



2009 NSBE Region 5 FRC/PDC

Strategies For Passing The Professional Engineering Licensing Exams (FE And PE)

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CARLES MILLER

- ❖ Palestine, Texas
 - East Texas of about 20,000 people.
- ❖ University of Kansas
 - M.S. in Engineering Management
- ❖ Texas A & M University-Kingsville
 - B.S. in Electrical Engineering
- ❖ Del Mar College
 - A.A. in Business Administration
- ❖ Texas State Technical College
 - A.A.S. in Electrical Technology





THZAIRA CHARLES

- ❖ Maplewood, NJ (native of Queens, NY)
 - Maplewood is a North Jersey Township of about 36,000 people.
- ❖ Cooper Union for the Advancement of Science and Art
 - M.E. in Chemical Engineering with a concentration in Environmental Engineering
 - Thesis Topic: Removal of Phenol from Contaminated Water via a Continuous Process
 - B.E. in Chemical Engineering
- ❖ Port Authority of New York and New Jersey
 - Engineering/Architecture Design Division – Environmental Engineering Unit
 - Focus Remediation and Environmental Compliance at JFK Airport
- ❖ Lastly
 - 2009-2010 National Alumni Chair Elect



The Exam

- ❖ The exam consists of
 - two four-hour sessions
 - administered on a single day
- ❖ The FE exam covers subject matter taught in a typical EAC/ABET-accredited baccalaureate engineering program.
- ❖ The Principles and Practice exams test academic knowledge and knowledge gained in engineering or surveying practice.
 - More detail <http://www.ncees.org/exams/>



Exam Dates

❖ FE

- October 24, 2009
- April 17, 2010
- October 30, 2010
- April 9, 2011
- October 29, 2011

❖ PE

- October 23, 2009
- April 16, 2010
- October 29, 2010
- April 8, 2011
- October 28, 2011



What can I take?

❖ FE

- No reference or note materials are allowed to be taken into the FE exam.
- You can take in two calculators.
- You will be issued a reference book and a mechanical pencil.

❖ PE

- Bound reference and/or note materials are allowed to be taken into the PE exam.
- More detail
<http://www.ncees.org/>



Calculators

- ❖ Each year, NCEES updates list by November 15.
 - <http://www.ncees.org/exams/calculators/#approved>

- ❖ The Only Calculators Permitted For The 2009 Exam.
 - **Casio:** All **fx-115** models. Any Casio calculator must contain **fx-115** in its model name.
 - **Hewlett Packard:** The **HP 33s** and **HP 35s** models, but no others.
 - **Texas Instruments:** All **TI-30X** and **TI-36X** models. Any Texas Instruments calculator must contain either **TI-30X** or **TI-36X** in its model name.

- ❖ ***NO OTHER MODELS OF CALCULATORS ARE PERMITTED IN THE EXAM ROOM.***



Exam (morning session)

- ❖ The FE exam consists of
 - morning session includes 120 multiple-choice questions worth one point each.
 - Each question has four answer choices

- ❖ The PE exam
 - More detail <http://www.ncees.org/exams>



Exam (afternoon session)

- ❖ Your choices are:
 1. Chemical
 2. Civil
 3. Electrical
 4. Environmental
 5. Mechanical
 6. Industrial
 7. General
- ❖ The first six tests "discipline-specific" exams.
- ❖ "general" test.
- ❖ 60 multiple-choice questions worth two points each. Each question has four answer choices.

General or Specific (afternoon)



- ❖ Your choice
- ❖ Taking the General exam - study same morning material
- ❖ You may be more comfortable with exam on your own field.
- ❖ **Best To Choose Before The Test**



FE Pass Rate

	First-time	Repeat
❖ Chemical	83%	29%
❖ Civil	80%	38%
❖ Electrical	73%	26%
❖ Environmental	85%	43%
❖ Industrial	74%	37%
❖ Mechanical	83%	32%
❖ General	77%	31%
❖ Passing between 55% - 60% correct		



PE Pass Rate

	First-time	Repeat
❖ Architectural	66%	56%
❖ Chemical	73%	35%
❖ Civil	62%	32%
❖ Electrical and Computer	63%	28%
❖ Environmental	75%	33%
❖ Mechanical	72%	38%
❖ Naval Architecture and Marine Engineering	100%	67%
❖ Structural I	48%	25%
❖ Structural II	65%	36%
❖ Passing between 55% - 60% correct		

FE Morning Session Format



- | | | | |
|---|-----|--------------------------------|-----|
| ❖ Mathematics | 15% | ❖ Engineering | |
| ❖ Engineering Probability
and Statistics | 7% | Mechanics | 10% |
| ❖ Chemistry | 9% | ▪ A. Statics | 6% |
| ❖ Computers | 7% | ▪ B. Dynamics | 4% |
| ❖ Ethics and
Business Practices | 7% | ❖ Strength of Materials | 7% |
| ❖ Engineering
Economics | 8% | ❖ Material Properties | 7% |
| | | ❖ Fluid Mechanics | 7% |
| | | ❖ Electricity and
Magnetism | 9% |
| | | ❖ Thermodynamics | 7% |



Morning Session Format

❖ Mathematics	18	❖ Engineering	
❖ Engineering Probability and Statistics	8	Mechanics	12
❖ Chemistry	11	■ A. Statics	7
❖ Computers	8	■ B. Dynamics	5
❖ Ethics and Business Practices	8	❖ <i>Strength of Materials</i>	8
❖ Engineering Economics	10	❖ <i>Material Properties</i>	8
		❖ <i>Fluid Mechanics</i>	8
		❖ Electricity and Magnetism	11
		❖ Thermodynamics	8



