EE-4900
Design Fundamentals

Curricular Designation:  CpE: required EE: required

Catalog Description:
The design process. Includes team design activities and studies project management. Credits: 1.0 Lec-Rec-Lab: (1-0-0) Semesters Offered: Fall Pre-requisites: EE 4901(C)

Textbooks and/or Other Required Materials:
None – class notes provided as needed.

Prerequisites by Topic:
1. Completion of core EE or CpE courses for departmental majors, consistent with senior standing. Engineering majors from other departments may enroll on a multidisciplinary project and must similarly have senior standing.
2. Ability to model engineering problems and conduct experiments in the laboratory, at the level appropriate to the engineering core curriculum.

Course Objectives:
1. Apply the engineering design process and the scientific method to a large-scale project that has a modest risk.
2. Develop familiarity with documentation and written and oral communications relevant to a professional engineering career.
3. Familiarity with fundamentals of project management including planning, scheduling, and budgeting.
4. Familiarity and practice of teamwork skills, human factors in project management, and leadership on an engineering team.
Topics Covered:

1. The engineering process and the scientific method applied to formulating and weighing alternative solutions to a real-world problem.

2. Documentation and communications, including preparation of poster and oral presentations, a comprehensive final report, and an engineering notebook.

3. Practical electronic system design, fabrication, and testing.

4. Project planning, scheduling, budgeting.

5. Human factors and leadership.

6. Meeting and time management.

7. Engineering specifications, design constraints, and standards.

8. Intellectual property and patents.

9. Statistical analysis: data analysis and quantitative decision making.

10. Ethics and the professional engineering culture.

11. System failures and hazards.

Relationship of Course to Program Objectives (See UPAC SOP, Tables 1 and 2):

- **EE:**
  - Outcome: d via topics: 2, 4, 5, 6, 7, 9
  - Outcome: f via topics: 5, 8, 10, 11

- **CpE:**
  - Outcome: d via topics: 2, 4, 5, 6, 7, 9
  - Outcome: f via topics: 5, 8, 10, 11

Contribution of Course to Meeting the Professional Component

- **EE:** Engineering Topics
- **CpE:** Engineering Topics

Class/Laboratory Schedule (note: 1 hour = 50 minutes):

Lecture: 15 hours = 1 hours/week for 15 weeks

Prepared by: Dr. David H. Stone, Associate Professor, February 9, 2004