

***Evolution in the Engineering Curriculum:
Changes in the Technical Base***

Francis C. Moon

J. Ford Professor of Mechanical Engineering

Over the past 4 decades in engineering education several important changes have occurred in the curriculum:

- Decrease in overall courses and credit hours for BSE; from 150 -to less than 130 credit hours.
- Fewer common curriculum courses across the College
- Increase in Project - Based Engineering

Fewer Courses for the BS Engineering Degree

- Decrease in both number of courses and credit hours
- Decrease in # physics and chemistry courses
- Decrease in depth of technical courses [e.g. in MAE circa 1960 there were three courses required in thermodynamics; from 1980's to the present only one.]
- Increased demand for courses in ethics, biology, business related subjects, computer science, communication skills etc.
- Engineering curricula of foreign universities have greater technical content; e.g. Germany etc.

Project-Based Engineering Education

Up to 50% of MAE students participate in non-classroom projects.

Examples College-wide include:

- Concrete canoe
- FSAE race car
- Robo-Cup
- Hybrid Electric Car
- Moon buggy
- Kinetic Sculpture

Project-Based Engineering Education PBE

- Project-based engineering curriculum can help restore depth in technical knowledge on a “need to know” basis.
- At present the faculty has not formalized this style of education and is highly dependent on dedicated faculty advisors
- There is a need for College support in space, facilities and staff for Project-Based Engineering.
- How do we enhance the technical knowledge of non PBE students?
- Can we develop WEB Based sources of technical engineering knowledge outside of formal courses? **E.g. Cornell KMODDL web-site on kinematic mechanisms.**