

University-Based Asphalt Materials and Flexible Pavements Education: Developing a Roadmap and Action Plan

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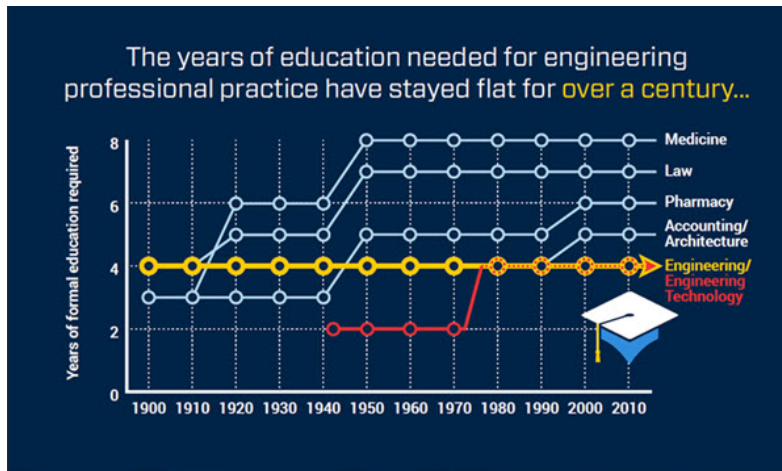
Our Chat Today...

- Curricular constraints at U.S. universities
- Personnel and resource challenges
- A pavement engineering “body of knowledge”?
- Potential solutions



Curricular Constraints

- State Mandates on Program Size (credit hours)
 - Push for retention/graduation, lower costs
 - Some states as low as 120 hours for BSCE



ASCE Raise the Bar



- General University “Core”
- State-Mandated “Core”



Curricular Constraints

- ABET

- General Criteria (Criterion 3, Outcomes “a” thru “k”)

- | | | |
|-------------------|----------------------------|-----------------------------|
| a) Math & Science | f) Ethics | k) Modern Engineering Tools |
| b) Experiments | g) Communications | |
| c) Design | h) Societal/global impacts | |
| d) Teamwork | i) Life-long Learning | |
| e) Engr Problems | j) Contemporary Issues | |

- Civil Engineering Program Criteria

The curriculum must prepare graduates to apply knowledge of mathematics through differential equations, calculus-based physics, chemistry, and at least one additional area of basic science; apply probability and statistics to address uncertainty; **analyze and solve problems in at least four technical areas appropriate to civil engineering**; **conduct experiments in at least two technical areas of civil engineering and analyze and interpret the resulting data**; **design a system, component, or process in at least two civil engineering contexts**; include principles of sustainability in design; explain basic concepts in project management, business, public policy, and leadership; analyze issues in professional ethics; and explain the importance of professional licensure.



Personnel and Resources

- Qualified faculty (or lack thereof)
 - Research mission
 - Funding sources; overhead constraints
 - Teaching loads
 - Inclusion of required and/or elective courses at UG level
 - 'Band width' for viable graduate program
- Resources
 - Textbooks / instructional materials
 - Laboratory space and equipment



A Body of Knowledge (BOK) for Flexible Pavement Engineering?

- Minimum 'exposure' to flexible pavements and materials – all CE undergraduates
- Content for an emphasis (selected electives) in flexible pavements
- Minimum content for pavement/materials based MS, PhD

General
Pavement
Life-Cycle

Design

Materials

Construction

Maintenance
and
Preservation

Rehabilitation

Associated
Topics

Capstone(?)

Sustainability

*Pavement
Management*

Airports



Potential Path(s) Forward...

- Professor Training
 - NCAT, AI, NHI, Industry
 - Short-course; webinars; videos; formal distance-ed
- Instructional Materials
 - Texts
 - Industry/Agency based guides, manuals, specifications
 - Online resources (i.e. *Pavement Interactive*, YouTube)
 - Shared online courses between universities
- Laboratory Resources
 - Industry/Agency/University partnerships
 - Shared / online 'virtual' laboratories



What Can the ETG Do?

- Remember, this is **outreach not research**
- Encourage establishment of resource repository
 - Funding
 - Updating
 - Oversight
 - Publicity
- Establish task force to come up with plan
- Coordinate with Academy of Pavement Scientists and Engineers (APSE)

