In fact, for the last seven years, I've been involved in preparing and assembling the AE PE exam. That has been a challenge, but I've found it rewarding because it's been a great way to give something back to my profession.

That experience has also allowed me to uncover some common myths about the AE PE exam that need to be debunked. Here they are:

"The AE PE exam is too broad"

The test specification for the AE PE exam is revised every six or seven years to adjust to changes in practice. ASABE just completed an extensive survey of practicing PEs to establish a new test specification. The new specification is actually narrower than the previous specification, which should make it easier to prepare. The exam has a total of 80 multiple-choice questions in the major categories (for more detail go to: www.nces.org/Exams/PE_exam.php):

- Engineering principles and professional practice (16 questions)
- Facility engineering: Plant, animal, and commodity environments and structures (12 questions)
- Machine systems: Power, electrical/electronics, machines, controls, and sensors (20 questions)

- Natural resource engineering: Soil, water, and plant systems (24 questions)
- Process engineering: Food, feed, fiber, and fuel products (8 questions).

"The AE PE exam is harder than other PE exams"

First of all, there is some confusion over what it takes to pass the exam. The PE exam is developed to test for minimal competence, not excellence. The actual score required to pass changes from year to year, and it's adjusted based on the exam difficulty. A good target to shoot for is to nail the questions in the Engineering Principles and Professional Practice category and your category of expertise (e.g. Natural Resources Engineering), and then try to confidently answer at least 25 percent of the questions in each of the remaining categories. The AE PE exam has passing rates comparable to other PE exams, with 70 percent to 80 percent of first-time takers passing. Exams in other disciplines are just as broad and likely include topics that practicing agricultural and biological engineers may not have experienced.

"My degree is in biological engineering. Should I take the AE PE exam?"

Absolutely! Just remember that agricultural engineering is a unique and special discipline within the broad field of biological engineering, which also includes biomedical, biomolecular, ecological, environmental, biochemical, and bioprocess engineering. Agricultural engineering is the discipline for those who are charged with coordinating plant and animal production for the world in the years ahead. Agricultural engineering operates at the interface of civil, mechanical, and electrical engineering, with additional basic knowledge of plants and animals as applied for food, feed, fiber, and fuel production. Agricultural engineering is essential, and just don't take my word for it: in 2008, agricultural engineering was ranked No. 1 by CareerBuilder.com in its Top 10 Engineering Jobs.

“There aren’t enough study resources in AE”

There are more resources available than you may realize. A summary of the resources can be found at www.bae.ncsu.edu/www3/pe/. One of the most helpful resources is the webinar series. This series contains review sessions in which you can participate live or watch later. Past participants have found these sessions to be very helpful. The site also has a list of references, including all the books used in preparing the exam. ASABE also offers study resources that you will find helpful. A set of sample exam questions is being developed and will be available on the ASABE website (www.asabe.org) by May 31.

“Why take the AE PE instead of the CE or ME?”

Because of professional pride, to put it plainly. Every graduate from an ABET-accredited agricultural engineering, or similarly named, program with the minimum experience should take the AE PE exam. It’s a way of standing up for our discipline. To take the exam in another discipline only propagates ignorance about what agricultural engineers can really do. As a trained agricultural engineer, you already have basic knowledge and experience in several of the exam areas. With a little studying, you should be able to master a few more areas competently enough to pass the exam.

Here’s the deal: Take the AE PE exam for free!

To help overcome the limited availability of licensed Professional Engineers in our field and to encourage others in closely related disciplines within biological engineering to become part of our profession, ASABE, partnering with PEI, is offering to reimburse the AE PE exam application/test fee (up to \$300) for up to 25 first-time takers for October 2010. This offer to reimburse the application/test fee is for a limited time and is available only to ASABE members. Potential examinees should grab this offer while they can. Watch the ASABE website (www.asabe.org) for further details on how to sign up.

Every engineer should strive to become a PE as a professional goal. As an agricultural engineer, passing the AE PE exam will further your career, and it will show the world that you are a qualified professional. In addition, taking the AE PE exam now will help ASABE sustain this exam for the next generation of agricultural engineers. Now is the time to step up, and it won’t cost you a dime. That’s an offer you can’t refuse!

ASABE member Jay D. Harmon is professor and extension livestock housing specialist, Department of Agricultural and Biosystems Engineering, Iowa State University, Ames, USA; jharmon@iastate.edu.



Sample AE PE question and solution

A flood control reservoir is being designed for a 40 square mile watershed. The average annual soil loss is 8 tons/acre. The design includes flood storage of 350 acre-feet, sediment storage of 127 acre-feet, and permanent pool storage of 300 acre-feet. The sediment delivery ratio is expected to be 17% with an average density of 127 lbs/cubic foot. The life of the reservoir based on sediment capacity is most nearly:

- A. 10 years B. 25 years C. 35 years D. 50 years

Solution

- $40 \text{ square miles} \times 640 \text{ acres/sq mile} \times 8 \text{ tons/acre/year} \times 0.17 \text{ delivery ratio} \times 2000 \text{ lbs/ton} \times \{1 \text{ acre}/43560 \text{ ft}^2\} \times \{1/127 \text{ lbs/ft}^3\} = 12.6 \text{ acre-feet per year.}$
- Planned sediment capacity is 127 acre-feet, so: $127 \text{ acre-feet} / 12.6 \text{ acre-feet/year} = 10.1 \text{ years.}$ Therefore, answer A is most nearly correct.

This problem addresses the concept that sediment (soil) will erode from a watershed and fill a flood control reservoir, making the reservoir ineffective for flood storage after a period of time. Designers plan for a certain life for such structures by including sediment storage at the lowest elevations of the reservoir so that the impoundment can provide flood control for many years before sediment blocks the outflow structure. “Flood storage” is the capacity allowed in the event that a large storm needs to be held to avoid downstream damage to property. “Permanent pool storage” is the volume of water to be held in the reservoir most of the time, perhaps providing a lake for recreational activities. “Sediment storage” is the capacity that is designed to be filled by sediment over the reservoir’s life.