CPSC270A
Software Eng & Project Design
Syllabus

Instructor: Dr. Durell Bouchard
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Course Objectives

Introduction to the principles of software engineering, software process models, requirements engineering, designing methodology and metrics, and testing and quality assurance. Students will apply these principles to the design and implementation of a large software project.

Intended Learning Outcomes: At the end of the course the successful student will be able to

1. design and implement large software projects using a suitable software process model.
2. review code for design, readability, and computational complexity.
3. create appropriate and thorough test cases for a software implementation.
4. use and understand the features of an integrated development environment including compiling, debugging, testing, and version control.

Course Content

In previous courses, you have learned how to create programs and analyze their computational complexity. These topics and skills provide the foundations for all other computer science classes. But real-world software projects are vastly larger and more complicated than the programs you created for these classes. Fortunately, there is an entire sub-discipline of computer science, software engineering, that is concerned with making the software development process easier. The software engineering techniques and tools you learn in this class will help you succeed in upper-level computer science classes, and more importantly, in software development work when you graduate.

Prerequisites: CPSC250

Text: *Clean Code: A Handbook of Agile Software Craftmanship*, by Robert C. Martin, Prentice Hall, 2008.

Activities: Activities during class give the student a structured experience in software engineering and increase the student's ability to use and understand the tools available for software development. The activities connect the reading and lectures to the practice of software development and prepare students for assignments. Activities must be completed during class to receive credit.

Assignments: Regular assignments are designed to reinforce class concepts. Assignments are due before the beginning of class. Late assignments will receive no credit.

Project: The focus of the course is a semester-long software development project. This project is designed to allow you to put together all of the software engineering tools and techniques skills you have learned throughout the semester.

Exam: There will be a comprehensive final exam on April 28 from 2:00PM to 5:00 PM.

Co-curricular: The Department of Mathematics, Computer Science, and Physics is offering a series of lectures designed to engage the campus community in discussions of ongoing research, novel applications, and other issues that face these disciplines. You are invited to attend all of the events but participating in at least three is mandatory. Within one week of attending an event, you must submit a one-page, single-spaced, paper (to Inquire) reflecting on the discussion. If you do not turn in the paper within the one-week time frame you may not count that event as one you attended.

Grading: Course grades are assigned based on the following weights and scale:

Grade Weights: activities…10% assignments…12% co-curricular…3%
project……60% final exam…….15%

Grade Scale:								
93-100	A	83-86	B	73-76	C	63-66	D
90-92	A-	80-82	B-	70-72	C-	60-62	D-
87-89	B+	77-79	C+	67-69	D+	below 60	F

Course Policies

Attendance Policy: Class attendance is vital to your success in this course; material covered during missed sessions is the responsibility of the student. Conversations held in class illuminate the published class materials and are subject to evaluation on the final exam. If you anticipate being unable to attend class, email me before class to be excused.

Make-up Policy: Everyone is expected to take the exam at the scheduled time. If you have an excused absence, email me to arrange for a make-up. Unexcused absences will result in receiving no credit for missed exams.

Late Assignment Policy: Unless otherwise specified, assignments are to be turned in before the start of class on the due date. If you anticipate being unable to meet a deadline, email me before the deadline to request an extension. Unexcused late work will receive no credit.

Academic Integrity: It is accepted that you have read and understood the standards for academic integrity at Roanoke College. All tests and exams are to be the work of the individual student. You are encouraged to get help from the instructor if you need help with any aspect of the course, including programs and assignments. Student assistants, tutors, and classmates may help you understand course concepts but may not show you how to do any particular aspect of an assignment. Students may discuss work and help each other out, but in all cases, the work you turn in must be your own. Copying someone else's work or turning in someone else's work is NEVER allowed. Using someone else's work or ideas as your own is plagiarism and an academic integrity offense. Examples of academic integrity violations include copying a program or part of a program (even one line) from someone else, writing code for someone else, telling someone else how to solve a problem or having someone tell you how to solve a problem. Discussion among students about programming projects should be limited to general concepts, not specific aspects of how to complete the work.

Computer Use Policies: All students must abide by the Computer Use policies of Roanoke College. Failure to do so will result in involuntary withdrawal from the course.

Electronic Devices: All cell phones must be silenced and stored out of sight during class. The use of any electronic device during a test or quiz is prohibited. This includes cell phones, personal media players, personal digital assistants, and laptops. Any use of such a device during a test or quiz will be considered a breach of academic integrity.

Subject Tutoring: Subject Tutoring, located on the lower level of Fintel Library (Room 5), is open 4 pm – 9 pm, Sunday – Thursday. We are a Level II Internationally Certified Training Center through the College Reading and Learning Association (CRLA). Subject Tutors are highly trained Roanoke College students who offer one-on-one tutorials in a variety of general education and major courses such as: Business, Economics, Mathematics, INQ 240, Modern Languages, Lab Sciences, INQ 250, and Social Sciences (see all available subjects at www.roanoke.edu/tutoring). Tutoring sessions are available in 15, 30, or 45-minute appointments. Feel free to drop by for a quick question or make an appointment at https://www.roanoke.edu/tutoring for a longer one-on-one appointment. For questions or concerns, please contact us at 540-375-2590 or subject_tutoring@roanoke.edu.

Accessible Education Services: Accessible Education Services (AES) is located in the Goode-Pasfield Center for Learning and Teaching in Fintel Library. AES provides reasonable accommodations to students with documented disabilities. To register for services, students must self-identify to AES, complete the registration process, and provide current documentation of a disability along with recommendations from the qualified specialist. Please contact Laura Leonard, Assistant Director of Academic Services for Accessible Education, at 540-375-2247 or by e-mail at aes@roanoke.edu to schedule an appointment. If you have registered with AES in the past and would like to receive academic accommodations for this semester, please contact Laura Leonard at your earliest convenience to schedule an appointment.

Diversity: I consider this classroom to be a place where you will be treated with respect, and I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability – and other visible and nonvisible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class.

Preferred Name/Pronoun: I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records.

Course Schedule

This course expects you to spend at least 12 hours of work each week inside and outside of class.

Week	Topics
1	Flutter & Dart
2	IDE & Version Control
3	Design & Requirements
4	Software Process Models
5	Code Quality
6	Code Reviews
7	Debugging
8	Testing
9	Refactoring
10	Design Patterns
11	Projects
12	Projects
13	Presentations