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CEG 498: Design Experience

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CEG 498 - Design Experience : Syllabus
Department of Computer Science and Engineering
Wright State University
Fall 2007 - Winter 2008

Brief Description

CEG 498 (Design Experience) is a summative computer engineering design project course that builds upon previous engineering, science, mathematics and communications course work. CEG 498 projects are a minimum of two quarters in length and must be completed in groups of at least three students. Projects are selected under the guidance of the course instructor and are tailored to both student interest and formal classroom preparation. Students are evaluated both on their individual contributions as recorded in a graded engineering journal and on the quality of their collective efforts as reflected in group generated products.

Student groups meet with the course instructor at least once per week for evaluation and guided discussion. CEG 498 also contains a formal seminar series covering a number of areas of engineering practice. The formal seminar series is meant to augment the weekly guided discussions. Active participation will be required.

Instructor

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Textbook

There is no required textbook.

Detailed Course Description

CEG 498 is project-based course. Students will work in groups to complete some significant engineering project of their choosing. In addition, students will be required to actively participate in a seminar series on professional engineering practice. Topics will include, but not be limited to, discussions of engineering ethics, engineering economics, and intellectual property rights.

Each project group will be required to manage its own efforts to complete its project in a timely manner. Group members will be required to keep individual journals recording both their efforts as well as their personal impressions of the project. Students will be graded based on both the quality of the group-produced products and the quality of their individual efforts as reflected in their design journals.

There will be an initial meeting scheduled early in the quarter where we will discuss potential projects and determine how the class will be divided into groups. Students are encouraged to bring their own project ideas, but several will be provided for those requiring assistance in project selection. During that initial meeting we will also discuss, in detail, what is expected of you as an individual and what is expected of your group.

Additional meetings of the class will be by appointment by project group. Every project group will be required to schedule a weekly meeting. These meetings must be attended by every group member as well as the course instructor. Since the projects will be student managed, the exact nature and style of these meetings is at the group's discretion. However, every member of the group is expected to participate.

During final exams, each group will make a public presentation describing and demonstrating their work. These presentations will be open to the university community and will be graded. Specific details on the nature of those presentations will be provided as we approach the end of the quarter.

Attendance Policy

Not attending weekly meetings harms the other members of your group and makes it much more difficult for the instructor to assess your contributions to the group effort. Therefore, attendance and active participation in the weekly meetings is required. Failure to attend a meeting or gross lateness of arrival (more than 15 minutes late) will result in point deductions and will negatively affect your final grade. Since groups will be given wide latitude in scheduling meeting times (evenings, weekends, etc.), it should be possible to schedule around individual member's commitments. Emergencies, however, do happen. Lateness or absence can be excused if there is a valid reason. Illness, job interviews out of town, death in the family, inclement weather or accidents for commuters, etc., are valid reasons. Oversleeping, a term paper due, an exam to cram for, etc., are not valid reasons. If you know you're going to be late or miss a class, please let the instructor know (E-mail, phone call, a message brought by a fellow student). Also, let your groupmates know, so that they may plan for your absence and make the best use of their time. The instructor reserves the right to determine what constitutes a "valid reason" on a case by case basis.

Students are required to participate in a minimum of two engineering practice seminars per quarter. Some of these will be required attendance for the whole class (and will be scheduled during the regular class scheduled time), and some will be optional opportunities to meet this requirement. Failure to actively participate in the minimum two seminars per quarter will result in failure of the course.

Grades

You will have an opportunity to earn up to 100 points for various activities relating to your project. Letter grades will be assigned based on the following scale:

| | |
|----------|---------------------|
| <i>A</i> | 90 points and up |
| <i>B</i> | 89 - 80 points |
| <i>C</i> | 79 - 70 points |
| <i>D</i> | 69 - 60 points |
| <i>F</i> | 59 points and below |

Note that failure to participate in the minimum two (2) engineering practice seminars in any one quarter will result in a failing grade for that quarter.

Points are earned in three categories. Those categories, and the maximum number of points earnable in each, are:

| | |
|-------------------------------|-----------|
| <i>Individual Performance</i> | 50 points |
| <i>Group Documents</i> | 40 points |
| <i>Group Presentation</i> | 10 points |

Individual Performance

Points in this category are awarded based on assessments of your personal contributions to the group effort. The instructor will make these assessments based on observations of your participation in group meetings and by examining your personal design journal.

