Department of Computer Science
College of Engineering,
University of Nevada, Reno

Syllabus

CPE 426 Senior Projects in Computer Engineering – 2008

Lectures: TR, 4:00 – 5:15 pm, FH-129

Instructor:
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Office hours: R 3:00 – 4:00 pm or by appointment or chance

Course outline: This capstone course emphasizes team collaboration and application of modern engineering approaches to building computer-based systems that include a significant hardware component. The development by each team of an original, industry-strength project (software + hardware system) is the main objective of the course. Projects must be designed and implemented in the context of realistic engineering constraints and must follow effective engineering standards and practices. The instructor will present lectures on the Unified Modeling Language (UML) and its application to system analysis and design and the teams will report on their project's progress by giving presentations and submitting deliverables related to the project. The teams will deliver and present project parts at the following stages: topic proposal (*concept*), system specification (*requirements*), system design (*model*), and implemented system (*in-progress* & *final product*). At the beginning of the semester the teams will set up web sites for their projects, web sites that will be then updated regularly to reflect the projects' progress. At the end of the semester there will be a public Senior Projects Workshop with project presentations, video clips, demos & posters.

Prerequisite: CS425 Software Engineering

Texts:

- The *required textbook* for CS426 is Jim Arlow's and Ila Neustadt's "UML and the Unified Process: Practical Object-Oriented Analysis and Design," second edition, Addison Wesley, 2005.
- A *recommended book* for deciding on various human-computer interface aspects of the projects (but not required for the test) is Donald Norman's "The Design of Everyday Things," Basic Books, 2002, ISBN: 0465067107.
- For each individual project *an additional book* ("*project domain book*") will be consulted, together with *at least four reference articles* (journal papers, conference papers, or scientific web publications). This extra reading will be assigned shortly after the project topics will be defined by the teams. The project domain book and the articles will provide support for broadly focused, multi-disciplinary and cross-cultural projects and will be used as references in presentations and project deliverables.

Course website: www.cs.unr.edu/~dascalus/sp2008.html

Initial www pointers:

- The Object Management Group: www.omg.com
- IBM / Rational Software: www.rational.com

Several other addresses of websites that contain project-related resources will be indicated later by the instructors.

Grading scheme (subject to minor modifications):

- Project deliverables: **55%**
  - Concept (**P-I**) [3%]
  - Specification based on engineering standards (**P-II**) [7%]
  - Design with realistic engineering constraints (**P-III**) [7%]
  - Implementation, integration, and testing (**P-IV, P-V**) [38%]
- Project presentations and publications **25%**
  - Presentations (design, progress, workshop) (**PRES-I, II, III**) [8%]
  - Project website (**PWEB**) [6%]
  - Project video (**PVIDEO**) [6%]
  - Poster (**POST**) [5%]
- Midterm examination (**TEST**) **15%**
- Class participation (scheduled classes & workshop, **WS**) **5%**

Grading scale:

A	90 -100	[maximum 100]
A-	87 - 89	
B+	84 - 86	
B	79 - 83	
B-	76 - 78	
C+	73 - 75	
C	68 - 72	
C-	65 - 67	
D+	61 - 64	
D	56 - 60	
D-	50 - 55	
F	< 50	

Notes on grading:

- Requirements for grade A: at least 90% overall, at least 90% in class participation, and at least 60% in test
- To pass the course: at least 50% overall and at least 50% in P-IV and P-V
- There are no make-up tests or homework in this course
- Poor class participation can significantly decrease your overall grade

Late submissions:

Late submissions of assigned work will be penalized with a deduction of 10% of the grade per late day, to a maximum of two late days for each submission. No material will be accepted after two days past the deadline. For example, a project deliverable that is worth 90/100 points will receive 90*0.9 = 81/100 points if it is one day late. The same deliverable will receive 90*0.8 = 72/100 points if it is two late days and it will not be accepted if it is more than two days late. Note that late days are not divisible in subunits. Late days are not allowed for presentations, demos, and test.

On plagiarism and cheating:

Plagiarism and cheating will not be tolerated. It will be dealt with according to the policies of the University of Nevada, Reno regarding academic dishonesty. Please read these policies at www.unr.edu/stsv/acdispol.html

Legal notices on the world-wide web:

When accessing www resources such as downloadable software, technical reports, papers, on-line tutorials, etc., do not forget to read their accompanying legal notices and comply with their provisions.

