Professional Engineers
of Colorado

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Principles and Practice of Engineering
Civil BREADTH Exam Review

Instructor Information

Colorado is one of several states that is hoping to offer a PE exam review course for the civil engineering exam this fall. The review course has been developed by NSPE and Kaplan AEC Education and we anticipate adding additional disciplines in the future.

PEC Instructor Specifications: Ideally, we would like a P.E. who could be the 'lead' instructor and teach one or two of the required sections and who could also coordinate delivery of the other parts with other instructors.

Review Session Schedule/Sessions

***Below is a breakdown of subject matter within each instructor session; please complete the application found on the last page of this packet.**

Saturday, August 2, 2008 - **Construction (Part 1)**
Saturday, August 9, 2008 - **Construction (Part 2)**
Saturday, August 16, 2008 - **Geotechnical (Part 1)**
Saturday, August 23, 2008 - **Geotechnical (Part 2)**

Saturday, September 6, 2008 - **Structural (Part 1)**
Saturday, September 13, 2008 - **Structural (Part 2)**
Saturday, September 20, 2008 - **Transportation**
Saturday, September 27, 2008 - **Water Resources & Environmental (Part 1)**

Saturday, October 4, 2008 - **Water Resources & Environmental (Part 2)**
Saturday, October 11, 2008 - **Water Resources & Environmental (Part 3)**

- The commitment will be for approximately 4-6 hours of instruction a week (Saturday mornings) depending on how many subject areas you are selected to teach. PEC has provided a 4-hour time block for each session beginning at 8:00 a.m. through 12:00 p.m. Instructors should review the course materials and notify the PEC office if this is not enough time in order to make schedule adjustments.
- Instructors will be provided with a resource guide, learning objectives, timed outlines, sample exams, and PowerPoint presentations. Instructors will also be able to participate in an on-line training session just for instructors teaching the course.
- Additionally, PEC will compensate each instructor **$150.00 per day of instruction**. All instructor payments will be mailed after the scheduled review session.

***REVIEW LOCATION:** The review will be located in the Denver area. All speakers will be notified of the location as soon as it has been established.

Please submit the application found on the last page of this packet along with a copy of your resume to the PEC office by Friday, April 18th, if you are willing to assist PEC in this exciting new program.

National Council of Examiners for Engineering and Surveying
Principles and Practice of Engineering Civil BREADTH Exam Specifications
Effective Beginning with the April 2008 Examinations

I. CONSTRUCTION 20%

A. Earthwork Construction and Layout
   i. Excavation and embankment (cut and fill)
   ii. Borrow pit volumes
   iii. Site layout & control
B. Estimating Quantities and Costs
   i. Quantity take-off methods
   ii. Cost estimating
C. Scheduling
   i. Construction sequencing
   ii. Resource scheduling
   iii. Time-cost trade-off
D. Material Quality Control and Production
   i. Material testing (e.g., concrete, soil, asphalt
E. Temporary Structures
   i. Construction loads

II. GEOTECHNICAL 20%

A. Subsurface Exploration and Sampling
   i. Soil classification
   ii. Boring log interpretation (e.g., soil profile)
B. Engineering Properties of Soils and Materials
   i. Permeability
   ii. Pavement design criteria
C. Soil Mechanics Analysis
   i. Pressure distribution
   ii. Lateral earth pressure
   iii. Consolidation
   iv. Compaction
   v. Effective and total stresses
D. Earth Structures
   i. Slope stability
   ii. Slabs-on-grade
E. Shallow Foundations
   i. Bearing capacity
   ii. Settlement
F. Earth Retaining Structures
   i. Gravity walls
   ii. Cantilever walls
   iii. Stability analysis
   iv. Braced and anchored excavations

III. STRUCTURAL 20%

A. Loadings
   i. Dead loads
   ii. Live loads
   iii. Construction loads
B. Analysis
   i. Determinate analysis
C. Mechanics of Materials
   i. Shear diagrams
   ii. Moment diagrams
   iii. Flexure
   iv. Shear
   v. Tension
   vi. Compression
   vii. Combined stresses

viii. Deflection

D. Materials
   i. Concrete (plain, reinforced)
   ii. Structural steel (structural, light gage, reinforcing)

E. Member Design
   i. Beams
   ii. Slabs
   iii. Footings

IV. TRANSPORTATION **20%**

A. Geometric Design
   i. Horizontal curves
   ii. Vertical curves
   iii. Sight distance
   iv. Superelevation
   v. Vertical and/or horizontal clearances
   vi. Acceleration and deceleration

V. WATER RESOURCES AND ENVIRONMENTAL **20%**

A. Hydraulics – Closed Conduit
   i. Energy and/or continuity equation (e.g., Bernoulli)
   ii. Pressure conduit (e.g., single pipe, force mains)
   iii. Closed pipe flow equations including Hazen-Williams, Darcy-Weisbach Equation
   iv. Friction and/or minor losses
   v. Pipe network analysis (e.g., pipeline design, branch networks, loop networks)
   vi. Pump application and analysis

B. Hydraulics – Open Channel
   i. Open-channel flow (e.g., Manning's equation)
   ii. Culvert design
   iii. Spillway capacity
   iv. Energy dissipation (e.g., hydraulic jump, velocity control)
   v. Stormwater collection (e.g., stormwater inlets, gutter flow, street flow, storm sewer pipes.)
   vi. Flood plains/floodways
   vii. Flow measurement – open channel

C. Hydrology
   i. Storm characterization (e.g., rainfall measurement and distribution)
   ii. Storm frequency
   iii. Hydrographs application
   iv. Rainfall intensity, duration, and frequency (IDF) curves
   v. Time of concentration
   vi. Runoff analysis including Rational and SCS methods
   vii. Erosion
   viii. Detention/retention ponds

D. Wastewater Treatment
   i. Collection systems (e.g., list stations, sewer networks, infiltration, inflow)

E. Water Treatment
   i. Hydraulic loading
   ii. Distribution systems

TOTAL: **100%**

Notes:
The examination is developed with questions that will require a variety of approaches and methodologies including design, analysis, and application. Some questions may require knowledge of engineering economics.

The knowledge area specified under 1, 2, 3, etc., are examples of kinds of knowledge, but they are not exclusive or exhaustive categories.

The breadth (AM) exam contains 40 multiple-choice questions. Examinee works all questions.

Score results are combined with depth exam results for final score.

Professional Engineers of Colorado

PE Exam Review - Instructor Application

Please complete the following form and submit to the address noted below. Please be sure to include a copy of your resume for review. The PEC Professional Development Committee will review applications and notify all instructors of the selection by **Friday, April 25, 2008.**

Name: _____

Company: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

***Please attach a copy of your resume**

Please select the review session date and discipline you are interested in instructing:

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Once all applications have been received and a selection has been made, an instructor contract will be mailed directly to you containing more detailed information and resource guides for instructing.

Thank you for your support!

Jack Gianola, P.E.
Professional Development Committee Chair
Professional Engineers of Colorado

Please submit application to:
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Westminster, CO 80031
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