

Buildings and Energy: Design and Operation vs. sustainability



DR. PRABIR BAROOAH, ASSOCIATE PROFESSOR
MECHANICAL AND AEROSPACE ENGINEERING, UF.

DR. DUZGUN AGDAS, PE, ASSISTANT PROFESSOR
SCHOOL OF SUSTAINABLE INFRASTRUCTURE, UF (FORMERLY),
CIVIL ENGINEERING AND BUILT ENVIRONMENT SCHOOL, QUT (AUSTRALIA)

DR. RAVI SRINIVASAN, CEM, ASSISTANT PROFESSOR
SCHOOL OF CONSTRUCTION MANAGEMENT, UF

A graduate/undergraduate multidisciplinary course,
developed with financial support from FESC

Motivation



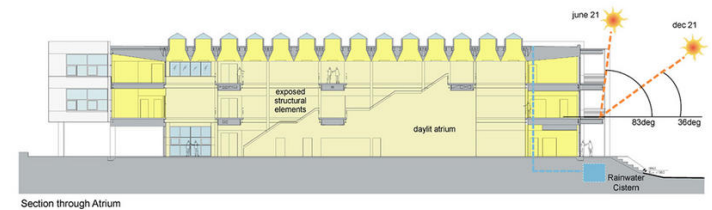
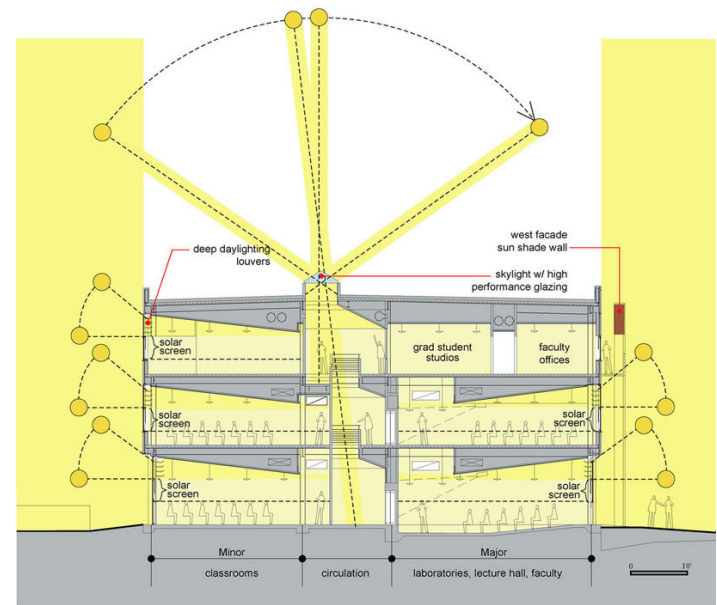
- ❖ The need to address the energy efficiency topic from all angles, i.e. design, construction, operation, which manifests itself in lack of energy efficiency of buildings
- ❖ Bridging the gap between different professions involved and create common knowledge base
- ❖ Create a learning environment to students working professionals for dissemination
- ❖ Create an opportunity for interdisciplinary research via knowledge cultivated through integration of input from parties involved
- ❖ Short term efforts are funded through FESC for a course development and delivery project

Course Goals



- ❖ Define the role of buildings in the energy sector
- ❖ Identify design and operational issues in achieving energy efficiency,
 - Better design doesn't always lead to better performance
 - Poor operation leads to energy wastage
 - Design for operation?
- ❖ Existing courses in the building sector: architecture, construction, energy analysis, HVAC design, etc., but lack integrated approach, and specific to Florida climate reduces the viability of these to masses.

- ❖ **Goal: Energy Engineering Course for Florida-Specific Buildings (3 cr)**



Section through Atrium

Rinker Hall, UF

Course Overview



- ❖ Target audience: both undergraduates and graduates in engineering, construction, and architecture.
- ❖ Project started in April 2014. Course development in progress. First offering planned for Fall 2014.
- ❖ To be offered through UF-EDGE (Electronic Delivery of Gator Engineering) for broader reach.



Rinker Hall, UF

Course Topics

- ❖ *Energy Codes, Standards & Protocols*
- ❖ *Ratings Systems*
- ❖ *Load Calculations & Equipment Sizing*
- ❖ *HVAC Operations*
- ❖ *High Performance Building Design*
- ❖ *Renewable Energy Systems & Low / Net Zero Energy Buildings*
- ❖ *Smart Buildings, Smart Grid*
- ❖ *Life Cycle Assessment*

