

CS491,2 - SEMINAR: SOFTWARE ENGINEERING

Professor: Russell C. Bjork

Fall, Spring Semesters, 2007-2008

Mondays 4:30-6:00 pm

<http://www.cs.gordon.edu/courses/cs491-2>

Office: MacDonald 217 x4377
russell.bjork@gordon.edu

Hours: (Fall) MWF 2:10-4:00 pm;
Tu 1:30-2:30 pm and by appointment
(Spring) TBA

HANDOUT #1: SYLLABUS - 9/10/07

PREREQUISITE: Permission of the instructor

COURSE OBJECTIVES:

The primary goal of this course is to help you make the transition from the small-scale projects which have characterized your formal education to the kind of thinking and methodology needed for the medium and large scale projects which are typical in industry. Upon completion of this course, you should have a general familiarity with the principles of the branch of Computer Science known as Software Engineering; and you should have a working knowledge of some of the more important techniques that have grown out of software engineering research.

Tied in with this goal, this seminar will serve as a context in which you can complete the Senior Project required for your Computer Science major.

TEXT: Bruegge, Bernd and Allen H. Dutoit. *Object-Oriented Software Engineering: Using UML, Patterns, and Java*. (2nd ed) (Upper Saddle River, NJ: Prentice Hall, 2004)

RECOMMENDED: Brooks, Frederick P. Jr. *The Mythical Man-Month*. (Anniversary ed.) (Reading, MA: Addison-Wesley, 1995).

ON RESERVE: Brooks, Frederick P. Jr. *The Mythical Man-Month*. (Anniversary ed.) (Reading, MA: Addison-Wesley, 1995).

Schach, Stephen R. *Classical and Object-Oriented Software Engineering* (4th ed) (New York: McGraw Hill, 1999)

Shneiderman, Ben. *Designing the User Interface*. (Reading, MA: Addison-Wesley, 1998).

COURSE TECHNIQUE AND PROCEDURES:

This course is deliberately set up as a seminar, rather than as a traditional course. This implies that much of the content will come from your own study and project work, rather than from formal lectures by the instructor. The course will have a three-fold thrust:

1. Gaining familiarity with software engineering concepts through reading, oral presentations, and class discussion.
2. Using your senior projects as case-studies for applying software engineering concepts. Each student or team of students will present several formal reports to the class on their project at various milestones during the development process.
3. Learning how to make and evaluate formal written and oral technical presentations.

COURSE REQUIREMENTS AND EVALUATION:

Because this course is set up as two separate one-semester courses, each 2 credits, you will receive two separate letter grades during the course of the year. Each semester's grade will be based on four kinds of requirement to be completed during that semester:

1. **Reading and Discussion.** For most sessions, you are asked to read material in the main text by Bruegge, the recommended text by Brooks, and/or supplementary materials. In the case of reading in the Bruegge text, you should also look over the "Exercises" at the end of the chapter. For each reading assignment, you must prepare a summary of the major points (approximately one page), and must identify 2 or 3 questions you would like to see discussed in class. These may be used as a springboard for class discussion, and must be turned in at the end of the class for evaluation by the professor. (If the assignment involves more than one chapter, you should summarize each chapter individually, but prepare one set of questions for the entire assignment. Summaries for chapters from Brooks can be quite brief.)

Twice each semester, you will be responsible for leading the class discussion of one of the topics. There will be an opportunity to sign up for specific topics at the second class meeting.

Your journals and class discussion leading, together, will account for 20% of each semester's grade.

2. Throughout the year you will be preparing written documents plus making oral presentations in the process of doing your senior project, as shown in the course schedule. Note that, in most cases, you will turn in both a preliminary and a final version of each document. The final version must receive approval signatures from the user and/or departmental representative **BEFORE** you turn it in. (Your grade will be based on the final version.)

The Detailed Design/Code Sample Inspections are a bit different, in that each person/team will do this three times, and each time will only turn in one version of the document. (It is desirable for later review(s) to represent "fixes" to work reviewed earlier.) This will be distributed in advance to the class, and should represent a cohesive segment of your overall project with supporting documentation that enables the class to understand it and intelligently participate in inspecting it - cf. the discussion of "Peer Review" and "Inspections" in Bruegge §3.4.1 (p. 96) and §11.4.1 (pp. 450-451). The document you distribute should adequately prepare the class to do this.

