

The Industrial Engineering and Operations Research Undergraduate Program

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Agenda

- A little bit about what is IE and OR, and what our graduates do
- The BS program in IEOR

What is IE?

- Industrial Engineering is *management-level engineering*
- Design of production, logistics and financial systems
 - How many machines and goods, how many people, what arrangement, what schedule, what procedures, what financing
- Engineering analysis to improve quality, productivity and customer service of existing systems

What is OR?

- Operations research is the scientific and mathematical analysis of business operations aimed at making them more efficient and more profitable
- OR involves the development of *mathematical models* of real-world operations, and analysis of those models in order to improve the operations

Where do IEOR graduates work?

- Large corporations, consulting firms and engineering firms have staff trained in IE and OR
- But new companies and small companies typically don't
 - Some IEOR graduates go to work in such companies or go into business for themselves as consultants to help such companies

What skills do IEORs possess?

- Mathematics (calculus, matrix algebra), as much as an applied math major
- Statistics and probability
- General engineering skills (physics, chemistry, materials, circuits, computer programming)
- Ability to rapidly comprehend real operations
- Good communication and leadership skills

U C Berkeley IEOR

- Ranked in top 3 IEOR departments in USA
- 13 faculty doing both teaching and research
- 50 BS degrees per year, 25 MS degrees per year, 7 PhD degrees per year
- Average starting salaries: BS \$60K, MS \$80K, PhD \$100K

The Eng BS program in IEOR

- The first two years (“lower division”) mostly consist of general engineering preparation in math, science, computer programming, humanities/social studies
- The last two years (“upper division”) mostly consist of specialized IEOR courses
- Issue: Do community college transfer students have what is needed?

Freshman Year

- 2 Reading and composition courses
- Math 1A, 1B (Calculus)
- Physics 7A (Mechanics)
- Chemistry or other science
- E7 (Computer programming)
- E10 (Intro to engineering) or other eng breadth course (see list)

Sophomore Year

- Math 53, 54 (Matrix Algebra, Differential Equations)
- Physics 7B (E&M)
- 2 Engineering breadth courses (see list)
- 2 - 3 Humanities/Social Studies
- High-level computer programming language (e.g., C, Java)

Questions?

- Be sure to download the specific degree requirements from the IEOR web site
- Students should meet with their advisor
- Feel free to contact me or come see me with any questions or concerns
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 - 4127 Etcheverry Hall, 642-7054, Ofc Hrs MWF 9-10 or by appt