The purpose of the journal is to be an archival record of your personal progress, contributions, and impressions. What you should be shooting for is a document that both you and the instructor can use to determine "what you were doing and thinking" at particular points in the project. In the "real world" such journals are often the basis for patent claims and defenses, and thus may become a legal document. Since the journal is largely a personal document, its format and specific content are up to you. All journals, however, must meet the following minimal standards:

1. Journals must be neat. Handwriting and sketches do not have to be publication quality, but they must be legible.
2. One substantive, dated entry must be made per week. Additional entries are encouraged. No detail is too small.
3. Design ideas should be recorded as they occur to you. Attaching code listings and screen dumps relating to the design idea is encouraged.
4. Results of testing and subsequent revisions of ideas should be recorded.
5. Did you get ideas, code, or techniques from some other person either inside or outside of the group? Record it. Ethics demands you properly attribute intellectual property to its creator.
6. Do you detect problems in your own work habits or in the dynamics of your group? Record them with constructive comments on how to fix them. Have you detected habits in other members of your group that seem to contribute to the common good? Record your observations and attempt to emulate those behaviors if you can.

Sketchy, infrequently utilized, sloppy, poorly written journals will have an adverse effect upon your final grade. Journals are subject to informal spot-inspection at any time by the instructor to insure that they are being kept regularly and with appropriate format and content. The instructor will collect the journals twice during the quarter for detailed examination and evaluation.

Points in the "Individual Performance" Category will be awarded as follows:

| | |
|---|---|
| <i>Regularity</i> (5 points) | The fraction of weeks in the quarter for which there is a substantive journal entry times 5. |
| <i>Neatness</i> (5 points) | The instructor's subjective evaluation of the journal's clarity, legibility, and organization |
| <i>Design Ideas</i> (10 points) | The instructor's evaluation of the quality of code, algorithm descriptions, and any other figures relating to design ideas as reflected in your journal. |
| <i>Design Testing and Critical Review</i> (10 points) | The instructor's evaluation of how well you ensured the merit of your ideas. Did you test? How? Why should anyone believe your ideas are workable? Are your ideas safe? You are ethically responsible to protect the users of your product from harm. Have you? Although most actual testing will occur in the second quarter, this includes consideration of testing and test issues during the first quarter. |
| <i>Group Observations</i> (5 points) | The instructor's evaluation of your observations of group dynamics. See point 6 in the standards for the design journal. |
| <i>Contribution and Progress</i> (10 points, 1 point per week) | Instructor's subjective evaluation of whether you make adequate progress each week. Assessed based on your report at group meetings. |
| <i>Attendance</i> (5 points) | The fraction of total group meetings attended times five |

Group Documents

Points in this category are awarded based on assessments of documents your group collectively authors. Specific deliverable documents will be negotiated with each individual team, but **typically**, each group will be required to produce the following collective documents. Note that once a schedule has been defined in the *Proposal*, points will be deducted for lateness of these documents unless specifically excused.

Proposal / Requirements
(20 points, first quarter only)

This document should explain specifically what you intend to do for your project and which team members will be responsible for what aspects of it. One approved, this document will serve as a "contract" between the instructor and the group. The group's final products will be evaluated against the expectations spelled out in the proposal. The proposal should include a milestone chart covering both quarters, broken down by each individual student. This should include the deliverable dates for the remaining documents. Economic, safety, and ethical issues should also be addressed.

Specification/ Design
(20 points, first quarter only)

This document should give a specification for the product(s) your group will deliver as well as a high level discussion of the methods and techniques that will be employed. Pay particular attention to describing how your specification fulfills your requirements and how your design satisfies your specification.

Implementation Notes
(20 points, second quarter only)

This document should contain "engineer's notes" that would allow a reasonably skilled engineer to understand, maintain, and modify your group's products. The discussion should be focused and practical.

Users' Manual
(10 points, second quarter only)

This document should contain installation and operation instructions for the users of your product(s). It should be aimed at the "average user" and should not require that the reader be an engineering professional.

Course Debriefing
(10 points, second quarter only)

This document should contain the group's collective answers to the following questions:

1. Did your group management style work? If so, why? If not, why? If you were to do the project again, what would you do the same, what would you do different?
2. Are there any particular safety and/or ethical concerns one could reasonably have concerning the use of the product(s) your group produced? If so, what are they? What steps did your group take to ensure these concerns were addressed. Are there any additional steps you would have taken if you had more time or if you were to do the project again?
3. Did you test your product(s). Are you sure they work as advertised? Why or why not. Can you think of any situations in which you haven't tested your product(s)? Are these situations significant?

Note, candor is the most valued feature of course debriefing document. There's no need to cook your responses in an attempt to match what you think the instructor wants to hear. Honesty is easy -- or it should be. Further guidance for this document will be made available at the appropriate time.

Group Presentation

Each quarter your group will give a formal, public presentation of its products to the university community. Advertising as well as scheduling a room should be coordinated in a timely manner through the department office. The specific nature of these presentations will be discussed with each group individually as we approach the end of each quarter.