Educating Leaders for the Emerging Global Economy

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Task Force Process

- One faculty face-to-face meeting to refine the task force charge and understand what "educating leaders" was about
- Three two-hour teleconferences with various overlapping participation of task force members
- Some background readings on B-school "leadership programs", Management of Technology program

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High Stakes in Higher Education: California's Competitiveness Starts with Research Universities

- **UC President Robert Dynes**
  SF Chronicle, 16 April 2004:
  - "When it comes to teaching students, UC provides much more than book learning. A UC education really is about teaching the next generation how to be innovative, creative, and competitive—how to take risks, learn from mistakes, and build on them. Those characteristics are the fundamental underpinning of the California economy and the key to its future."

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Observations about Typical Engineering Programs

- Focus on taking as many "difficult" technical courses as possible
- Limited time/energy left for broadening one's education
- Little exposure to the business environment within which most students will pursue their careers
- Little understanding of the product development cycle

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Statement of the Problem

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  - Today's engineering students are trained to develop technology but are left unprepared to assume management and executive positions given their current undergraduate experiences. Their greatest strengths are in problem solving, but they need better awareness of how to apply these skills to broader problems in more general contexts. Social integration skills—the ability to work effectively in and to lead interdisciplinary teams—need better development. While leadership cannot be taught—it is learned by doing—yet there are knowledge and experiences students can and should acquire to better prepare them for business leadership and career success in the emerging new world economy.

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Desired Activities and Experiences

- Exposure to "applications-oriented" engineering and the practice of engineering outside the classroom:
  - Case studies that illustrate the process of linking business or applications needs to technologies and systems that can satisfy those needs;
  - Experience as participants in interdisciplinary project/product teams, spanning the processes of design, implementation, and evolution;
  - Greater awareness of global cultures and the world economy;
  - Greater awareness of career options and how engineers' careers typically evolve over their lifetimes;
  - Practical work experiences through summer internships;
  - Integration of career skills development (e.g., communications and presentations, project group experience, finding mentors and role models) in technical curriculum

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Possible Approaches

- Application-oriented case studies courses (some of these already exist in the Management of Technology program at Berkeley);
- More project team courses, or projects that span courses (e.g., CS Software Engineering courses, where team is led by an MBA student);
- Appropriate course selections from the social sciences (economics, political science) and humanities (world cultures);
- Speaker series that bring successful business and political leaders with an engineering background to campus for lectures and meetings with students;
- Greater emphasis on formulating effective internships (e.g., the EECS Internship Program can be extended to the College of Engineering);
- As part of ABET Course Objectives and Outcomes, integrate business and leadership skills acquisition with the course curriculum (e.g., reports and public presentations as part of technical course activities rather than teaching "communications" as a standalone course).

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Task Force Recommendations

- Leadership
  - Review undergraduate admissions preferences to select for students with greater leadership potential and a willingness to take risks in their studies.
  - Encourage students to accept non-classroom roles that develop leadership and communication skills in order to enhance their own self-confidence (e.g., tutoring other students, teaching, and volunteering such as helping with IT and computing literacy in the local public schools). Facilitate such opportunities within the university and in collaboration with the local community with the support of the College's undergraduate staff and student organizations.

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Task Force Recommendations

- Programs
  - Establish a five-year B.S./M.S. engineering program with enhanced emphasis on interdisciplinary design experiences and business awareness. As appropriate to the discipline within engineering, structure the program to balance between a traditional deep "technical track" and an alternative technically focused business track. The extra time in such a program should be used to allow the student to acquire breadth and understanding of the practice of the business world, as well as technical foundations. Charter a college-wide faculty committee, coordinated with subcommittees within specific departments and programs, to develop specific five-year programs.

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Task Force Recommendations

- Curriculum
  - Organize a business case-directed course to instruct every engineering student in the foundations of financial literacy while developing an understanding and appreciation of the "business ecosystem" of management, finance, marketing, sales, operations, product development, and engineering.
  - Recognize the increasing importance of the global economy and non-American centered cultures, by formulating suggested course recommendations in the social sciences (economics, political science, public policy) and humanities (world cultures) to educate students to be knowledgeable and responsible world citizens.
  - Through the ABET requirement to document Course Objectives and Outcomes, integrate business and leadership skills acquisition throughout the course curriculum, such as embedding reports and public presentations as part of technical course activities. List course objectives and outcomes on departmental websites to assist students in making informed course choices.

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Task Force Recommendations

- Culture
  - Evolve the "engineering ethos" to value leadership in public service and the practice of business through well-publicized speaker series and the integration of these concepts within the curriculum.
  - Encourage effective internships and opportunities for educational exchange and study abroad, to integrate educational, industrial, and world cultural experiences.

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