

CSCI 234: Introduction to Software Engineering

Syllabus: Spring 2014

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Course Description

An introduction to professional software development using object-oriented techniques. Topics include the use of object-oriented design as a tool for building correct and maintainable software systems, test-driven development, best-practices in object-oriented design and development informed by component-based engineering, advanced object oriented language features, and languages for communicating design.

Course Objectives

Upon completion of this course, a successful student will be able to:

- Design class hierarchies to meet software-level specification using object-oriented design principles and appropriate use of polymorphism, encapsulation, and inheritance.
- Recognize common design idioms and patterns in existing software and use design patterns to aid in the design of new software.
- Communicate software design using UML.
- Evaluate object-oriented designs using best-practices, support for local reasoning, and metrics of coupling and cohesion.

Required Texts

In addition to the following texts (available in pdf format in the class Google Drive folder), supplementary readings will be given periodically during the semester.

- *Head First Object-Oriented Analysis and Design* by Brett D. McLaughlin, Gary Pollice, and David West
- *Head First Design Patterns* by Eric Freeman and Elisabeth Freeman

You should expect to spend one to two hours before each class session working through the readings. This means reading the text for detail, studying the design concepts, and working to learn vocabulary – not just skimming through the material before class.

Graded Material

Below is a brief description of each of the assignments for the course. In class I will hand out detailed descriptions of the requirements and grading guidelines, as appropriate.

- **Written assignments** – This catch-all category covers everything from traditional homework problems to written reports and journal assignments. Most assignments will be graded in class the day they are due, and thus will not be accepted late. The grade scale is as follows:

- 3 – The solution is perfect or near perfect.
- 2 – The solution has some errors or omissions but was headed in the right direction.
- 1 – The solution has significant errors or omissions, but a serious attempt was made.
- 0 – The solution shows little progress or the problem was not attempted.

At the end of the semester, your average homework grade will translated to a letter grade as follows:

≥ 2.5	A
≥ 2	B
≥ 1.5	C
≥ 1	D
< 1	F

- **Online Discussion** – Each week a new discussion topic will be posted to the Software Engineering Discussion Google Group (shared with CSCI 334). The topic will include two or more readings and a set of questions for the two classes to discuss.
- **Online Moderation** – Working in pairs or trios, you will develop and then moderate one discussion topic during the semester.
- **Merck, OpenMRS, and SunGard** – Throughout the semester, we will work with employees at Merck to make contributions to the open-source project, Open-MRS. In addition, you will observe the software process as it is applied at SunGard, a local software development company. Your grade will be based on your level of contribution to OpenMRS and a collection of written responses to your visits to SunGard. These projects will be completed along side students from CSCI 334.
- **Projects** – Working in a small team, you will design and implement a complete software system. Your grade will be based on your contribution to the team as well as your post-mortem analysis of how the software design process was applied.
- **Reading** – The two books for this course are incredibly easy to read and contain a number of high-quality exercises within the text. For each reading assignment, you will self-assess how well you prepared using the following scale:

- 3 – You did the reading and all the exercises within the text.
- 2 – You completed the reading, but didn't do all the exercises.
- 1 – You did most of the reading, but not all of it.
- 0 – You either didn't to the reading, or only did a little.

At the end of the semester, your average score for all reading assignments will be translated into a letter grade using the following scale:

≥ 2.5	A
≥ 2	B
≥ 1.5	C
≥ 1	D
< 1	F

- **Participation** – Half of your participation grade is determined solely on your attendance in class (irregardless of whether an absence is excused). The other half is based on active participation. I believe that we learn better when we are *actively* engaged in the material. Therefore, I expect you to participate in the activities in class and contribute on a regular basis.
- **Midterm** – One midterm will be given during the semester. The tentative date for this test is Wednesday, February 26. You may only re-schedule this test for college-approved absences or documented illness. In either case, you must contact me *before* the beginning of the test.
- **Final** – The final will be cumulative and will be given in-class on Monday, April 28 at 1:30 p.m. Any change to the final exam schedule must be approved by both me and the dean of students.

Grade Determination

- (10%) Written Assignments
- (15%) Online Discussion
- (10%) Online Moderation
- (15%) Merck, OpenMRS, and SunGard
- (15%) Projects
- (5%) Reading
- (5%) Participation
- (15%) Midterm
- (10%) Final

All grades will be calculated on the standard scale using pluses and minuses.

Course Policies

- **Late Policy** – I understand that life sometimes gets in the way of getting work done. Consequently, late assignments will be accepted without penalty in the class after the assignment is due. However, this policy should not be used as a crutch, and if you frequently use it I will deduct from your grade. After the next class session, late work will not be accepted unless there are exceptional circumstances.

- **Extensions** – In a similar vein, I am generous with extensions on work if you approach me *before* the day the assignment is due.
- **Absences** – Your attendance is expected at each class meeting, but I understand that students occasionally get sick, have obligations outside Moravian, and even over sleep. If you do miss class, please send me an email explaining your absence – preferably before the class session. Regardless of your reason for missing class, you are responsible for the contents of reading assignments, handouts, class activities, and class email.
- **Academic Honesty** – Except on tests, you are *encouraged* to discuss the material and work with other students in the course. This policy does not allow you to copy another student’s work verbatim – you must produce your own code or write-up of the material. Work together to learn the concepts, but keep in mind that you are ultimately responsible for the material on the tests.
- **Disabilities** – Students who wish to request accommodations in this class for a disability should contact the assistant director of learning services for academic and disability support at 1307 Main Street, or by calling 610-861-1510. Accommodations cannot be provided until authorization is received from the Academic Support Center.

The details of this syllabus and schedule are subject to change based on our progress through the material.