

## CIV 394 – Sustainability of Building and Infrastructure Systems

**Current Catalog Description:** This course introduces the different challenges associated with making building and infrastructure systems sustainable. This course will teach the students tools to evaluate economic, environmental, and social aspects of building sustainability.

**Prerequisite:** AMS 361 or MAT 303 or MAT 305; PHY 132, PHY 134

**Corequisite:** None

**Textbooks and/or** No required textbook

**Other Required** Recommended textbooks:

**Material:** Sustainable Construction: Green Building Design and Delivery, 5th Edition by Charles J. Kilbert, 2022, John Wiley & Sons, Inc.

**This course is:** Not Required

- Topics Covered:**
1. Sustainability and buildings
  2. Building life cycle analysis (LCA) and lift cycle cost analysis (LCCA)
  3. Building energy modeling and simulation
  4. Building energy management
  5. Impact of building occupants and behavior challenges
  6. Renewable energy and efficiency
  7. Existing buildings retrofits and challenges
  8. Building certifications
  9. Circular economy in buildings
  10. Emerging technologies for building sustainability

**Course Learning Objectives and Student Outcomes:**

Course Learning Objectives	ABET Student Outcomes
Understand the role of built environment in reducing energy consumption and greenhouse gas emissions.	1, 7
Understand the challenges associated with making new and existing buildings sustainable.	1, 7
Explore the economic, environmental, and social benefits of sustainable built environment operations.	2, 4
Learn to use tools and techniques to evaluate the sustainability performance of built environment from economic, environmental, and social perspectives.	2, 4, 6
Identify opportunities to apply the tools and techniques learned in the course to achieve sustainable buildings and infrastructure systems.	2, 6, 7
Develop team presentation and report writing skills.	3, 5

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