Status of the New ECE Building at the University of Illinois

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Acknowledgments

More than 20 faculty, staff, and student members of the ECE Department (and others) have been working for many years on needs, ideas, and plans for a potential new building.

We are grateful to James Lev and the University Architect Office, as well as to several Facilities and Services staff members who have been actively involved.
Professionals

- David King, Chairman of SmithGroup, lead architect

- SmithGroup has worked closely with the ECE department and campus architects.

- Engineering support by KJWW (Rock Island).

- Project managers:
  - Kirk Fernandes, Capital Development Board
  - Doug Wolters, F&S
Motivation

• The ECE Department is one of the nation’s largest.
  – About 100 faculty
  – Almost 600 graduate students
  – About 1700 undergraduates
  – More than 500 annual degrees

• Need a true *home* for community, student interaction, and the whole department
Motivation

• Now split among at least 6 buildings:
  – Everitt – main instructional lab and admin bldg
  – CSL – several research groups
  – MNTL – physical electronics research; clean space
  – Gas house – plasma, electronics, optics research
  – Beckman – imaging and bio-related research
  – MRL – some materials work
  – …
Laboratory Examples

- Undergraduate electronics laboratory
- Undergraduate freshman electrical and computer engineering laboratory
- Digital signal processing lab
- Digital projects lab
- Open projects lab
- Team projects lab
- Senior design lab
- Instructional cleanroom
- Many more
Opportunities

• Corporate sponsorship opportunities exist for instructional labs, classrooms, and a few other spaces.
Targets

• An “inside-out” plan for 230,000 gross ft² and 122,000 net assignable ft²

• $95 million total project budget with 50% state support

• Leverage proximity to Beckman, MNTL, CSL, while providing missing extra functions

• LEED Platinum certification; targeting the most energy-efficient engineering building in the world

• Showcase Illinois innovations
Test Bed

- The nation’s largest low-energy building test bed?
- Microgrid system to include solar PV and storage.
- More ambitious ideas under discussion.
Location

New ECE Building

Springfield Ave.

Everitt Lab
http://www.ece.illinois.edu/buildingcampaign/webcam.html
External Design

- Projected for *zero net energy* on an annual basis.
- At 230,000 gross square feet, the nation’s largest zero net energy building project.
Interior Sketches
Sample Lab Rendering
Zero Net Energy

• Emerging DoE building standards will push energy reduction by 2030.
• The combined building and parking structure achieve this unique objective.
• Extensive data monitoring – ultimately to the user level – for zero-net test bed.
Solar Array Plan
Building Envelope

- R-30 curtain rain wall system with terra cotta facing
- Passive solar elements to minimize heat load
- Design for natural light
Lighting

• 20-25% of energy in typical building
• New solid-state LED lighting
• New plasma lighting
• Highest energy-grade fluorescent lighting
• Daylight
• Higher efficiency multiplies benefits: less heat load.

www.philipslumileds.com
Heating, Ventilation, Air Conditioning (HVAC)

- Chilled beams – updated hot water heat/cool system
- Energy recovery wheels
- Heat recovery chillers
Solar Systems

- 300 kW system on the building roof
- 1000 kW or more on nearby north campus garage
- Integration with campus experimental microgrid.
Some Others – Planned or Likely

- Occupancy lighting sensors
- Premium efficiency electric motors
- EnergyStar appliances and equipment
- Plug-in vehicle ports in garage
- Massive sensor array
Long-Term Research

- Solar conversion and integration.
- Energy tracking and user control.
- Microgrids.
- Smart grid aspects.
- Low-energy buildings.
- Occupant behavior.