My Study Plan

❖ Jan

- *Practice Test and Evaluate*
- Mathematics
- Engineering Probability and Statistics
- Chemistry

❖ Feb

- Electricity and Magnetism
- Thermodynamics
- Engineering Economics

❖ March

- Ethics and Business Practices
- Engineering Mechanics
- Computers

❖ April

- *Strength of Materials*
- *Material Properties*
- *Fluid Mechanics*
- *Practice Test and Review*

Guess or Leave Blank



- ❖ Always guess!
- ❖ No points are subtracted for incorrect answers
- ❖ Your first (educated) guess is usually the best (eliminate obvious wrong answers)
- ❖ Leave time at the end of the exam to go back and fill in bubbles for questions you skipped.
- ❖ ***Play The Odds***

One to three months before



- ❖ Get to know the reference book.
- ❖ Practice test – practice test – practice test
 - type problems under test conditions.
 - In whole or in pieces
- ❖ Take a practice test, all at once or in pieces.
- ❖ Determine where you can improve the most with the least amount of effort.
- ❖ Decide which afternoon section you will take



The night before

- ❖ **Lessen stress by**
 - review if you like - but no new concepts
 - do something easy and fun that won't keep you up late
 - organize your supplies for morning:
 - pencils, calculator, food, comfortable clothes, two alarms or arrange for a friend to call, etc.
- ❖ **get your sleep both the night before and two nights before the test - treat this test like a marathon**



Day of

- ❖ don't talk about the test
- ❖ ask the proctor for clarification if you need it
- ❖ don't burn too much time on any one question
- ❖ draw pictures, diagrams, etc. to help you think
- ❖ do your best - think positively!



Other Strategies

- ❖ Know the test routine, know the reference book
- ❖ Anticipate the answer before reading choices
- ❖ Watch out for qualifiers (but, except, always, never, not, only, must, etc.)



Other Strategies (cont.)

- ❖ Answer all questions!!!
- ❖ Keep tabs on the time
- ❖ Come up for air
- ❖ Snack quietly (pre-open wrappers, sodas, etc.)
- ❖ Don't leave early



General Advice

- ❖ Identify essential reference books
- ❖ Know code (year/edition) for civil or structural exam that are specified for the exam,
- ❖ Check library for books to borrow vs. buy
- ❖ seek friends/coworkers for borrowed books
- ❖ Assemble past textbooks, class notes, Schaum's outlines, etc.
- ❖ Seek out and accumulate practice or sample exams, available from PPI and others.



General Advice (cont.)

- ❖ Decide on a calculator. Have manual; extra batteries and know how to use it; and spare 2-3. Label all calculators, books, etc. brought to exam.
- ❖ Make a review schedule with time for all subjects to be studied.
- ❖ Add book tabs, etc. during review. Check on state rules.
- ❖ Have own system to assemble/organize materials during review.
- ❖ Take practice exam close to date to evaluate readiness & work on weaknesses.

Other Prep Strategies



- ❖ Know weaknesses in your strong areas, study those area and work more practice problems.
- ❖ Timed practice exam
 - Gives you more practice
 - Find out how well you perform under pressure



Other Exam Strategies

- ❖ Work all the problem areas you know best, and so on.
- ❖ Don't waste time trying to work problems you really should just guess at.
- ❖ Save your time for those that you actually have a fighting chance of getting right.
- ❖ Work on areas you are comfortable with first, when you're fresh.



Other Exam Strategies

- ❖ Even though NCEES says they provide pencils, at my exam site they ran out! So be sure to bring your own, as a backup.
- ❖ Bring lunch from home, with a beverage! Don't rely on scrounging for food at the test site.
- ❖ Bring your own food and water. Make sure to wear a watch; they only call time twice, when you have 30 minutes left and when the test is over. Most importantly, relax and take it easy--you can't think clearly and panic at the same time.



Other Exam Strategies

- ❖ Avoid talking about the test over lunch--you may get upset by what you hear. Have something nice to eat from home and just relax. Keep negative thoughts out of your head.
- ❖ If you have to travel a long way, stay in a motel the night before. You need to be well-rested for this test.



Misconceptions

- ❖ It's possible to get copies of actual FE exams and problems to study.
- ❖ The FE exam is biased toward some disciplines
- ❖ The FE exam is very difficult.
- ❖ I've been out of school too long to take this exam. I've forgotten everything.
- ❖ I'd have to study for a year to prepare adequately for this exam.



Misconceptions (cont.)

- ❖ The FE exam has (1) proofs, (2) derivations, (3) lots of higher-level math, and (4) questions on non-engineering subjects such as accounting, economics, and psychology.
- ❖ I never had a course in thermodynamics (or dynamics, or electricity, etc.), so I'm doomed.
- ❖ I don't need to prepare for the FE exam.
- ❖ Only civil engineers need to take the FE exam to advance their careers.
- ❖ The FE is an open-book exam.



Resources

❖ The Passing Zone (PPI 2 Pass)

- ppi2pass.com
- More than the books and services – there are tips and a forum
- Personally was beneficial to Carles and Thzaira – this is not an endorsement

❖ NCEES

- ncees.org



QUESTIONS?