**EMCH 529 - Sustainable Design and Development**

**Credit hours** – 3  **Contact hours** – 50 minutes MWF or 75 minutes TTh

**Instructor** – Wally Peters

   a. The students will be required to read Archival Journal Papers and two books (one is from a reading list and one is *Are Your Lights On?*, by Gause and Weinburg, 1990, Dorset House

**Specific Course information:**
   a. **EMCH 529 - Sustainable Design and Development.** (3) System design and development accomplished with consideration of environmental/ecological, economic and social constraints. Introduction to sustainable design including a design project.
   b. **Prerequisites:** Consent of instructor
   c. **Mechanical Engineering Elective**

**Course Goals:**
   a. **Outcomes**
      1. The students should be able to give an acceptable definition of sustainable design and development.
      2. The students should be familiar with the social, economic and environmental constraints for sustainable design and development.
      3. The students should be able to analyze systems, i.e. they should be able to identify inputs, outputs and system laws and constraints.
      4. The students should show the ability to read and comprehend concepts from other disciplines. This objective includes a demonstration of the ability to write and speak in a critical fashion.
      5. The students should be able to accomplish a sustainable design for a “customer.” This design experience involves working on multidisciplinary problem as a member of a multidisciplinary team.
      6. The students should be able to report their design in written and oral form.

   b. **Relationship of Course to Program Objectives:** The importance of each course objective to meeting the program outcomes is indicated with the following scale: 3 = major importance; 2 = moderate importance; 1 = minimal importance. Blank if not related.

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<tr>
<th>Program Outcomes (see list for complete description)</th>
<th>CO 1</th>
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<tbody>
<tr>
<td>1.1. analyze, design and realize</td>
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<td>3</td>
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<td>1.2. computation techniques</td>
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<td>1.3. design and interpret experiments</td>
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<td>1.4. apply linear algebra, calculus</td>
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<td>1.5. apply statistical methods</td>
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<td>1.6. understand chemistry and physics</td>
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<td>2.1. engineering economic analyses</td>
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2.2. plan and execute projects |  |  | 3 | 2
2.3. oral and written communications | 2 | 3 | 3 | 3
2.4. professional responsibility | 3 | 2 | 3 | 3
2.5. multi-disciplinary teams | 2 | 2 | 3 | 3
2.6. life-long learning | 2 | 2 | 3 | 3
3.1. engineering in modern society | 2 | 2 | 3 | 2
3.2. literature, arts, humanities. | 1 | 2 | 3 | 2
3.3. foreign language

**Topics Covered:**

1. Introduction to sustainable design and development.
2. Teaming, team formation and team communication.
3. Introduction to industrial ecology.
5. Eco-accounting and economic aspects of sustainable design.
6. Industrial products and processes—environmental considerations.
7. Social aspects of sustainable design.
8. Design methodologies.

**Person Who Prepared This Description and Date of Preparation:**
Walter H. Peters, 02/10/2005
Approved by Walter H Peters 3/16/11