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1.133 M.Eng. Concepts of Engineering Practice  
Fall 2007

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# Instructors

- Eric Adams
- Gayle Sherman (Administrative Assistant)

# Schedule and Room

- Monday and Wed; 8:45-9:45\*
- Wrap-up before Thanksgiving\*
- Friday seminars (w/lunch); 12-1

# Additional Matters-1/2

- Retreat follow-up
  - group and track email addresses to Aaron
  - first team assignment: group name
- Academic matters
  - registration problems
  - advising
  - classes

## Additional Matters-2/2

- Attendance
- Intramurals
  - MEng or share with other CEE (e.g., Parsons Lab)

# Workshops/Fieldtrips-1/2

- Introduction to AutoCAD
  - 7-9 pm Thursdays, Sept 13, 20, 27 & Oct 4
- Application of health risk assessment for management of contaminated sites
  - 9-12 am Friday Sept 28
- Introduction to GIS
  - 6-8 pm Tuesdays, Oct 2, 9, 16
  - Field trip Sat Oct 13

# Workshops/Fieldtrips-2/2

- MatLAB
  - Free from IST; also MIT computer stations, MEng computers, Introductory materials on course Web site
- Field trip to Cape Cod
  - Mass Military Reservation
  - USGS field station
  - Waquoit Bay National Estuary Research Reserve
  - Saturday Sept 22 (tentative)

# Syllabus/Themes-1/3

- What the profession does
  - Outside professionals (seminars)
  - Projects (more later)
- How the profession is run
  - Project level
    - getting work, responding to Requests For Proposals
    - project evaluation; management
    - conflict resolution: negotiation

# Themes-2/3

- Company level
  - profile of a company
  - Chase-an-engineer exercise
- Professional ethics
  - staff presentation, team exercises
- Personal professional skills
  - Written and oral communication
    - staff presentations
    - practice with critique
  - Self-advocacy, negotiation
    - staff presentations, workshops



# Themes-3/3

- Job searching
  - resume writing, interview workshop, networking, job fairs/campus interviews
- Professional Registration (more later)
- Team building/participation
  - group exercises
- Library skills

# Professional Registration-1/14

- Why?
  - Required to sign engineering drawings, do certain types of consulting, provide expert testimony
  - Helpful for promotion
  - Also for academics, though less so

# Professional Registration-2/14

- Procedures
  - Graduate from accredited undergrad program\*
  - Pass 8 hr FE exam
  - 4 years of increasingly responsible practice\*
    - grad school counts 1
  - Submit application
    - 6 letters of recommendation
    - Document experience (no more than 1 pound of paper)
  - Pass 8 hr PE exam

# Professional Registration-3/14

## FE (Fundamentals of Engineering)

### Exam Details

- Morning
  - 4 hour general exam
  - 120 multiple choice questions (1 point each)
- Afternoon
  - 4 hour exam in discipline (or general)
  - 60 multiple choice questions (2 points each)
- Closed book (reference materials supplied)
- Passing: Scaled score of 70%

# Professional Registration-4/14

## FE Exam (AM) Content (%); April 2006

• Chemistry	9	• Math	15
• Computers	7	• Mechanics	10
• Elect & Mag	9	• Prob/stat	7
• Engrg Econ	8	• Strength mat'ls	7
• Ethics	7	• Thermo	7
• Fluid Mech	7		
• Material Prop	7	• Total	100

[www.ncees.org/exams](http://www.ncees.org/exams)

# Professional Registration-5/14

## FE Exam (PM: Civil) Content (%); April 2006

• Surveying	11	• Struct Analysis	10
• Hydraul/Hydrol	12	• Struct Design	10
• Soil Mechanics	15	• Constr Mgmt	10
• Environ Engrg	12	• Materials	8
• Transportation	12		
		• Total	100