Your grade on this document will be assigned by the rest of the class, based on the version given to them and the inspection in class. Note that you will not present this document; rather, the class will discuss it with you. Your oral presentation grade will be based on your participation in the review of other teams' work in the other sessions, not on the session in which your work is reviewed.

These documents and presentations will count in the course grade as follows:

Document	Document Weight	Oral Presentation Weight
Fall Semester		
Project Management Plan and Social Impact Statement. (Your senior project proposal to the department must also be turned in with the preliminary version. The talk should focus on the "What" and "Why" of your project, plus the SIS.)	5% + 5%	5%
Rapid Prototype	(not graded)	5%
Requirements Analysis Document	15%	10%
Preliminary User's Manual	*	(None)
* The document grade will be assigned when the intermediate version is turned in during the spring semester, but the preliminary version must be turned in for your fall work to be considered complete		
System Design	15%	10%

Spring Semester		
User's Manual	10%	(None)
Detailed Design/Code Sample Inspections	10%	10%
Test Plan/Report for another team's project	10%	5%
Completed Project	25% *	10%
* Based on conformity to specifications; final user manual; operation, user-friendliness, etc; and internal documentation and code quality.		

In preparing your oral presentations, please note the following:

- Each presentation is to be prepared for a different audience, which the rest of the class will simulate: management (“What and Why”/Social Impact Statement; Requirements Analysis Document); prospective system users (Rapid Prototype; final presentation); fellow technical personnel (System Design; Detailed Design/Code Sample Inspection, Test Plan/ Report). In the case of the final demonstration, you may wish to structure your presentation (at least in part) as a user-training session. If at all possible, your project “client” should be invited to attend the non-technical presentations, and CS Juniors will be invited to the final presentation as well.
- If your project is being done by a team, each member must participate in each presentation in a roughly equal fashion.
- The “What and Why”/SIS, Rapid Prototype, and Test Plan/Report presentations should be planned for about 15 minutes each. The Requirements Analysis, System Design, and Final presentations should be planned for about 30 minutes each. Each Detailed Design/Code Sample Inspection will be allocated at least 40 minutes (more if possible).
- In each case, this may mean that you will have to limit the scope of your presentation. It is better to cover a few aspects of your project well than to attempt to cover all aspects poorly. Your written documentation will show the professor how much you have actually accomplished, and will be the prime basis for evaluating the scope of your work. The purpose of the oral presentations is to give you practice with some of the kinds of presentation you may be called on to make in industry.
- You are expected to put good effort into all your presentations - graded or not.

Regardless of when you make your oral presentation, a complete draft of the required documentation must be turned in at the start of class on the day of the **FIRST** presentations. The professor will return this to you with suggestions for revision, and final written documentation must be turned in by the date shown in the course schedule below. Also, you must extract relevant excerpts from your written material to hand out to the class **BEFORE** your presentation. (Preferably, this should be handed out the week before your presentation but in any case **it must be distributed by hand or electronic mail so that everyone (students and faculty) who will be at the presentation has it by 5:00 on the preceding Friday**, so that they may look the material over in advance.) (Of course, there are no documents to distribute to the class for the rapid prototype and final demonstrations!) For the Detailed Design/Code Sample Inspection, you must get the documents to be inspected to everyone in the class by 5:00 on the preceding Friday.

NOTE WELL: ALL REQUIRED DOCUMENTS MUST BE TURNED IN COMPLETE AND (IN THE CASE OF FINAL VERSIONS) WITH THE NECESSARY SIGNATURES IN ORDER FOR YOUR WORK TO BE CONSIDERED COMPLETE. YOU CANNOT RECEIVE A PASSING GRADE IN THE COURSE IF ANY REQUIRED ITEM IS NOT SATISFACTORILY COMPLETED.

3. During the fall semester, you must turn in a personal resume and cover letter prepared in accordance with the process outlined in the resume writing session. This will be worth 10% of the semester's grade.
4. During the spring semester, you will be assigned to work with another student or team on the testing of their project - i.e. you will be do system testing of that student/team's project, and some other student or team will do system testing of yours. (This mirrors the practice found in many companies of having a quality assurance team assigned to a project that is separate and distinct from the development team, though the two teams work together on the same project.)

