

Inver Hills Community College
CS 2000 Systems Analysis and Design
Fall 2005 (revised October 17, 2005)

Credits: 3 Semester Credits
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Text/Supplies

Required:

Applying UML and Patterns; An Introduction to Object-Oriented Analysis and Design and the Unified Process – 3rd Edition; Craig Larman, Prentice Hall PTR

Recommended:

How To Make Meetings Work, Michael Doyle, David Straus, Berkley Books
UML Distilled, 2nd Edition, Martin Fowler, Addison Wesley

Course Objectives

This course is designed to provide students with an understanding of the software development process, with an emphasis on the requirements and analysis disciplines. Students will gain exposure to an iterative software development process and develop the requirements and analysis artifacts through use of the Unified Modeling Language (UML) and a visual modeling (a.k.a. UML or CASE) tool.

At the end of this course, students will be sufficiently prepared for an entry-level System Analyst position. Students will be exposed to the Requirements discipline and learn to develop the artifacts that are necessary to specify the functional and non-functional requirements, such as a use case model, system use cases, glossary, supplemental specification, and activity diagrams. Students will also be exposed to the Analysis and Design discipline and develop domain models, class diagrams and sequence diagrams.

The emphasis of this course is on object-oriented and iterative methods. However, structured analysis and design techniques will also be discussed so as to round out a student's knowledge.

Prerequisite(s)

CS 1100: Introduction to Computer Science
CS 1110: Intro to Java OR CS1119: C++ Programming

Evaluation/Grading

Assignments are based on the following percentages:

90 – 100%	A
80 – 89%	B
70 – 79%	C
60 – 69%	D
Below 60%	F

The grade will be calculated using the following distribution:

Project (60%):

As mentioned earlier, the thrust of this course is to learn the principles of object oriented methods and iterative development by producing the artifacts for a simulated software system in a team-based environment. We will develop this project using the Unified Process as described in the text. Completion criteria for all artifacts will be discussed in class, and there will be ample time for you to review your work with me before the due date. The phases and deliverables for the project are as follows:

Inception Phase – 20%:

For this phase, you are to complete the artifacts that describe the system scope and its basic requirements and constraints. I will provide you with templates for the deliverables, but you may use your own provided your team and I approve them in advance. Deliverables include:

- A project glossary. I will start one, but you must update it with the new terms.
- A use case survey. I will start one, but you must add to it the additional use cases you have identified from the vision document (which I will provide for you) and/or discussions with the Project Stakeholder.
- A supplemental specifications document. I will start one, but you must add 6 additional requirements.

Elaboration Phase: 80%

The emphasis of this iteration is to develop the architectural baseline, which we will simulate through use case reports, use case dependency graph and UI prototypes. An architectural baseline requires a firm understanding of the projects functional and non-functional requirements. This phase will have three iterations, each one building on the one prior to it.

The deliverables for first iteration are the primary set of requirements artifacts, which include:

- Updated artifacts that were developed in the Inception Phase.
- For ½ of the use cases:
 - Detailed use case reports.
 - A data definition document. I will start one, but you must complete it.
 - An error / status message document. I will start one, but you must complete it.
 - A UI mockup.
 - An activity diagram.

The deliverables for the second iteration are the primary set of design artifacts, which are as follows:

- Updated artifacts from the first Elaboration phase.
- For the remaining use cases:
 - Detailed use cases.
 - A data definition document.
 - An error / status message document.
 - A UI mockup.
 - An activity diagram.
- An initial domain model. I will start one, but you must add to it the conceptual classes for at least ½ of the system.
- An initial use case dependency graph.

The deliverables for the third iteration

- Updated artifacts from the second Elaboration Phase.
- A completed domain model.
- A completed dependency graph.
- An initial class diagram. I will start one, but you must add the design-level classes that are needed to implement three of the use cases.
- At least one sequence and/or collaboration diagram for the basic flow for the use cases you choose to include in your class diagram.

- A 15-20 minute presentation of your deliverables. The presentation must include a detailed discussion of your use case diagram, domain model, class diagram, and your sequence diagrams. You must also share with the class the challenges you came across, technical as well as non-technical. Each presentation will be followed by a 5-10 minute class discussion.

Final (20%):

An effective OO Modeler requires superb analytical-thinking and writing skills. For this assignment, you are to review and comment on a position paper that proposes an alternative approach to the analysis techniques we learned in class. You can either support or refute the author's position. The position you take (support or refute) is not terribly important. What is important is how effectively you research and support your positions. Your grade will be determined by how convincing your positions are, along with how clearly and concisely you are able to express them. Other details about the paper will be discussed in class.

Participation (20%):

When I was a student, I found nothing more boring than to have to sit and listen to the same person talk, hour-after-hour, class-after-class, so I won't subject you to that kind of torture. More importantly, as a Systems Analyst / Designer, you will often be challenged and asked to provide your opinion or explain the system rational. You may in turn ask the same of others. There will be numerous in-class exercises and group discussions. Your participation in these efforts will play an important role in determining your grade as well as adding to a lively and rewarding classroom experience. Just as I ask you to tell me if you have a teammate that is not performing, I won't wait until the last minute to tell you either. If I feel that you are not participating to the level that your classmates are, I will let you know and give you plenty of time to rectify the situation (if you so desire).

