The Cooper Union
Nerken School of Engineering
Teresa A. Dahlberg, Dean

My Background

- B.S., M.S., Ph.D.: Electrical & Computer Engineering
- 10 yrs - IBM Corps, hardware/software developer
- 18 yrs - UNC Charlotte academic
- Associate Dean, College of Computing & Informatics
- Professor, Computer Science
- Founder & Director, Diversity in IT Institute
- Founder & Director, STARS Computing Corps, 501c3
- Teacher: Developing *T-shaped* professionals
- Researcher: wireless networking; broadening participation; STEM pipeline, over $20 million in grants
- National Science Foundation: CISE Advisory Committee, co-chair CISE Education Strategy Committee

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21st Century Engineers

- Rigorous analytical, theoretical, critical thinking skills
- Societal grand challenges
- Interdisciplinary
- Global context
- Leadership, soft skills
- Technologist, analyst, communicator
- Civic engagement
- STEM pipeline
- Agile focus

Nerken School students embody the 21st century engineer

Nerken School Aspirations

- Rankings – move from #7 to #1
- Rigorous curriculum – analytical, theoretical, critical thinking
- Interdisciplinary – E^4 & A+E+A+H
- Innovation atmosphere – creative, inventive, entrepreneurial
- Experiential learning – research, internships, international, service-learning, competitions
- Conservatory-style education – faculty/student collaboration, project-oriented curriculum, portfolios, leverage online
- NYC visibility – e.g., tech startup, wall street, healthcare, biomedical, sustainability, new trends in structural engineering, infrastructure development, computational science, data science, engineering for developing areas…
- NYC leader - STEM pipeline catalyst
- Pipeline to graduate and professional schools

Overarching Goal

*Preserve and enhance **academic excellence***

*while moving towards **financial sustainability***

Nerken School - Initiatives

1. Academic excellence

  - Articulate identity
  - Distinctive (co-)curricular themes - e.g., innovation, biomedical
  - Curricular structures to support experiential learning
  - Portfolios to showcase projects
  - Emphasize UG research, design, computation
  - Engineering education innovation - leaders
  - Streamline UG programs → augment with visible distinctions
  - Characterize current climate → how to preserve?
  - Strategic faculty hires

Visible Distinctions - Example

- Invisible (transcript)
  - B.E. EE
  - 150 credits
  - GPA=3.5

- Visible (transcript)
  - B.E. EE
  - minor in math
  - interdisciplinary graduate certificate – sustainability
  - Interdisciplinary graduate certificate – innovation
  - 150 credits
  - GPA=3.5

Visible Distinctions - Example

- Graduating Class statistics

  - 30% earned minors
  - 50% earned at least one graduate certificates; 20% earned more
  - 100% participated in experiential learning
    - 80%-internships; 50%-REU; 20%-study abroad; 90%-civic engagement; 70%-competitions
  - 20% have at least one pub; 5% have more
  - 60% filed provisional patent apps; 10% filed patents; 2% awarded
  - 20% awarded prestigious fellowships or awards
  - At least 50% of B.E. graduates have completed 10% of their coursework at the graduate level

Nerken School - Initiatives

2. Fee-based graduate programs
   - Masters (non-thesis), UG tracks, certificates, internships – NYC aligned
   - Masters (thesis), REU – feeder to grad and professional school
     - Support with TA and RA positions

3. Fee-based pre-college programs
   - E.g., 1-2 week experiences, Saturday experiences
   - Attract gifted high schoolers
   - Grants for underserved

   Align pre-college, UG, masters, placement

Nerken School - Initiatives

4. Student recruitment and retention

   - Outreach to increase yield
   - Visible programmatic distinctions
   - Increase freshman & transfer enrollment;
   - Expand summer session offerings (e.g., science and math)
   - Mentoring, student success

5. Communications and rankings

   - Messages, websites, newsletter, social media, videos
   - Market to peer institutions

Nerken School - Initiatives

6. Building community

   - Student engagement – campus, alumni, industry, NYC
   - Connect to professional development and advising

7. CV Starr Research Foundation

   - Research
   - Industry
   - Tech-transfer
   - Entrepreneurship

Nerken School - Initiatives

8. Faculty, staff, administrator development

   - Flexible faculty workload: Teaching, Research, Service/Leadership
   - RPT criteria based on objective measures; aligned with workload

   - Professional development
   - Formative evaluation
   - Feedback from stakeholders

Q&A

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