For PDH Credit, Go To --

www.aisc.org/conferencepdh

Course ID for this session is

GR55S

(Number of PDHs = 1.0)
COMPETENCY

of the Civil Engineering Professional of Tomorrow

Discussed with the Engineering Professionals Participating in the --

2010 Structures Congress
Orlando, Florida – May 13, 2010

Jeff Russell, P.E., Ph.D., Dist.M.ASCE (Chair)
Tom Lenox, Ph.D., M.ASCE (Staff Leader)
Committee on the Academic Prerequisites for Professional Practice (CAP^3)
Preparing CE’s for The Future

Entrusted by society to create a sustainable world and enhance the global quality of life, civil engineers serve competently, collaboratively, and ethically as master:

- planners, designers, constructors, and operators of the built environment
- stewards of the natural environment
- integrators of ideas and technology
- managers of risk and uncertainty
- leaders in shaping policy
BLUF -- Why We Must Act!

1. BOK has expanded due to --
   • Complexity of professional practice.
   • Globalization.

2. Expanded BOK requires more preparation to protect public’s health, safety, & welfare.

And the baccalaureate engineering degree has been changing . . . . . . .
The “Bottom Line”
Problem Statement

“It is evident that the exploding body of science and engineering knowledge cannot be accommodated within the context of the traditional four year baccalaureate degree.”

Educating the Engineer of 2020
NAE Report 2005
And the engineering degree has been changing . . .

![Graph showing the decrease in credits required for an engineering degree over time.]
A Leader No Longer

Years of Formal Education

1900 1920 1950 1980 2000 2010

Engineering

Engineering Technology

Occupational Therapy

Architecture

Accounting

Pharmacy

Law

Medicine
What Are We Doing?
Preparing for Our Future

Entrusted by society to create a sustainable world and enhance the global quality of life, civil engineers serve competently, collaboratively, and ethically as master:

- planners, designers, constructors, and operators of the built environment
- stewards of the natural environment
- integrators of ideas and technology
- managers of risk and uncertainty
- leaders in shaping policy
The American Society of Civil Engineers supports *the attainment of a Body of Knowledge* for entry into the practice of civil engineering at a professional level.
Fulfillment of this BOK will include --

1. a baccalaureate degree in CE

2. a master’s degree, or approx 30 graduate or upper level technical and/or professional practice credits . . .

3. appropriate experience . . .

B + (M or 30) & E
Vision for Civil Engineering in 2025

Master Plan

Laws/Rules of 56 Licensing Boards

Future-Focused
Comprehensive
Aspirational
Strategic
Integration of Paraprofessionals

NCEES Model Rules

Primary Input
Key Influence

NCEES Model Law

Educational Fulfillment

Vision for Civil Engineering in 2025

Civil Engineering Body of Knowledge (including guidelines for B vs M/30 vs E)

Accreditation Criteria

Fulfillment
How Are We Doing?
ASCE’s Dynamic Strategy Management

Strategic Issue
(the motive to act)

Desired Outcomes
(conditions that will exist when favorably resolved)

Guiding Principles
(parameters placed on the strategy managers)

Actions
(required to achieve these outcomes)
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<td>1.</td>
<td>Develop, update a CE Body of Knowledge (BOK)</td>
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<td>2.</td>
<td>Translate the BOK into accreditation criteria</td>
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<td>3.</td>
<td>Influence CE academic programs to reflect BOK</td>
<td>On track</td>
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<td>4.</td>
<td>Develop experience guidelines to reflect BOK</td>
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<td>5.</td>
<td>Influence NCEES to amend the Model Law</td>
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## Competency Strategy

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We Need YOU To --

- Become Informed – Stay Informed
- Provide Input (by July 1st) to --
  - Body of Knowledge (BOK2)
  - Experiential Guidelines to BOK2

Influence Stakeholders
- Licensing Board
- Universities (Civil Engineering departments)
- Leaders of Local Firms
- Local NSPE
- State ACEC

www.asce.org/raisethebar/reports
Information and Knowledgeable Points of Contact

www.asce.org/raisethebar

If you have questions or comments, please contact

Jeff Russell 608.262.7244 russell@engr.wisc.edu
Ken Fridley 205-348-6550 kfridley@eng.ua.edu
Tom Lenox 800.548.2723 tlenox@asce.org
Discussion
Slides: In Reserve for Possible Use During Q/A
Percentage of PE exam takers by engineering discipline for the past five years

(Miller, T., NCEES Dir. of Examination Services, personal communication, June 29, 2009)

* Effective Not Earlier Than January 1, 2020 in any licensure jurisdiction.
To Be an **Engineer Intern (EI)** --

B\(^{ABET}\) + FE Exam

or

B + M\(^{ABET}\) + FE Exam

*Model Law Section 130.10 (2020)*
To Take Professional Engineer (PE) Exam, you must be Engineer Intern (EI) and

\[ M^{ENRG} + \text{Experience} \]

or

\[ M^{ABET} + \text{Experience} \]

or

“+30” + Experience
And what is the +30?