Based on a study of the documentation for the project you have been assigned to, you will prepare and execute a functional test plan, turning in both a copy of the plan and a test report, and you will make an oral presentation to the class on your work. In addition, you will give a copy of your test report to the student/team whose project you tested, so that they can utilize your findings to improve the final product.

5. There are tentative plans for student poster presentations in conjunction with the dedication for the new Ken Olsen Science center, and you will have an opportunity to present your project as part of this. Details regarding this should be available at the start of spring semester.

EXTENSIONS AND INCOMPLETES:

Due to the nature of the course, extensions and fall semester incompletes will be considered only in the most dire of circumstances and - by college policy - spring semester incompletes are **NOT** possible for seniors graduating in May. Thus, if it appears by mid spring semester that an incomplete will be necessary, then your graduation will have to be postponed until September. The department may postpone your graduation until September if you miss any of the due dates shown in the course schedule below, especially the milestone scheduled for the Monday after spring break. This is for your protection, since a postponed graduation is better than the risk of having to take an F for the course if your project is not completed by graduation. (September graduates may petition to participate in the graduation exercises with their class in May; but May graduates who fail must retake the course and cannot graduate until the next year.) If an incomplete becomes necessary, a fall semester incomplete must be made up by the start of classes for spring semester in order to continue registered for the seminar, and a spring semester incomplete must be made up by July 1 (for September graduation) or October 1. Otherwise, it will automatically become an F. Please note that, if you get behind early in the year, it will be very difficult for you to finish your senior project in time to graduate in May. You **MUST** keep up!

ATTENDANCE POLICY:

Attendance at all sessions is mandatory. Each unexcused absence will result in a reduction of 1/2 of a letter grade in the term grade.

ACCOMMODATION FOR STUDENTS WITH DISABILITIES:

Gordon College is committed to assisting students with documented disabilities (see Academic Catalog Appendix C, for documentation guidelines). A student with a disability who may need academic accommodations should follow this procedure:

1. Meet with a staff person from the Academic Support Center (Jenks 412 X4746) to:
 - a. make sure documentation of your disability is on file in the ASC,
 - b. discuss the accommodations for which you are eligible,
 - c. discuss the procedures for obtaining the accommodations, and
 - d. obtain a **Faculty Notification Form**.

2. Deliver a Faculty Notification Form to each course professor *within the first full week of the semester*; at that time make an appointment to discuss your needs with each professor.

Failure to register in time with your professor and the ASC may compromise our ability to provide the accommodations. Questions or disputes about accommodations should be immediately referred to the Academic Support Center. See Grievance Procedures available from the ASC.

TENTATIVE COURSE SCHEDULE - SUBJECT TO CHANGE:

Date	Topic(s)	Preparation
UNIT I: INTRODUCTORY CONSIDERATIONS		
M 9/10	What is Software Engineering?; The Software Engineering Code of Ethics	Bruegge ch 1; Brooks ch. 1,2 *; http://www.acm.org/serving/se/code.htm
	* For each chapter in Brooks, also read the corresponding section in ch. 18, where he reflects on his original writing 20 years later	
M 9/17	Joint session with other science division departments on job search strategies and resume preparation (Schedule discussion topics to lead)	None - but use this time to get ahead on reading assigned for next week!
M 9/24	Modeling with UML; Project Communication (Possible student-led discussion)	Bruegge ch. 2 (skim portions that are largely review for you; no journal required); Bruegge ch. 3 (read carefully/ journal); Brooks ch. 3, 6, 7, 16 *
M 10/1	Software Project Planning and Estimating; Social Impact Statement (Possible student-led discussion)	Bruegge ch. 14 through p. 595; Brooks ch. 8, 14 *; Shneiderman (on reserve) §3.8
		RESUME AND COVER LETTER DUE; SENIOR PROJECT TITLE, NAME OF CLIENT AND DEPT. SUPERVISOR DUE
UNIT II: REQUIREMENTS ANALYSIS AND SPECIFICATION		
M 10/8	Requirements Elicitation; Rapid Prototyping (Possible student-led discussion)	Bruegge ch. 4; Schach (on reserve) §9.2-9.5 (4th ed on reserve) or §10.13-10.15 (7th ed borrowed from professor)
		SENIOR PROJECT PROBLEM STATEMENT DUE