# Professional Registration-6/14

## FE Exam (PM: Environ) Content (%); April 2006

• Water Resources	25
• Water/WW Treatment	30
• Air Quality	15
• Solid/Hazardous Waste	15
• Environmental Science/Mgmt	15
• Total	100

# Professional Registration-7/14

## FE Pass Rates (%) April 2007 Discipline-specific

Examination Module	First Time Takers	Repeat Takers
Chemical	85	46
Civil	76	36
Electrical	69	19
Environmental	81	35
Industrial	61	26
Mechanical	80	33
General	77	29



# Professional Registration-8/14

## FE Pass Rates (%) April 2003 General exam

Undergraduate Major	First Time Takers	Repeat Takers
Chemical	82	29
Civil	71	26
Electrical	58	33
Environmental	83	33
Industrial	47	21
Mechanical	84	41
General	82	26

# Professional Registration-9/14

## PE Exam Details

- PE Civil
  - AM 40 multiple choice (breadth)
  - PM 40 multiple choice (depth; 1/5 disciplines)
- PE Structural I
  - 80 multiple choice questions (40 + 40)
- PE Structural II
  - 4 essay questions (pick 1/2 each session)
- PE Environmental
  - 100 multiple choice questions (50+50)
- Open Book

# Professional Registration-10/14

## PE Pass Rates (%) April 2007

Examination Module	First Time Takers	Repeat Takers
PE Architecture	66	26
PE Chemical	81	27
PE Civil	67	34
PE Elec & Comp	66	27
PE Environmental	73	35
PE Mechanical	64	30
PE Naval Arch	89	100
PE Structural I	51	37

# Professional Registration-11/14

## Comity (reciprocity) among states

- Applies in most states (including MA) but not all
- Some (including MA) require applicant to meet present-day requirements

# Professional Registration-12/14

## International students

- Applicants applying from non-ABET accredited UG engineering institutions must have their transcript approved.
  - Appraisal applications available through PCS, 150 Fourth Avenue North, POB 198689, Ste. 700, Nashville, TN 37219
  - See also <http://www.mass.gov/dpl/boards/en/misc/abetreq.htm>

# Professional Registration-13/14

## Continuing Professional Competency

- Required in some states (not MA)
- Measured by Professional Development Hours (PDHs)
  - Generally 15 PDHs required per year
- Typical awards
  - Continuing Education Unit (10)
  - Active participation in technical or professional society (2)
  - Published paper (10)

# Professional Registration-14/14

- FE Exam (Registration) Dates
  - Saturday, October 27, 2007 (Sept 1)
  - Saturday, April 12, 2008 (March 1)
- Registration Info: [www.pcshq.org](http://www.pcshq.org)
- More info:  
[www.state.ma.us/reg/boards/](http://www.state.ma.us/reg/boards/),  
[www.ncees.org/exams](http://www.ncees.org/exams),  
[www.mass.gov/dpl/boards/en/](http://www.mass.gov/dpl/boards/en/)

# Group Projects

- Conducted separately by track
  - Environmental
  - HPS
  - Geo might be separate or a blend with above



# Group Projects-Logistics

- Projects introduced/discussed 9/7, 9/14
- Projects selected by mid-September
- Draft proposals due early November\*
- Final proposals due early December
- Project work continues during January-term
- Final projects due late March/early April\*
- Individual theses usually culled from project
- Project web sites maintained throughout

# First Assignment

- Write your resume
  - See brochure from MIT Careers Office
- Due
  - draft by this Friday at noon (for peer review during Seminar 1)
  - on file by Sept 14 (we will review; later will go in CEED resume book)
  - updated as you go

# First Seminar

- Title: The MIT Career Services Office
- Speakers: D. Rosencrans
- Friday, Sept 7 at noon
- Bring:
  - 3 copies of resume
  - copy of a job description (from magazine, web, etc.) you would be interested in
- Volunteers needed
  - send resume and mock cover letter to Deborah Rosencrans at Careers office ASAP