Syllabus

CSSE 371

Software Requirements Engineering

Fall 2022

Computer Science and Software Engineering

Rose-Hulman Institute of Technology

Class Sections and Instructors

Section 02
Schedule: MWF/10:00 – 11:50 AM/O259
Instructor: Mark Hays
Office: E205
Email: hays@rose-hulman.edu

Section 03-04
Schedule: MWF/1:00 – 2:50/O259
Instructor: Ben Jelen
Office: E207
Email: jelen@rose-hulman.edu

Section 05
Schedule: MWF/1:00 – 2:50/O169
Instructor: Gloria Liou
Office: D218
Email: liou@rose-hulman.edu

Course Prerequisite: CSSE 230 (Data Structures & Algorithms) or equivalent, RH 330 (Technical Communication) or equivalent, CSSE 333 (Introduction to Database Systems) & Junior Standing.

Course Description

Basic concepts and principles of software requirements engineering, its tools and techniques, and methods for modeling software systems. Topics include requirements elicitation, prototyping, functional and non-functional requirements, object-oriented techniques, and requirements tracking.

Course Text

1. Interaction Design: Beyond Human-Computer Interaction, Fifth Edition, by Jennifer Preece, Yvonne Rogers and Helen Sharp (**Required**)

Course Objectives

1. Explain the role of requirements engineering and its process
2. Determine the requirements of stakeholders using standard techniques
3. Decide scope, feasibility, and priorities of a product by communicating with stakeholders
4. Design and prototype user interfaces to validate requirements
5. Prepare and conduct usability tests to evaluate usability, utility, and efficiency of prototypes

Course Overview

This project-based course has gone through substantial revisions over the last five years. The course as you will experience it, places a lot of emphasis on intentional learning of the objectives mentioned earlier. You will gather requirements for incomprehensibly large software. The size and complexity of requirements associated with the projects will require that the team work together for an entire term to understand it completely. This project recreates a common situation where requirements engineering practices are not only immensely valuable, but contractually required. By the end of the

course, you will be practiced and well versed in a set of concrete techniques to productively establish the requirements of software.

This course is not coding-intensive. We will use code primarily as a tool to explore technical requirements. You will quickly realize that we would need at least a year full-time to "code the project" per se.

Not all situations call for the detailed requirements that students tend to produce in this course. You probably coded without such requirements during your summer internship and got along just fine. The key takeaway from this class is that there are situations (that employers tend to hide from interns) where writing code is not always the best place to start. The project you will work on is one of those situations.

Course Evaluation and Instructor Feedback

Feedback about the course is welcomed and may be provided through a Moodle link. We are not providing the option for anonymous feedback, instead we ask that you form your thoughts constructively and calmly and send them to us with your name attached. Learning how to give feedback in a constructive, professional way is a key to working with other people in a professional environment, and this is a great time to practice. We will respond to feedback in the next class session. Even though feedback will not be anonymous to us, we will not use your name in class when we address the feedback.

Teaching Assistant Feedback

Please feel free to provide us direct feedback about the teaching assistants associated with the course at any time. An anonymous feedback activity under the Moodle account for this course will be available for feedback throughout the course; we typically check it once a day and we will try to respond to your feedback during the next class session.

Student Feedback

Students have mentioned in the past that other students in the class have actively impeded their work in the class. This could be in the form of harassment, constantly disrupting their ability to work, and/or disrupting the class. If any student in the class makes you uncomfortable, please feel free to provide us direct feedback at any time. An anonymous feedback activity under the Moodle account for this course will be available for feedback throughout the course.

Learning Toolbox

Learn how to succeed in this course by following these tips.

Course Materials

Other than the book, all of the course materials including lecture slides, homework, case studies, and project milestones are posted on Moodle. Your grades and instructor communications are also done through Moodle, as well as feedback for some assignments. We will also use a custom tool called Requirements Manager to provide some feedback, and instructions will be provided on how to access this. **If you are told there is feedback and cannot find it or it feels lacking in detail, let us know ASAP.** This is a good time to practice communication to get more clarity, but often it's

simply the case that Moodle put the feedback in an odd spot that it hasn't for other courses and students didn't know where to find it. Continuing without the provided feedback *will* be detrimental to your grade.

What is the student's responsibility in the learning process?

- **Accept sole responsibility** for your learning in this course.
- **Actively read** the assigned text before class.
- **Start early**: Make an initial attempt to start your assignments the day they are assigned. Get a sense for the difficulty and the concepts involved, as well as the time each may take to complete. Assignments in this class *cannot* be completed in a single evening.
- **Ask questions early**: In industry, **asking questions during requirements engineering activities is a sign of experience, not weakness**. Berenbach, a requirements engineering expert, applauds the "smart ignoramus" for asking questions that other people assume have an obvious answer. Feel free to ask the instructor or TA about any questions you have. Bring your marked-up textbook and your reading notes.
- **Take notes during group discussion and lecture**: anything discussed in class is fair game for the exam.

How would an experienced learner read a text in your course?

