



Physics Department Summer Half Block

June 2nd 2021

Intro to Architectural Engineering: *Designing for a Modern Grid, Energy Efficiency, Sustainability, and Resiliency*

Residential and commercial buildings consume 40% of our nation's energy. With a growing population, increasing environmental concerns, and rising energy costs, the integration of energy efficiency, renewable energy sources, and strategies to increase resilience is essential to today's building design and renovation projects. Explore the field of architectural engineering through this fun, project-based course focused on optimizing building energy systems for occupant comfort, energy, grid-connection, and the environment.

In this course, students will design a fictitious, net-zero energy environmental education center for a local city open-space nature preserve. Students will:

- Develop design goals and determine energy targets
- Conduct a site analysis
- Work on basic building design and architectural programming
- Determine design strategies that are regional, passive, active, resilient, and include materials with low environmental impact
- Determine renewable energy sources to meet net-zero energy goals

Education and Training

M.S., Civil Engineering, *University of Colorado at Boulder: Building Systems Program, 2010*
B.A., Physics, *Colorado College, 2003*

Biography

Rois Langner is a Senior Engineer in the Commercial Buildings Research Group at NREL. Her work at NREL, starting in 2010, has focused on methods to achieve ultra-high efficiency targets, cost-effectively in commercial buildings for zero energy performance, whole building integration, and optimized building design and operation for load flexibility and grid coordination. Rois currently oversees the Commercial Buildings Research Group's initiatives on zero energy and leads the U.S. Department of Energy's Better Buildings Alliance Renewables Integration Technical Research Team, which works closely with building owners and managers, and industry partners to understand and support new technological advances in strategic integration of renewables, energy storage, building load flexibility, and grid coordination.