**Texas A&M University**
**Department of Computer Science**
**Spring 2004**

# CPSC 483: Computer System Design

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|---|---|---|---|
| **Section 501**: | MW | 4:10-5:00PM | HRBB 104 (Lecture) |
| | TR | 3:20-5:30PM | HRBB 218 (Lab) |
| **Section 502**: | MW | 4:10-5:00PM | HRBB 104 (Lecture) |
| | MW | 5:10-7:00PM | HRBB 218 (Lab) |

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**TAs**: Steve Ortiz, steve-ortiz@tamu.edu, 520 HRBB, 845-0531
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**URL:** http://courses.cs.tamu.edu/rgutier/cpsc483_s04/

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## Catalog Description

Engineering design; working as a design-team member, conceptual design methodology, design evaluations, total project planning and management techniques, design optimization, systems manufacturing costs considerations; emphasis placed upon student's activities as design professionals. Prerequisites: CPSC 431 and 462 and senior classification.

## Textbook and references

No official textbook is required. Material will be drawn from the literature, manufacturer's datasheets and user manuals. A highly recommended introduction to the engineering design process is the textbook by Barry Hyman entitled *Fundamentals of Engineering Design*, 2nd Ed., (Prentice Hall, 2003).

## Detailed Course Description

CPSC 483 is a project-oriented course aimed at developing system integration skills. Students work in groups of 3-4 people to complete a significant engineering design project. Every project requires complete implementation, documentation and demonstration of a computing system design with both hardware and software components. The focus is not only on the final product but also on design methodology, management process and teamwork.

Each team 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 product and their individual contributions.

Every team will be required to schedule a weekly meeting with the course instructor and the TAs, preferably during the official lab hours. These meetings must be attended by every group member. 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 week, 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 these presentations will be provided as we approach the end of the semester.

**Course objectives**

To prepare students for engineering practice with a major design experience based on the knowledge and skills acquired in earlier course work and incorporating engineering standards and realistic constraints that include most of the following considerations: economic; environmental; sustainability; manufacturability; ethical; health and safety; social; and political.

**Expected outcomes**

It is expected that successful participation in the course will allow the student to demonstrate:

- an ability to apply knowledge of mathematics, science, and engineering (3.a)
- an ability to design and conduct experiments, as well as to analyze and interpret data (3.b)
- an ability to design a system, component, or process to meet desired needs (3.c)
- an ability to function on multi-disciplinary teams (3.d)
- an ability to identify, formulate, and solve engineering problems (3.e)
- an understanding of professional and ethical responsibility (3.f)
- an ability to communicate effectively (3.g)
- the broad education necessary to understand the impact of engineering solutions in a global and societal context (3.h)
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (3.k)

**Grading Policy**

The final grade you will receive in the class will be based on points accumulated during the semester. Thus, both continued progress (the process) and the quality of your product (and other deliverables) will determine your grade. Although the bulk of your grade is based on the performance of your team, individual performance will also be gauged.

- **Project Proposal (10%):** These points will be based on the originality, creativity and feasibility of the proposed work, the analysis of alternative solutions, the consideration of economic and societal aspects, the project management approach, and the quality of the oral presentation and accompanying written proposal.
- **Bi-weekly Reports (10%):** This grade will be based on your team's ability to maintain the project on schedule, as well as on the quality of the bi-weekly written reports.
- **Critical Design Review (10%)**: The CDR is a mid-semester evaluation of your project. The grade will be based on your progress to date, and the quality of the oral presentation and accompanying written report.
- **Final Communication (20%):** This grade will be based on the quality of the final presentation, and the final documentation, which should include the following items:
    - Project Proposal: A copy of the original Project Proposal.
    - Implementation Notes: This document should contain "engineer's notes" that would allow a reasonably skilled engineer to understand, reproduce and modify your group's products. The discussion should be focused and practical.

- User's Manuals: 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: This document should contain the group's collective answers to the following questions:
  - Did your *group management* style work? If you were to do the project again, what would you do the same, what would you do differently?
  - Are there any particular *safety* and/or *ethical* concerns with your product(s)? What steps did your group take to ensure these concerns were addressed? Are there any additional steps you would have taken if you were to do the project again?
  - Did you test your product(s)? Do they work as advertised? Can you think of any relevant situations in which you haven't tested your product(s)? If you were to do this project again, what additional *verification* and *testing* procedures might you add?

- **Project Grade (30%):** A final grade will be assigned to your project based on the completion of all the objectives stated in the proposal, as well as on a live demonstration in front of the class.
- **Individual Performance (20%):** Points in this category are awarded based on assessments of your personal contribution to the team efforts:
  - Notebook (10%): A grade will be assigned to your personal design notebook based on the regularity, clarity, legibility and organization of your annotations.
  - Participation (5%): The instructor and TAs will evaluate your attendance to meetings, and participation in the discussions.
  - Peer Review (5%): You will be asked to evaluate and comment on the performance of each of your team members.

**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, punctuality and active participation in the weekly meetings are required. Failure to attend a meeting or late arrivals (more than 15 minutes late) will reflect in your individual grade. 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. Ultimately, the instructor reserves the right to determine what constitutes a "valid reason" on a case by case basis. If you know you're going to be late or miss a class, please let the instructor know (e-mail, phone call). Also let your teammates know, so that they may plan for your absence and make the best use of their time.

**Scholastic Dishonesty**

Please review Section 20 of the TAMU Student Rules (http://student-rules.tamu.edu/) for a list of examples of scholastic dishonesty. In particular, be aware of the issues of *plagiarism* and *fabrication of information*. The use of existing software implementations or hardware designs should be discussed with the instructor prior to being incorporated into the project. Proper credit

must be given to the original source of concepts, designs, software, technical documents, scientific literature, etc.

**Course Schedule and Milestones**

| Week | Date | Classroom meeting | Material due dates |
|---|---|---|---|
| 1 | 01/19 | Martin Luther King day | |
| | 01/21 | Course introduction | Resumes |
| 2 | 01/26 | Teams are formed | |
| | 01/28 | | |
| 3 | 02/02 | | |
| | 02/04 | | |
| 4 | 02/09 | Proposal presentations | Project proposals |
| | 02/11 | Proposal presentations | |
| 5 | 02/16 | | |
| | 02/18 | | |
| 6 | 02/23 | | Biweekly report |
| | 02/25 | | |
| 7 | 03/01 | | |
| | 03/03 | | |
| 8 | 03/08 | CDR presentation | Critical Design Review |
| | 03/10 | CDR presentation | |
| 9 | 03/15 | Spring Break | |
| | 03/17 | Spring Break | |
| 10 | 03/22 | | |
| | 03/24 | | |
| 11 | 03/29 | | Biweekly report |
| | 03/31 | | |
| 12 | 04/05 | | |
| | 04/07 | | |
| 13 | 04/12 | | Biweekly report |
| | 04/14 | | |
| 14 | 04/19 | | |
| | 04/21 | | |
| 15 | 04/26 | | Biweekly report |
| | 04/28 | | |
| 16 | 05/03 | | |
| | 05/05 | | |
| 17 | 05/10 | Final presentations/demos | Final report |
| | 05/12 | Final presentations/demos | Final report |