Extra Credit (15 points):

Implement (code) your initial design and provide a demo of it in class. Add to your presentation the challenges you faced when mapping your design to code.

Policy/Procedures

Team Grading:

Being exposed to the challenges of working on a team project is one of the most important learning experiences from this course. Why? As we'll see in class, working in team is more often than not the way projects are done in the real world.

It is my hope that you select a team that you are comfortable with, but this may not always be the case. If for some reason you are unable to work with your teammates, it is your responsibility to speak to me as soon as possible. I will schedule time with your team and most likely ask you to find a way to resolve your differences. If your team does not come up with a unanimous decision, I will decide for you and my decision will be final. Note: under no circumstances will I insist that you continue to work together as a team. In the event that I split up the team, one or more of you may need to a) find another team or b) work independently. For the former, it is your responsibility to find another team and they must approve of the addition. For the latter, you will still be held accountable for all of the work a team would have to produce. Note: in all cases it will be you and/or your team's responsibility to meet project deadlines.

Unless I am instructed otherwise, your teammates will all be given the same grade. If you feel that an equal distribution is not fair, talk to me and we will discuss it. Any decision regarding grade distribution will only be made after I hear all sides of the story. A word of caution: don't wait until the last minute to talk to me. There is plenty of time for your team to plan your activities and determine who is not delivering on their commitments.

Missing a Deadline.

Deadlines are a part of life, but so are unforeseen events. If you feel you are going to miss a deadline, let me know ahead of time and we'll talk about it. In fairness to the students that completed their assignments on time, I might knock your grade down, but how much depends on how quickly you tell me and how quickly you are able to get back on track.

Under no circumstances can your team presentation be late. If you are not done, you must at least present the work you have done. The same goes for the final exam.

Missing a class.

If you must miss a class, it will be considered excused if you inform me before the class. One excused absence is not likely to affect your participation, but two or more certainly will. If you are unable to notify me of an absence ahead of time, please do so at the earliest possible moment after the class. Unforeseen events do happen, and the impact on your class performance will be determined on a case-by-case basis. Habitual, unexcused absences will surely impact your participation grade.

Incomplete Grades.

I will not grant requests for incomplete grades; an exception will be considered for extraordinary circumstances (e.g. car accident, funeral, etc.).

Open Lab.

All assignments may be done in the IHCC computer lab located on the first floor of the library. Check the posted schedule for hours.

Software.

The CASE tool will be Rational Rose. A copy of it will be made available to you at no charge and you must return your license along with the Final Exam. Failure to do so will be reported to the Dean and appropriate action will be taken.

You may use another CASE tool if you wish, but you must get my approval as well as your teammates.

The other deliverables will be Microsoft Word documents. I use Word 2000, and I have not experienced any compatibility problems with other versions. If you encounter compatibility problems, it is your responsibility to inform me at the earliest possible moment.

Academic Integrity.

Cheating and plagiarism will not be tolerated. The student(s) involved will be failed for the entire course.

Withdrawal from Course.

Students who stop attending but do not withdraw from the course will receive a failing grade for the course. Students may choose to withdraw because the coursework may be too overwhelming or academically challenging at this point in time. Students must initiate requests for a withdrawal from the course by filling out the appropriate paperwork in Records/Registration. The last day to withdraw from this class is **TBD**

Audit of the Course.

A student may decide to take a class for audit instead of a grade. Students who wish to audit the class can do so by filling out the appropriate paperwork with Registration by the 10th day of the semester; the instructor's signature is required on the audit form.

Students with Special Needs.

I would like to make sure that all the materials, discussions and activities that are part of the course are accessible to you. If you would like to request accommodations or other services, please contact me as soon as possible. It is also possible to contact the Disability Services Office, L-224; phone, 651/450-8628; TTY, 651/450-8369.

Outline of Class Activities

Notes:

1. ***During your reading you may come across terms, diagrams or concepts that are new to you – particularly in the first few weeks. Do not panic, we'll go over everything in class.***
2. I will assume that you have read the material prior to the class. That way, I can start each class with a question/answer session, and then supplement the material with additional material and/or sections of the reading that I want to highlight.
3. Deliverables marked in ***bold italic*** text are due on the date indicated. Anything provided to me later than the specified due date is a candidate for a late penalty. Optional deliveries are marked in clear text, but it is to your advantage to ask for frequent feedback.
4. Regarding feedback:
 - a. I will make every effort to give you feedback in a timely manner (anywhere from on the spot to 24-48 hours). How fast I can get back to you depends on the nature of your questions, the number of teams ahead of you, etc.
 - b. For weeks that a deliverable is due, I will accept questions up to Noon, the Sunday before the due date. Exception: for the last week of class, I will accept feedback up 5:00 PM, Tuesday December 14th.
5. Most classes, except for the first few will be designed so that there is plenty of lab time. I encourage you to use the lab time to work on your project or to elicit feedback from me, but how you use the lab time is completely up to you.
6. This outline may change if circumstances warrant it, such as school closings. If a guest speaker becomes available, an appropriate adjustment will be made as well.

