Olin College:
Re-Engineering Engineering Education

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OSTO Workshop
The Brief History

1997 – F. W. Olin Foundation announces plan to start a new engineering college
2000 – Ground Breaking
2001 – The “Partner Year”
2002 (Fall) – First Curriculum
2006 (May) – First Graduation
2007 – ABET accreditation
Olin Facts

Undergraduate residential engineering education
No academic departments
No tenure
No tuition
Total enrollment of ~300
BS degrees in ECE, ME, Engr (in 4 years)
9-to-1 student/faculty ratio
Endowment ~ $500 million
Adjacent to Babson College and Wellesley College
Olin College

WHERE DO OLIN STUDENTS HAIL FROM?

District of Columbia: 1
Costa Rica: 1
Australia: 1

Hawaii: 10
Alaska: 1
Educational Principles

Applied, hands-on approach in which team-based project design is introduced in the first year.

Technical excellence combined with social responsibility.

A significant design experience in each year.

Curricular Continuum

- classes, research, clubs, community service, co-curriculars and “passionate pursuits”
Challenging the Assumptions

Real problems all have “right” answers

- Start with authentic, open-ended, team-based design projects

There are single-discipline problems

- Collaboration and multidisciplinary thinking throughout

Knowing must precede doing

- Engineering first – A broad first-year engineering experience
Assumptions Cont’d

Student choice compromises program strength
  • Student autonomy and choice sustain motivation

Entrepreneurship is an extra
  • Broadly define “opportunity assessment”

Four years is not enough to teach “it all”
  • Focus on life-long learning
Engagement is essential

Eric Peterson / The Livingston Enterprise
Input: The Students

Average GPA    4.36/4.0
Nat’l Merit    39%
Mid 50% SAT    Excellent
AP Scholars    53%
Men/Women      55%/45%
% “of color”   23%
The Curriculum

Lead with Engineering

• Engineering experience in the first year

Design Throughout the Experience

• A design experience in each year

Full-Year Capstone Experience

• The SCOPE program
First Year Engineering Experience

- Design Nature
- Engineering of Compartmental Systems
- Engineering of Distributed Systems
- Modeling and Simulation
Design Nature - Hoppers
Design Throughout

First-Year: Design Nature

Second-Year: User-Oriented Collaborative Design

Third-Year: Design Depth

Fourth-Year: SCOPE
Project-based learning increases in sophistication throughout a student’s 4 years at Olin, culminating in SCOPE, in which seniors engage in a significant engineering project under realistic time and financial constraints for an external client.
Industrial Sponsors
Class of 2006 graduates:
- 3% Fulbright Scholars
- 6% NSF Fellows
- Grad schools & Jobs:
  + >20% to MIT, Stanford, Berkeley, HBS, Oxford
  + also law, medical and theology schools
  + hired at IBM, Intel, Boeing, Raytheon
  + several successful entrepreneurs
NSSE: Olin ranked in top 5% in all five key indicators of student engagement

Photo: May 2006
Output: The Graduates

Graduate School (30%)
Stanford, MIT, Caltech, Berkeley, Cornell, CMU, Rice
Oxford (Physics), Babson, Harvard (Bus), MD-PhD, Law
Fulbright (2), NSF Doctoral Fellows (4)
IBM, Raytheon, Google, Yahoo, Boeing
Entrepreneurs (10%)
OSTO Alumni

Bluefin Robotics

iRobot

Woods Hole Oceanographic Institution
  • SSSG
  • Acomms Group
  • Joint Program (MIT)

Semester at Sea (SEA)
Conclusions

Some of our objectives and techniques are new, but each has history.

Olin is an Experiment

- Will we be successful if we educate 75 excellent young engineers each year?
- We take requests!