We won't always have assigned reading, but when we do, **expect each day's reading to take you three to six hours**. This is consistent with the old rule of thumb that an hour of class requires three hours of study. Here are some tips to succeed with your reading assignments:

- **Spread it out**: the reading should take multiple sessions. You can't remember it all in one sitting.
- **Preview**: Skim once to read the headings. Read the discussion questions. Write the questions down at the top of your notes.
- **Read Actively**: Fully read each section. Take notes on what is being discussed in that section.
- **Create Questions**: Invent your own study questions as you read. Write them down as you go.
- **Review and re-read**: Write down the big-picture idea for the chapter. Try to answer your study questions solely from memory - when you reach this point, you "did the reading." Otherwise, go back and re-read what you missed.
- **Discuss**: Discuss your answers to the reading quiz questions with a study group. Come prepared for class discussion.

Do you encourage study groups?

Yes! Both for daily readings and for exam preparation. Complete your reading of the material and write your study questions before meeting with your study group. Test each other by swapping the

study questions you each wrote as part of the reading. If you go to your study group unprepared, you could hurt the other students by posing inadequate questions.

How should students prepare for the exam?

- **Re-read** the notes you took in class and on the reading assignments.
- **Review the reading quizzes**. Reflect on why you selected your answers. Also reflect on the significance of the questions in forming your understanding of the reading.
- **Test your peers** by asking them the study questions that you created from the reading.
- **Practice** the various requirements elicitation and management techniques that you were taught/employed in the homework assignments and/or project deliverables.

How should students prepare for the project?

In order to complete the project successfully, it is necessary for the team to work on several tasks at the same time. Each task has a significant lead-time – for contacting a stakeholder, reviewing a document, or simply careful deliberation. Do not expect to complete a milestone if you haven't started working on it at least a couple of weeks before it is due. All of this requires that steps be planned and that the plan be monitored. The project schedule should help you get started on a plan.

Course Grade Determination

Items	Weight
Final Exam	30%
Project	40%
Homework	15%
Class Participation and Daily Quizzes	15%

Your grade in the course will be determined based on the quality of your individual and team work in each of the course learning outcomes. To earn a passing grade in this course, you need to individually demonstrate proficiency in **exams (at least a C average) and the project (at least a C average)** to the satisfaction of the instructor. You can demonstrate individual proficiency in a variety of ways, although exams offer the most compelling evidence. On assignments and projects which involve teamwork, there is a difference between the grade obtained by the team and the grade obtained by the individual student. Team's grade reflects the entire work product produced by the team, while the individual's grade will reflect individual contributions to the artifact, conduct in client and team meetings, work done during client meetings and other communications (email, verbal etc.). As such, there are plenty of circumstances where an individual's grade can be drastically different than the team's grade.

Assignment Grades

Each assignment will describe its grading scale.

Assignment grades in this course are entered into Moodle on a GPA scale:

- F (Fail): 0.0

- D (Deficient): 1.0
- C (Satisfactory): 2.0
- B (Very Good): 3.0
- A (Excellent): 3.6+

The small gap between an F and a D lends opportunities to recover from failure.

Initial Revision

In this course, students tend to learn best by making mistakes and receiving feedback that they made mistakes. To facilitate this conversation, every homework and project will list initial deliverables that are due halfway through the assignment. Your instructor will identify the mistakes that you made so that you can correct them in your final submission. Your instructor may show your work, anonymized, to the whole class so that they can learn from your mistakes.

Exams build on techniques applied on in-class work, homework, and projects - consider those assignments your intermediate reviews for your exams.

Failure to submit an assignment for initial review will result in a letter grade deduction on the final submission.

Professional Behavior

Students are expected to behave professionally. A lack of professional behavior in a student's interactions within a team, with the client, other stakeholders, instructor, teaching assistants or during in-class activities can result in a penalty grade. Depending on the nature or egregiousness of the behavior, the penalty grade **might be a reduction in letter grade or an F in the class**.

Academic Misconduct

If you **plagiarize any part of your work or take part in any form of academic misconduct (including hindering the work of other students), you will automatically receive a grade of 'F'** for the class and the incident will be reported for further disciplinary action. See the Collaboration policy below for details.

Self-plagiarism

Students who turn in work derived from a past attempt at the course shall receive an F in the course.

Self-plagiarism is copying and reusing all or some of your previous work for another course attempt. There are several problems with reusing your own work: 1) It probably wasn't of high quality (since you're here retaking the course), 2) It gives you a time advantage over other students, and 3) You are not learning the material by resubmitting existing work. While all of these are significant issues, the last one is our biggest concern. If you are retaking a course, you should be redoing the work, as the practice helps reinforce course concepts. **Self-plagiarism will be treated as any other form of academic misconduct.**

Miscellaneous

Syllabus Changes

Please note that the syllabus is a living document. We reserve the right to change the syllabus at any time, but you will be alerted to any changes.

Attendance Policy

Up to two unexcused absences are allowed. Any additional unexcused absences may result in you receiving a failing grade for the course. You are responsible for making up any missed work.

