Civil and Environmental Engineering at RPI
Size and Programs

- One of 207 CEE programs nationwide
- 17 faculty
  - 14 tenure-track, 3 research
- 6 staff
- 170 undergraduates
- 60 graduate students
- $2.5 M in research expenditures
- Two accredited undergraduate programs
  - Civil Engineering
  - Environmental Engineering
- Several graduate degrees
  - Civil Engineering
  - Environmental Engineering
  - Transportation Engineering
Faculty

- George List
  - Chair, network analysis, CITS director, ASCE Fellow

- Nicholas Clesceri
  - Environmental Program Director, ASCE Fellow, NSF program administrator, waste treatment

- Ricardo Dobry
  - Frequent keynote speaker, Geotechnical Centrifuge Center director, soil dynamics, earthquake engineering
Faculty

- Larry Feeser
  - CivE Coord. of UGrad Studies, ASCE Honorary Member, computer-aided design

- Jacob Fish
  - CivE Coord. of Grad Studies, Multiscale computational techniques, CAREER award, USACM Fellow, Journal Editor

- Dimitri Grivas
  - Sensing and imaging technology, infrastructure engineering
Faculty

- Chip Kilduff
  - Phisicochemical processes, BT initiatives, CAREER award, Kodak Junior Chair
- Simeon Komisar
  - Coord. EnvE Program, Darrin Teaching award recipient, water and wastewater treatment
- Russell Manson
  - Environmental, mathematical modeling of flow, river engineering and management
Faculty

- Marianne Nyman
  - Environmental, CAREER award, biodegradation, pollutant fate and transport
- Michael O’Rourke
  - Charles Martin Duke Award, buried lifeline protection, hazard mitigation
- Michael Symans
  - Structural vibration control, CAREER award, most recent addition
Faculty

- **Mourad Zeghal**
  - Computational geomechanics, system identification, CAREER award, seismic risk analysis

- **Thomas Zimmie**
  - Fishbach Travel Award recipient, ASCE Fellow, Geoenvironmental engineering
Additional Faculty

- **Joint Appointments**
  - George Dvorak (MANE)
  - Mark Shephard (MANE)
  - W. (Al) Wallace (DSES)

- **Research Faculty**
  - Tarek Abdoun
  - Korhan Adalier
  - Chris LaPlante
Accomplishments

- **Comprehensive in scope.**
  - Combined civil and environmental engineering.

- **Improved rankings**
  - Civil Engineering (USN&WR):
    - Graduate: from 35th to 20th in the past six years.
    - Undergrad: reached top 25 (top 10%) this year
  - Environmental Engineering (Gourman Reports)
    - Undergrad: #1 or #2 in last 3 years

- **Strategic faculty investments:**
  - Geotechnical (1)
  - Structural (1)
  - Environmental (3)
  - Four of these five have CAREER awards.
  - Transportation faculty search underway
Past Accomplishments - 2

- **Strategic research activities**:
  - SOE - Infrastructure research.
  - Within CEE:
    - IT and BT emphases
    - Earthquake engineering, computational mechanics, transportation/infrastructure, pollutant fate and transport

- **Maintain and enhance our research facilities**.
  - NSF/NEES: $2.5 M for the centrifuge facility (2000)
  - SOE: $150k for shaker table (2001)
  - Keck Water Quality Lab ($750 K)
  - NSF Major Research Instrumentation Lab for Particle and Colloid Analysis ($750 K)
Past Accomplishments - 3

- **Career-focused undergraduate program.**
  - Introduction to Civil and Environmental Engineering (freshmen)
  - Bedford Design Studio (part of MDL)
  - Capstone Design / Environmental Process Design (part of MDL)

- **Career-focused, hands-on undergraduate program.**
  - Admiral Lewis B. Combs Memorial Design Retreat
  - Sensors and Instrumentation course
  - Hands-on experiences
Mission and Vision

Our Mission: To educate civil and environmental engineering leaders of tomorrow for technology-based careers. To celebrate discovery, and the responsible application of technology, to create knowledge and global prosperity.