M 10/15	Senior Project “What” and “Why” / Social Impact Statement Reviews (Oral Presentations)	SENIOR PROJECT PROPOSAL DUE; PRELIMINARY SPMP AND SIS DOCUMENTS DUE
M 10/22	Analysis; Preliminary User Manual (Possible student-led discussion)	Bruegge ch. 5; Shneiderman (on reserve) ch. 12
M 10/29	Senior Project Rapid Prototype Demos (Oral Presentations)	FINAL SPMP AND SIS DOCUMENTS DUE; RAPID PROTOTYPE DUE
UNIT III: DESIGN		
M 11/5	System Design (Possible student-led discussion)	Read/journal Bruegge ch. 6 carefully; skim ch. 7 (no journal) paying close attention to anything that seems relevant to your project; Brooks ch. 4, 5 *
M 11/12	Senior Project Requirements Analysis Document Reviews (Oral Presentations)	PRELIMINARY REQUIREMENTS ANALYSIS DOCUMENT DUE; PRELIMINARY USER MANUAL DUE
M 11/19	Requirements Reviews (ctd)	
M 11/26	Rationale Management (Possible student-led discussion)	Bruegge ch. 12
		FINAL REQUIREMENTS ANALYSIS DOCUMENT DUE
M 12/3	Senior Project System Design Reviews (Oral Presentations)	PRELIMINARY SYSTEM DESIGN DUE
M 12/10	Software Configuration Management; Organization of Open Source Projects; Bug Tracking (lecture)	Bruegge ch. 13; spend some time browsing sourceforge.net and read the following: https://sourceforge.net/docman/display_doc.php?docid=9331&group_id=1
W 12/19	(End of fall semester final exam week)	FINAL SYSTEM DESIGN DUE
END OF FALL SEMESTER		

UNIT IV: IMPLEMENTATION

M 1/28	Object Design (Possible student-led discussion)	Bruegge ch 8-9 INTERMEDIATE VERSION OF USER MANUAL DUE
M 2/4	Implementation; Documentation Standards (Possible student-led discussion)	Bruegge ch. 10; Brooks ch. 15 *
M 2/11	Senior Project Detailed Design/Code Sample Reviews - Round 1 (Class Inspection of Documentation and Code)	SENIOR PROJECT OBJECT DESIGN / CODE SAMPLE DUE - TO BE DISTRIBUTED TO CLASS BY FRIDAY BEFORE EACH SCHEDULED REVIEW
M 2/18	Unit and Integration Testing (Possible student-led discussion)	Bruegge ch. 11 through p. 468
M 2/25	Detailed Design/Code Sample Reviews - Round 2	SAMPLE FOR REVIEW
M 3/3	User Interface Design (Possible student-led discussion)	Shneiderman (on reserve) ch. 1, 4
M 3/10	Detailed Design/Code Sample Reviews - Round 3	SAMPLE FOR REVIEW
SPRING BREAK + EASTER BREAK		
M 3/31	System Testing; Documenting Testing. (Possible student-led discussion)	Bruegge ch. 11 pp 469-end PROJECT NOTEBOOK WITH PRELIMINARY UNIT AND INTEGRATION TESTED, DOCUMENTED, WORKING VERSION OF PROJECT DUE, TO BE SUBMITTED TO THE USER, STUDENT TESTER, AND DEPARTMENT FOR EVALUATION. (Department gets full notebook; student testers get a copy of the the Requirements document and User manual, plus access to the software; user gets access to the software)

UNIT V: DELIVERY AND MAINTENANCE

M 4/7	Project Management; Starting Over. (Possible student-led discussion)	Bruegge ch. 14 (review portions read in fall; read remainder); Bruegge ch. 15; Brooks ch. 11 *
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M 4/14 Test Plan and Test Report Presentations (Oral Presentations)

**TEST PLAN, REPORT DUE;
(USER AND DEPARTMENT
COMMENTS ALSO
RETURNED TO TEAM)**

M 4/21 Post-Project Party plus Senior Project “Post-Mortem”

M 4/28 Senior Project Demonstrations (Oral Presentations)

**FINAL VERSION OF
EVERYTHING DUE!**

M 5/5 (ctd)

CONGRATULATIONS - YOU MADE IT!