Date	Goals	Assignments	Deliverables
8/25	<ul style="list-style-type: none"> • Course, class, instructor, and student introductions. • Review syllabus. • Introduction to the systems development lifecycle, methodologies, and systems analysis. 	<ul style="list-style-type: none"> • Read Preface, Chapters 1,2, and handouts. Skim sections on Agile Methods. 	<ul style="list-style-type: none"> • None
9/1	<ul style="list-style-type: none"> • Discuss Unified Process and Iterative Development • Begin discussion on requirements, types of and techniques for documenting them. • Discuss team selection / class mixer 	<ul style="list-style-type: none"> • Read chapter 3, 4, 5 and handouts • Think about team selection 	<ul style="list-style-type: none"> • None
9/8	<ul style="list-style-type: none"> • Discuss class project • Introduction to use case modeling / use cases • Demo on Rational Rose – Use Case Diagram 	<ul style="list-style-type: none"> • Read chapter 6 and 7. • Review project artifacts. • Install Rational Rose. • Read handout on use case guidelines 	<ul style="list-style-type: none"> • <i>Team selection / team name</i>
9/15	<ul style="list-style-type: none"> • Continue discussion on class project • Continue discussions on use cases and supporting artifacts: data dictionary and message document. • Discuss usability / user interfaces 	<ul style="list-style-type: none"> • Review Usability website (TBD) 	<ul style="list-style-type: none"> • Inception Phase (I1) checkpoint (optional)
9/22	<ul style="list-style-type: none"> • Additional use case / use case modeling topics. 	<ul style="list-style-type: none"> • Update supplemental specification 	<ul style="list-style-type: none"> • UI prototype

Date	Goals	Assignments	Deliverables
	<ul style="list-style-type: none"> Continue discussion on the project. Demo on Rational Rose – Use Case Diagram 	<ul style="list-style-type: none"> Update vision document. 	
9/29	<ul style="list-style-type: none"> Discuss Activity Diagrams Demo with Rational Rose – Activity Diagrams 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> <i>Inception Phase artifacts due</i>
10/6	<ul style="list-style-type: none"> Review object oriented concepts Discuss Elaboration Phase goals, activities, and artifacts. Rose demo 	<ul style="list-style-type: none"> Complete remaining Inception Phase artifacts Read chapter 8 	<ul style="list-style-type: none"> Elaboration Phase 1 (E1) checkpoint (optional)
10/13	<ul style="list-style-type: none"> Introduction to Domain Modeling 	<ul style="list-style-type: none"> Read chapter 9 	<ul style="list-style-type: none"> E1 / E2 checkpoint (optional)
10/20	<ul style="list-style-type: none"> NO CLASS 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> None
10/27	<ul style="list-style-type: none"> Continue discussions on Domain Modeling (attributes and associations) Rose demo Handout and discuss final exam 	<ul style="list-style-type: none"> Read Domain Modeling Guidelines Begin domain model. 	<ul style="list-style-type: none"> <i>Elaboration Phase 1 due.</i>
11/3	<ul style="list-style-type: none"> Introduction to design: class and sequence diagrams. Review E1 artifacts 	<ul style="list-style-type: none"> Read chapters 15 and 16. (<i>Just skim these chapters for now</i>) 	<ul style="list-style-type: none"> E2 checkpoint (optional)
11/10	<ul style="list-style-type: none"> Class and sequence diagrams (cont'd) 	<ul style="list-style-type: none"> Re-read chapters 15 and 16 Begin initial class diagram and sequence diagrams 	<ul style="list-style-type: none"> E2 / E3 checkpoint (optional)
11/17	<ul style="list-style-type: none"> Continue discussions on OO Modeling (GRASP Patterns) 	<ul style="list-style-type: none"> Read chapter 17 Put finishing touches on the final, your deliverables and presentation. 	<ul style="list-style-type: none"> <i>Elaboration Phase 2 due</i> E3 checkpoint (optional)
11/24	<ul style="list-style-type: none"> NO CLASS – HAPPY THANKSGIVING 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> E3 checkpoint (optional)
12/1	<ul style="list-style-type: none"> Introduction to Structured Techniques 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> E3 checkpoint (optional)
12/8	<ul style="list-style-type: none"> OPEN – TOPIC TBD 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> E3 checkpoint (optional)
12/15	<ul style="list-style-type: none"> Discuss Elaboration Phase artifacts – general observations and team-by-team. Group discussion / FIESTA! 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> <i>Presentations Due</i> <i>Elaboration phase 3 due</i> <i>Final Exam due</i>