

**FUNDAMENTALS OF ENGINEERING REVIEW  
SERIES**

**HOSTED BY**

**COLLEGE OF ENGINEERING  
OFFICE OF CONTINUING EDUCATION**

**TEXAS A&M UNIVERSITY**

**COLLEGE STATION, TEXAS  
JANUARY 1998**

**There will be approximately 30 hours of video tapes provided in this review series. Each topic on the FE is important, but not all topics have the same number of questions on the exam. Therefore, we have structured the reviews to provide more material on the topics that have the greatest weighting on the exam.**

## **VIDEO TAPES - 31 HOURS**

**Introduction - 1 hour**

**Math - 3 hours**

**Thermo - 3 hours**

**Statics - 3 hours**

**Dynamics - 3 hours**

**Strength of Materials - 3 hours**

**Engineering Economics - 2 hours**

**Engineering Ethics - 1 hour**

**Electrical Engineering - 3 hours**

**Study Strategies - 1 hour**

**Chemistry - 2 hours**

**Materials Science - 2 hours**

**Computers and Numerical**

**Methods - 1 hour**

**Fluid Mechanics - 3 hours**

## **WHO WILL PRESENT THE REVIEW SERIES**

- 1. General Introduction to Fundamentals (1 hour) - Dan Turner**
- 2. Thermodynamics (3 hours) - Dan Turner**
- 3. Strategies for Taking the FE (1 hour) - Karen Butler**
- 4. Ethics (1 hour) - Charles Harris**
- 5. Strength of Materials ( 3 hours) - Lee Lowery**
- 6. Engineering Economics (2 hours) - Lee Lowery**
- 7. Statics (3 hours) - Lee Lowery**
- 8. Dynamics (3 hours) - Ray James**
- 9. Mathematics (3 hours) - John Weese**
- 10. Computer and Numerical Methods (1 hour) - Bill Batchelor**
- 11. Chemistry (2 hours) - Mark Holtzapple**
- 12. Electrical Circuits (3 hours) - John Tyler**
- 13. Materials Science (2 hours) - Richard Griffin**
- 14. Fluid Mechanics (3 hours) - Ralph Wurbs**

## **BENEFITS OF BECOMING A P.E.**

- **Consulting**
- **Added job opportunities**
- **Promotions**

# **PE Licensure**

## **FE - 1st Exam in the Process**

**After passing the FE, obtain the  
necessary experience as an  
engineering intern**

**P&P (Principles & Practices Exam) -  
2nd exam in the process**

# **REGULATIONS FOR BECOMING A P.E.**

- Governed by State Registration**

**Boards of each state and U. S.**

**Territories**

- Requirements vary by State, but  
virtually all require passage of the FE  
and P&P**

# **TYPICAL STATE REQUIREMENTS**

- Graduate from an ABET-accredited, four year or five year program in engineering**
- Passage of FE**
- Obtain four or more years of applicable engineering experience**
- Pass the P&P exam**
- Ability to obtain registration in other state by reciprocity**



# **EXAM ADMINISTRATION**

**The National Council of Examiners  
for Engineering and Surveying  
(NCEES) is the exam administrator.  
Volunteers from all over the U. S. help  
write the exams.**

**NCEES Address:**

**National Council of Examiners  
for Engineering and Surveying  
P. O. Box 1686  
Clemson, South Carolina  
29633-1686  
Phone: (864) 654-6824**

# **Fundamentals of Engineering Exam**

Note: Check NCEES website for latest information about FE content and format; <https://ncees.org/engineering/fe/>

- **8 Hours Long**
- **Morning Session**
  - **120 problems**
  - **multiple choice**
  - **12 subject areas**
- **Afternoon Session**
  - **60 problems**
  - **multiple choice**
  - **discipline specific - Chemical, Civil, Electrical, Industrial, Mechanical, and General**

# **STATISTICS ON THE FE/EIT EXAM**

- Approximately 40,000 take the FE exams each year**
- Exams are given in April and October (generally)**
- Pass rate is about 70% for all test takers**
- Pass rate is above 80% for students graduating from ABET-accredited engineering programs**

## **PASSING SCORE**

- **About 50%, i.e., a raw score of 120 pts. is generally enough to get you a scaled score of 70, the minimum passing point.**
- **Morning and afternoon points are added together.**

## Fundamentals of Engineering Examination Format

### Morning Portion

Four Hours

<u>Subjects Covered</u>	<u>Number of Problems</u>	<u>Subjects Covered</u>	<u>Number of Problems</u>
Chemistry	11	Materials Science/ Structure of Matter	8
Computers	6	Ethics	5
Dynamics	10	Mathematics	24
Engineering Economics	5	Mechanics of Materials	8
Electric Circuits	12	Statics	12
Fluid Mechanics	8	Thermodynamics	11

There are a total of 120 problems in the morning portion of the examination. Work all 120 problems.