Tentative Schedule CPE 426 Senior Projects in Computer Engineering Spring 2008

Week	Days (T, R)	Contents
1	Jan 22, 24	Course syllabus & Lecture on UML and UP
2	Jan 29, 31	Project group meetings
3	Feb 05, 07	Lectures on UML and UP Definition of project topics, P-I due 2/4/2008
4	Feb 12, 14	Lecture(s), Invited speaker P-WEB due 2/15/2008
5	Feb 19, 21	Lectures on UML and UP
6	Feb 26, 28	Lectures on UML and UP Project specification due (P-II) 2/25/2008
7	Mar 04, 06	Lecture, Project design presentations (PRES-I) Project design due (P-III) 3/7/2008
8	Mar 11, 13	Project design presentations (PRES-I)
9	Mar 18, 20	Project group meetings (pre-demos) Project poster (POST) due 3/17/2008
10	Mar 25, 27	*Spring break, no classes*
11	Apr 01, 03	Lecture & Midterm test (TEST) 4/3/2008
12	Apr 08, 10	Lecture & In-progress demos (P-IV) 4/09 & 10/2008
13	Apr 15, 17	Project progress presentations (PRES-II)
14	Apr 22, 24	Project progress presentations (PRES-II) Workshop preparation Project video (PVIDEO) due 4/21/2008
15	Apr 29, May 01	Project implementation, integration, and testing & internal project demos (P-V) 4/28 & 29/2008
16	May 02	Workshop presentations, demos, posters (WS, PRES-III) 5/2/2008

Course Assessment Matrix

CPE 426 Senior Projects in Computer Engineering

ABET Criterion 3 Outcomes	Course Outcomes	Assessment Methods/Metrics	CS Program Objectives Impacted	CIE Program Objectives Impacted
c	Students have the ability to specify, design and implement a complex computer system that has a significant hardware component.	Define project concept, elaborate requirements specifications based on engineering standards, perform use-case modeling, and develop high-level design, detailed design and user-interface design of the system taking into account realistic engineering constraints. Also, implement, integrate, test and demo the system.	2, 3	2, 3
d	Students operate in a project team to develop a product (system) needed in a specific area of human activity.	Work as a team to develop the project, gather and study appropriate resources (references) for understanding the project's application domain, and demonstrate the project's utility to the instructor, peers, and the general public.	2, 3	2, 3
e	Students have the ability to identify development needs and/or challenges that require computer-based engineering solutions and formulate such solutions.	Define a project topic of good utility and/or interest in a specific area of human activity, assess challenges related to developing the project, and propose technically sound design and implementation solution(s).	3	3
g	Students are capable of expressing their project solutions in clear and precise ways, both in writing and in public presentations.	Create project deliverables that include documentation and descriptions written in fluent, correct, clear and precise English. Develop a project website for public access. Present project work to peers as well as, at the end of the semester, to the general public (as part of the Annual CSE Senior Projects Workshop). Review peers' project work.	3, 4	3, 4
h	Students have a clear understanding of the impact of engineering solutions in a global and societal context	Examine and evaluate their own as well as peers' projects with respect to their engineering significance for society and the global community	1, 4	4
k	Students demonstrate the ability to apply a range of techniques and tools for developing computer systems.	Study and apply various engineering techniques, tools, and standards associated with the various phases and activities of the product life-cycle: requirements engineering, design, implementation, integration and testing.	2,3	2, 3

ABET Criterion 3 Outcomes:

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

Computer Science Program Objectives:

Our graduates will have achieved:

1. a broad general education assuring an adequate foundation in science and mathematics relevant to computing.
2. a solid understanding of concepts fundamental to the discipline of computer science.
3. good analytic, design, and implementation skills required to formulate and solve computing problems.
4. the ability to function, communicate, and continue to learn effectively as ethically and socially responsible computer science professionals.

Computer and Information Engineering Program Objectives:

Within 3 to 5 years of graduation our graduates will:

1. be employed as computer engineering professionals beyond entry level positions or be making satisfactory progress in graduate programs.
2. have peer-recognized expertise together with the ability to articulate that expertise as computer engineering professionals.
3. apply good analytic, design, and implementation skills required to formulate and solve computer engineering problems.
4. demonstrate that they can function, communicate, collaborate and continue to learn effectively as ethically and socially responsible computer engineering professionals.