EE-3970
Computer Engineering Professional Development

Curricular Designation:  CpE: required, EE: elective

Catalog Description:  Introduces professional topics such as team organization, plagiarism, ethics, IEEE writing, speaking and citation styles, experimental design, data gathering and analysis, software instrumentation, benchmarking, and industry standards. Individual and team projects require integration of knowledge across prerequisite course boundaries. Credits: 2.0  Lec-Rec-Lab: (2-0-0) Semesters Offered: Fall Spring. Pre-requisites: (CS 2911 or CS 3911) and CS 2141 and MA 3710.

Textbooks(s) and/or Other Required Materials:

Prerequisites by Topic:
1.  Introduction to elementary probability and statistics, including: familiarity with random variables, expected (mean) values, correlation, mean squares curve fitting, and the central limit theorem.
2.  Familiarity with high-level-language computer programming, including C/C++
3.  Introductory numerical methods, including numerical stability.

Course Objectives:
1.  Familiarity with professional ethics issues, including IEEE and NSPE codes of ethics, intellectual property issues, and human subjects.
2.  Introduction to topics in teamwork, project management, and group-based problem solving methods.
4.  Familiarity and practice with statistically valid experimental design, including instrumenting source code, linear regression and curve fitting, parameter estimation, confidence intervals, and hypothesis testing.
5.  Practice integrating and applying knowledge acquired from different disciplines, including statistical analysis, computer programming, teamwork, and technical writing.
Topics Covered:

1. **Professional Ethics**: avoiding plagiarism, intellectual property, patents, professional practices & standards (incl IEEE & NSPE codes), ethical use of human subjects.


3. **Effective Teamwork Methods**: initial team formation & organization, project management tools, group-based problem solving methods.

4. **Statistically Valid Experimental Design**: writing and evaluating surveys, instrumenting program source code & gathering performance statistics, application of linear regression & correlation, parameter estimation & confidence intervals, hypothesis testing.

5. **Tools and Techniques**: using a spreadsheet for routine statistical analysis, using a project planning software package, & instrumenting source code.

6. **Continuing Education & Graduate School**: options, opportunities, & procedures.

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

- **EE**: Outcome: b via topic(s): 4
  Outcome: d via topic(s): 3
  Outcome: f via topic(s): 1
  Outcome: g via topic(s): 2
  Outcome: i via topic(s): 6
  Outcome: k via topic(s): 5

- **CpE**: Outcome: b via topic(s): 4
  Outcome: d via topic(s): 3
  Outcome: f via topic(s): 1
  Outcome: g via topic(s): 2
  Outcome: i via topic(s): 6
  Outcome: k via topic(s): 5
  Outcome: n, r via topic(s): (all)

**Contribution of Course to Meeting the Professional Component:**

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

**Class/Laboratory Schedule** (note: 1 hour = 50 minutes):
Lecture: 30 hours = 2 hours/week for 15 weeks

**Prepared by:**
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