- 30 credits of courses equivalent in rigor to upper-level undergraduate or graduate courses.
- At least 15 credits in engineering (ALL 30 credits can be in engineering!).
- Remainder of credits can include science, math, and/or professional practice topics (such as business, communications, contract law, management, ethics, public policy, & quality control)
- From “approved course providers.”
Who are “approved course providers?”

- Institution with EAC/ABET programs.

- Institution/organization accredited by an NCEES-approved accrediting body.

- Institution/organization that offers specifically approved courses approved by an NCEES-approved accrediting body.
Information and Knowledgeable Points of Contact

If you have questions or comments, please contact

Jeff Russell   608.262.7244   russell@engr.wisc.edu
Ken Fridley    205-348-6550   kfridley@eng.ua.edu
Tom Lenox      800.548.2723   tlenox@asce.org
Chairman John Hennessy outlined the Council's concerns:

“We believe that the "Plus 30" would be better incorporated within the basic Bachelor's degree; that if the proposal were enacted in some states and not in others, there would be a serious comity problem; that the proposal would likely exacerbate the engineer shortage; and that it would not enhance the image of the profession.”

An ACEC Executive Committee resolution stated that the initiative is “not the most effective approach to promoting engineering professionalism.”

ACEC opposes the Bachelor's Plus 30 initiative; little support found among members.

The "Bachelor's Plus 30" initiative proposed by the National Council of Examiners for Engineering and Surveying (NCEES) has found little support among ACEC state Member Organizations, Executive Committee and Board of Directors.

The proposal, which was considered in depth by ACEC over the past year, would require a bachelor's degree plus 30 additional credits or master's degree as a prerequisite for licensure. NCEES proposed the initiative in 2006 and is seeking implementation by all states by 2015.

In a letter to NCEES President Gene Conley, ACEC Chairman John Hennessy outlined the Council's concerns: “We believe that the "Plus 30" would be better incorporated within the basic Bachelor's degree; that if the proposal were enacted in some states and not in others, there would be a serious comity problem; that the proposal would likely exacerbate the engineer shortage; and that it would not enhance the image of the profession.”

An ACEC Executive Committee resolution stated that the initiative is "not the most effective approach to promoting engineering professionalism."

The Council remains a strong supporter of NCEES and will continue to work with the organization in a wide range of areas to benefit the engineering community.

**INDUSTRY NEWS**

- **Failing Bridges Worry State and Local Governments**
- **New Wave of Nuclear Plants Facing Rider Struggles**
- **$8.4 Billion Proposed For School Renovations**
- **GSA Creates Green Building Compliance Arm**
- **DOE Takes Next Steps With Restructured FutureGen Approach**

**ACEC JOB BOARD**

**Spring Into Savings With ACEC Job Board**

With college graduations upon us, May is a great month to post your available positions on the ACEC Job Board.

Be one of the first 20 firms to post a job and save 25 percent on any posting package you choose. You must use the code SPRINGSAVE to receive your discount. Don't miss these big savings!

With over 600 posted A/E/C industry jobs and more than 8,000 candidate resumes, the ACEC Job Board's advanced search features produce effective, specific results for both job seekers and employers.

The ACEC Job Board saves you time and money by not returning the dozens (or even hundreds) of inappropriate results common with some mega job boards.

**Take ACEC Liability Insurance Survey Now; Deadline Extended To May 23**

The 2008 ACEC Professional Liability Insurance Survey of Member Firms for fiscal year 2007 is being extended online through Friday, May 23.

This annual survey collects information on Member Firms' professional liability insurance experience, including claims and the threat of litigation.

Member Firms that respond to the survey will receive a free copy of the complete results upon request. The survey results will also be available for sale through the ACEC Bookstore.

To access the survey, please click on the URL below or copy and paste it into your Web browser: http://www.surveymonkey.com/s.aspx?sm=KcZsqUEnN_2d0Y1mJ3F3Gcw_3d_3d

It is critical that ACEC receives only one response from each member firm. Therefore, only the key principal, risk manager, or another member of the firm designated by the key principal, should fill out this survey. In
Arguments Against This Change

- High school students are better prepared.
- BS curriculum is already too rigorous.
- Modern teaching resources promote efficiency.
- Shortage of engineers will be exacerbated.
- Costs will increase (for individual and/or employer).
- Experience is key . . . not more education.
- ABET can/will/should take care of this.
- Life long learning is the answer.
- Advances in the cognitive science will solve problem.
- Only licensed engineers are affected by solution.
Arguments For This Change

• Increased complexity of professional practice has increased BOK to enter profession.

• Globalization requires additional KSA to compete in the global market place.

• Expanding BOK requires additional education to protect public’s health, safety, & welfare.

• Other proposed solutions (to date) are not viable (e.g., ABET, experience, etc.).

• Doing nothing is not an alternative.
Top Ten Misconceptions

10. Implementation will occur instantly.
9. Current P.E.’s must obtain a “M or 30.”
8. The goal is to eliminate the 4-year degree.
7. Education is more important than Experience.
6. All CE undergraduates must pursue licensure.
5. “M/30” should follow directly after “B.”
4. Degrees (not knowledge) are the key.
3. “M” means traditional MS degree with thesis.
2. The current BSCE will not be changed.
1. We are working for faculty job security.
Information and Knowledgeable Points of Contact

If you have questions or comments, please contact

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