COVID Policy

Participation in Rose degree programs is an agreement to adhere to the policies of the institute. Refer to Institute policy for more information: COVID-19 | Rose-Hulman.

Laptop Policy

You may need to use your laptops during a portion of each class period. Please be sure to bring your laptop and a power brick to class.

During class discussion, please do not use your laptops. Laptop use during discussions is distracting to your classmates and also keeps you from focusing on the material. If you typically use your laptop for note taking, please talk to your instructor so he/she can make an exception.

Collaboration

An outcome of this class is to collaborate in your project work, including doing this in new ways. Very much something we want!

You are encouraged to discuss the homework and other parts of the class with other students. Such discussions about ideas are not cheating, **whereas the exchange of code or written answers is cheating**. However, in such discussions of ideas, you should distinguish between helping and hurting yourself and the other student. In brief, you can help the other student by teaching them, and you can hurt them by giving them answers that they should have worked out for themselves. The same applies to tutoring and getting help from the instructor.

If you use reference materials (other than the course texts) to solve a problem, please cite the referenced material. Similarly, if you discuss a solution with another student, give credit where credit is due by making a note such as "the following idea was developed jointly with Alyssia P. Hacker," or "the following idea is due to Ben Bittwiddle." You cannot be charged with plagiarism if you cite in this way. (However, don't expect to excuse cheating with such a citation. That is, you cannot exchange code even if you say it was developed in cooperation with someone else. Cooperation refers to the exchange of ideas, not code or written answers.)

The instructors take plagiarism seriously. **Students caught plagiarizing, or cheating in any way, will be reported to the dean of students and will receive an automatic F in the class.**

Late Submissions

Late submissions of any form will not be accepted. You can arrange with your instructor ahead of time for a delayed submission. **Note that there are no "late day" credits. In industry, where you are preparing to spend most of your career, such things don't exist.**

General Writing Issues

Written communication is important in this course, as it is in the profession in general. Remember that a software document has several unique and important characteristics:

1. Technical documents are often the result of group authorship, thus it requires planning and final tweaking.
2. Specificity and organization are more important than flow; hence technical documentation is often ordered around lists and tables rather than paragraphs.
3. Documentation is often the reader's only source of information on the particular subject or product; hence it must be thorough and complete.
4. Documentation is often used to answer a specific question; hence it should facilitate finding a specific piece of information (navigation).
5. Documentation must bridge from general specifications to particulars of implementation and operation, hence it must make abstract concepts concrete and make concrete facts fit generalized concepts.
6. Documentation can be presented in many forms: online via HTML, wiki pages, help files, just plain text, and on paper as reference manuals, tutorial, quick reference guides, etc. It is important to choose the correct medium and even more important to write to fit the medium.

You can always drop by your instructor's office if you have any questions regarding your document. **We would be happy to look at it and suggest some changes**. You should also be aware of the service provided by the Learning Center. The Learning Center has dedicated staff to help review and suggest revisions on your submissions. **We reserve the right to immediately return an artifact as an automatic failure if it is obvious that the artifact has not been reviewed before submission. This will result in a reduced grade for the artifact upon resubmission.**

Peer Feedback

At midterm and the end of the term, we will be soliciting feedback from your other team members. We expect feedback given here to be constructive. This feedback will be factored into your grades per Professionalism.

Students with Accessibility Needs

Rose-Hulman is committed to working with students who have special needs or disabilities. Visit the Accessibility Services website for more information. Requests for academic accommodations must be documented with and approved by the Accessibility Services office before they can be implemented in this course.

Academic Integrity:

The Student Handbook and Rose-Hulman's Academic Rules and Procedures describe penalties and processes invoked as a consequence if academic misconduct (such as cheating, plagiarizing, or interfering with the academic progress of other students) takes place. It is the responsibility of each student to know and follow Rose-Hulman's rules about academic integrity.

Diversity Statement:

Rose-Hulman Institute of Technology is committed to being an inclusive community in which the multiplicity of values, beliefs, intellectual viewpoints, and cultural perspectives enrich learning and inform scholarship.

Online Access Requirements:

Rose-Hulman welcomes students from around the world, and encourages faculty, staff and students to travel around the world. However, geopolitical conditions and compliance with export law and regulations prevent us from delivering certain kinds of educational experiences and/or using certain kinds of Institute technologies in some locations. For example, students in locations with limited access to the internet in general, or with restricted access to portions of the internet, or which are embargoed by the U.S. Directorate of Defense Trade, may not be able to successfully complete Rose-Hulman courses.

Emergency Information:

To receive email or text messages regarding emergency situations that may impact campus and, possibly, the delivery of classes, register for RAVE alerts and/or follow @Rose-HulmanAlert on Twitter. Any announcements about the Institute's ability to offer classes will be shared on Rose-Hulman's website.

Syllabus developed by Mark Hays, Ben Jelen, and Gloria Liou, Fall 2022, with previous work contributed by Amanda Stouder and Sriram Mohan.