Objectives

- New approach to engineering education in a residential learning community
- Improve recruitment and retention in engineering undergraduates
- Interdisciplinary study of sustainability and design
- Integration of technology with social innovation
- Incorporate technical concepts and design practice in sustainability theme
- Expansion of residential-based education
Program

The Sustainable by Design Residential Academic Program (S-by-D RAP) creates a small college atmosphere within the confines of a large research university by combining living and learning environments. We provide curriculum in sustainability and design from interdisciplinary perspectives in small-sized classes to college freshmen through seniors, with strong links to graduate students who are involved in the program's teaching mission.

The unique curriculum of this program will engage students in projects that introduce qualitative and quantitative descriptions of the environment, written and graphical methods of communication, and multi-disciplinary approaches to address sustainability issues around the globe. The S-by-D RAP provides co-curricular activities, informal developmental advising, and career counseling for participating students. The primary goal of the S-by-D RAP is to provide students with an integrated learning experience that encompasses research, education, and service in an effort to fully engage them in their educational process.

Participants

- Capacity: 250 students (~150-200 freshmen, 50-100 sophomore-senior) in new LEED platinum dorm
- Opens Fall 2011 with 50 - 75 students
- Primarily recruiting from engineering, also environmental design, environmental studies students
- Coordination with sister RAP in social entrepreneurship for equitable development and sustainability (SEEDS) also with capacity up to 250 students (A&S and Business)
Affiliated Faculty

- JoAnn Silverstein, Director, S-by-D RAP, Professor Civil, Environmental, and Architectural Engineering (CEAE)
- Susan Clarke, Director SEEDS RAP, Professor Political Science, Director, Center to Advance Research and Training in the Social Sciences (CARTSS)
- Matt Jelacic, Faculty in Residence, Assistant Professor Architecture and Planning
- Robyn Sandekian, Associate Director, S-by-D RAP, CEAE and Mortenson Center in Engineering for Developing Communities (MCEDC)
- Cathy Comstock, Associate Director, SEEDES RAP, Comparative Literature and Humanities.
- Bernard Amadei, Professor, Mortenson Chair, CEAE, MCEDC
- John Zhai, Associate Professor, CEAE Building Systems Program
- John Barbour, Instructor, Architecture & Planning, Environmental Design

Building Features

- Energy efficient – LEED platinum points reached in design and construction
  - Corridor-level electricity monitoring
  - Accessible elements of heating/cooling system
  - Shower/sink gray water treatment and reuse in toilets
  - Daylighting
  - Energy saving materials
  - Stormwater control and water-saving landscaping
- 6 new classrooms, including 30-machine academic computing lab
- 11 offices for faculty and staff
- Group study and meeting rooms on all corridors
- Great room, community kitchen
S-by-D Curriculum 2011-2012

- Freshman courses
  - AREN 1037 Building Information Modeling (REVIT) (CEAE)
  - GEEN 1410 Sustainable Design Projects (required) (CEAE, ENVD)
  - PSCI 2028: Social Entrepreneurship and Sustainability (required) (A&S)
  - ANTH 1135: Contemporary Tanzania – Conservation, Development, Social Entrepreneurship (A&S)
  - HIST 1020: Western Civilization (A&S)
  - WRTG 1150 Technical writing with sustainability focus (A&S)
- Technical electives using WV 40 North LEED features
  - CVEN 4833/5833 Residential water reuse: water conservation impacts, design, operation, regulation, utility impacts (CEAE)
  - CVEN 4830/5830 Sustainability in the Built and Natural Environments (CEAE)

Other program elements

- Building-centered research opportunities
  - Archived BIM and supporting documentation on design and construction of building, cost of LEED criteria
  - Monitoring energy and gray water recycling
- Outreach learning projects, in coordination with MCEDC
- Faculty in Residence and visiting scholars
- Participating graduate students as teaching resident assistants
- Upperclass and graduate students as resident learning assistants
- Certificate in sustainability being planned.
Financing

- Student program fees - $850/year
- Support from Provost, including new faculty line in CEAE
- In-kind commitment for teaching from CEAE and College: four courses/year
- Grants
  - $63,000 Engineering Excellence Fund for computer lab
  - $10,000 Gamm Family for GEEN 1410

Benefits to CEAE

- Recruiting more CE and AE student majors
- Unique small class teaching setting for faculty
- Resources to bring sustainability concepts into engineering and social science courses
- Williams Village North is field lab for CEAE students interested in projects
  - So far: 1 MS thesis project, 1 MS report, two undergraduate research projects on building energy conservation and water reuse features.
  - Proposal submitted for MCEDC field lab
  - Support for CEAE students as Ras and TRAs