# Fundamentals of Engineering Examination Format

## Afternoon Portion

Four Hours

### GENERAL

Chemistry	5
Computers	3
Dynamics	5
Electrical Circuits	6
Engineering Economics	3
Ethics	3
Fluid Mechanics	4
Material Science/Structure of Matter	3
Mathematics	12
Mechanics of Materials	4
Statics	6
Thermodynamics	6

# Fundamentals of Engineering Examination Format

## Afternoon Portion Four Hours

### ELECTRICAL

Analog Computer Circuits	6
Communications Theory	6
Computer & Numerical Methods	3
Computer Hardware Engineering	3
Computer Software Engineering	3
Control Systems Theory & Analysis	6
Digital Systems	6
Electromagnetic Theory & Applications	6
Instrumentation	3
Network Analysis	6
Power Systems	3
Signal Processing	3
Solid State Electronics & Devices	6

# Fundamentals of Engineering Examination Format

## Afternoon Portion Four Hours

### CHEMICAL

Chemical Reaction Engineering	6
Chemical Thermodynamics	6
Computer & Numerical Methods	3
Heat Transfer	6
Mass Transfer	6
Material/Energy Balances	9
Pollution Prevention	3
Process Control	3
Process Design & Economics Evaluation	6
Process Equipment Design	3
Process Safety	3
Transport Phenomena	6



# Fundamentals of Engineering Examination Format

## Afternoon Portion Four Hours

### MECHANICAL

Automatic Controls	3
Computers	3
Dynamic Systems	6
Energy Conversion & Power Plants	3
Fans, Pumps, & Compressors	3
Fluid Mechanics	6
Heat Transfer	6
Material Behavior/Processing	3
Mechanical Design	6
Refrigeration & HVAC	3
Stress Analysis	6
Thermodynamics	6
Instrumentation and Measurements	6

## Fundamentals of Engineering Examination Format

### Afternoon Portion Four Hours

#### CIVIL

<b>Computer &amp; Numerical Models</b>	<b>6</b>
<b>Construction Management</b>	<b>3</b>
<b>Environmental Engineering</b>	<b>6</b>
<b>Hydraulics &amp; Hydrologic Systems</b>	<b>6</b>
<b>Legal &amp; Professional Systems</b>	<b>3</b>
<b>Soil Mechanics &amp; Foundations</b>	<b>6</b>
<b>Structural Analysis</b>	<b>6</b>
<b>Structural Design</b>	<b>6</b>
<b>Surveying</b>	<b>6</b>
<b>Transportation Facilities</b>	<b>6</b>
<b>Water Purification &amp; Treatment</b>	<b>6</b>

**Fundamentals of Engineering Examination Format**

**Afternoon Portion**

**Four Hours**

**INDUSTRIAL**

<b>Computer &amp; Numerical Methods</b>	<b>3</b>	<b>Design of Industrial Experiments</b>	<b>3</b>
<b>Engineering Economics</b>	<b>3</b>	<b>Engineering Statistics</b>	<b>3</b>
<b>Facility Design &amp; Location</b>	<b>3</b>	<b>Industrial Cost Analysis</b>	<b>3</b>
<b>Industrial Ergonomics</b>	<b>3</b>	<b>Industrial Management</b>	<b>3</b>
<b>Information System Design</b>	<b>3</b>	<b>Manufacturing Processes</b>	<b>3</b>
<b>Manufacturing Systems Design</b>	<b>3</b>	<b>Material Handling System Design</b>	<b>3</b>
<b>Mathematical Optimization &amp; Modeling</b>	<b>3</b>	<b>Production Planning &amp; Scheduling</b>	<b>3</b>
<b>Productivity Measurement &amp; Management</b>	<b>3</b>	<b>Queuing Theory &amp; Modeling</b>	<b>3</b>
<b>Simulation</b>	<b>3</b>	<b>Statistical Quality Control</b>	<b>3</b>
<b>Total Quality Management</b>	<b>3</b>	<b>Work Performance &amp; Methods</b>	<b>3</b>

## **Supplied Reference**

**The NCEES changed to a closed book, supplied reference format four years ago. The discipline-specific materials are included in the supplied reference as well. It is very important that you use the supplied reference in your preparation for the exam and know where materials are located, i.e., ME material is included in several different sections. You do not want to waste time searching for formulas during the exam.**

**Very Important!**

# **SUPPLIED REFERENCE:**

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**NATIONAL COUNCIL OF EXAMINERS  
FOR ENGINEERING AND SURVEYING**

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**FUNDAMENTALS OF  
(FE)  
DISCIPLINE SPECIFIC  
REFERENCE HANDBOOK**

Second Printing, September 1996

**National Council of Examiners for Engineering and Surveying  
(NCEES)  
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864-654-6824  
[www.ncees.org](http://www.ncees.org)**

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# **SUPPLIED REFERENCE**

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## **PREPARATION FOR THE FE**

- 1. Become familiar with the Supplied Reference that you will use in the exam.**
- 2. Take the sample exams available from NCEES or various study books, and determine your areas of greatest strength (and greatest weakness!)**
- 3. Set a goal of 60% competency (60% of questions answered correctly) on the sample exams.**

**(Remember: Passing scores are roughly 50%, i.e., 120 points out of 240 total points.)**

## **HOW TO TAKE THE EXAM**

- 1. Start with the subject areas you are strongest in, and work from strength to weakness.**
- 2. Do not spend more than 3 minutes on any morning question or 5 minutes on a p.m. question (unless you are on the verge of a solution!).  
Go on to the next question and come back to this one.**

**3. About 15 minutes before the end of the session, go back to any questions you have skipped and spend about 10 minutes trying to answer questions.**

**4. At the 5-minute mark, fill in all unanswered questions. Go ahead and guess. There is no penalty for wrong answers! Make sure your multiple choice answer sheet is marked correctly.**