Our Vision: To be a top tier department of civil and environmental engineering with global reach and global impact – committed to technological excellence by integrating research and education, and in educating for career success.
Tenets

- Education is our core business (graduate & undergraduate).
- We create leaders, not followers.
  - Engineers on top, not on tap.
- IT tools and techniques are critical (modeling and simulation).
- Hands-on skills are important.
- Graded and non-graded experiences are part of the education process.
- Design, entrepreneurship, leadership, teamwork, and communication skills are critical.
- Teaching and research must be integrated.
- Partnerships are critical, locally and globally.
Overall Strategies and Actions

- Give environmental engineering a boost
- Improve the graduate program
  - More research expenditures and graduates
  - Unified MS, ME, and PhD programs
- Improve the undergraduate program
  - Larger class sizes, more selectivity
  - Greater breadth
  - Distinctive hands-on experiences
- Increase departmental resources
  - Boost the faculty size from 15 to 20-22
  - Hire 2-3 technicians
  - Increase our endowments (professors, students, labs, programs)
- Benchmark against peer institutions
Major New Initiatives - 1

- Engineering for Civilization
  - Dual major with STS
- Environmental Research Initiative
  - SoE, SoS, and H&SS
- Advanced Building Systems
  - SoE, SoA
- KLIU (Malaysia)
  - SoE, SoS, SoM
- CivE/EnvE joint research
- Hands On Experiences (UGrad)
Major New Initiatives - 2

- **IT:**
  - Sensors, instrumentation, wireless communications, remote control
  - Tele-operation, tele-observation
  - Subsurface imaging

- **BT**
  - Microbial systems engineering and biology
  - Strategic Technologies for Environmental Protection
  - Remediation of contaminated sediments
Supporting Hires – Next 5 Years

- Adds
  - Transportation engineering (1-2 Jr)
  - Environmental engineering (Sr, Jr)
  - Computational mechanics (2 Jr)
  - Geotechnical engineering (Jr)

- Result
  - Environmental: 6-7
  - Geotechnical: 4
  - Transportation / infrastructure: 3-4
  - Computational mechanics: 3
  - Structures: 3
Reflection: Rensselaer Plan Goals

1) Enhance our national leadership through innovative learning and teaching
2) Expand research activity in strategically significant areas
3) Increase the emphasis on entrepreneurship
4) Achieve true intellectual, geographic, gender and ethnic diversity in our students, faculty, and staff
5) Draw vitality from, and add vitality to the diverse communities with which the Institute interacts
6) Redesign and reinvigorate activities that enable the Institute’s activities
Innovative learning and teaching

- **Undergraduate**
  - More breadth within the civil curriculum
  - More collaboration with other campus entities (e.g., Arch, STS)
  - New hands-on experiences in the junior year
  - Greater use of software and laptops

- **Graduate**
  - Modeling and simulation
  - Tele-observation, tele-operation

- **Both**
  - New educational processes (e.g., teaching hospital-like experiences)
  - International experiences (e.g., Bedford Workshops)
  - International collaborations
**Expanded research activity**

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<th>School of Engineering Research Focal Areas</th>
<th>Departmental Focal Areas</th>
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<tr>
<td></td>
<td>Earthquake Engineering</td>
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<tr>
<td>Nanotechnology</td>
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<tr>
<td>Modeling, Simulation, and Design</td>
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<tr>
<td>Biological Engineering</td>
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<td>Electronics, Photonics, and MEMS</td>
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<td>Infrastructure Systems</td>
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<td>Interfacial Science and Engineering</td>
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Entrepreneurship

- Capstone Design, Environmental Process Design
- Bedford Workshop
- Admiral Combs Design Retreat
- Competitions (steel bridge, concrete canoe)
- Award programs
- Mentoring programs, seminars, and training workshops

NOF Inc.

“It’s not our fault you trust us.”
Diversity

- Increase diversity awareness among our faculty, staff, and students
- Strive to achieve 25% female and under-represented minority diversity among the departmental faculty members
- Recruit, support, and retain to graduation our female and underrepresented minority graduate students
- Retain our present female and underrepresented minority faculty
Communiversity

- Experiment with “teaching hospital” environments (e.g., with the City of Troy) so our students have engaging ways to learn about the practice of civil and environmental engineering
- Develop stronger, strategic partnerships with our stakeholders, locally and globally
- Create effective communication and marketing instruments
- Engage our alumni and friends through the department advisory committee, visiting committees, and other initiatives
Important dates

- Jan 2002: TRB Reception
- Apr 2002: Advisory Board Meeting
- May 2002: Bedford Workshop
- May 2002: Graduation
- Jul 2002: ABET Decisions
- Aug 2002: Adm. Combs Retreat
- Aug 2002: Next Fall semester