Robert Utterback | COMP 210: Object-Oriented Programming, Spr... https://robertutterback.github.io/courses/comp210/s18/

COMP 210: Object-Oriented Programming, Spring 2018

*This syllabus is subject to change based on specific class needs, especially the schedule. Significant deviations will be discussed in class.*

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Content   
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Monmouth College Services

Logistics

Class meetings:   
Class: MWF 1:00 PM - 1:50 PM in CSB 303   
Lab: W 2:00 PM - 3:50 PM in CSB 309

Instructor: Robert Utterback   
Office: CSB 342   
Phone: 309.457.2202   
Website: https://robertutterback.github.io   
Email: rutterback@monmouthcollege.edu   
Office hours: M 5-6 PM. Tu 1-2 PM. W 10-11 AM. Th 8-10 AM. F 8-9 AM. By appointment (see the schedule on my webpage).

Website: https://robertutterback.github.io/courses/comp210/s18/ Credits: 1 course credit   
Prerequisites: COMP 220.

Content

In this course, students will extend the Design Recipe ideas to explore the paradigm of Object-Oriented programming (OOP) using the Java programming language. As with all

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programming paradigms, OOP constitutes not just a set of tools for writing programs but a way of thinking and reasoning about the structure of programs and computations in general.

The Object-Oriented paradigm draws on all the computing and programming concepts students studied in the introductory sequence.

Topics and Objectives

In this course students will explore the Object-Oriented paradigm for programming. Just as the shift from Functional programming in Racket to Imperative programming in C++ required a change in perspective, so to will the shift to OOP in Java. Students will explore the conceptual foundations of OOP as well as modern OOP in Java.

Designing Object-Oriented Class Hierarchies   
Classes and Class Hierarchies   
Abstract Classes   
Generics

Basic UML-style Diagrams   
Developing GUI-Based Programs using Model-View-Controller (MVC) Basic OO Design Patterns

Sources

There is no course textbook. The standard Oracle-provided Java reference and tutorial material will be heavily utilized, including:

Oracle. *Java 8 API* 2014. https://docs.oracle.com/javase/8/docs/api/ Oracle. *The Java Tutorials*. 2016. https://docs.oracle.com/javase/tutorial/

We will also pull material from “How to Design Classes” by Felleisen et. al., available at http://www.ccs.neu.edu/home/matthias/HtDC/htdc.pdf. In addition, I will assign readings from a multitude of other internet sources. Links to these sources will be posted on this webpage as needed.

Programming Environment

All programs written in this course are required to compile and run on a Linux computer with Java 8 and the Eclipse IDE. You will probably be okay with the recently-released Java 9, but the department server has Java JRE/JDK 8 installed (along with Eclipse). This software can be accessed via a VNC desktop session. While development is not required in this   
environment, failure to properly port a program to the required environment could result in a program not compiling correctly when it is being graded. All software for this course is available free of charge from Oracle and the Eclipse Foundation.

*Oracle JAVA JDK/JRE*: Get the Java SE JDK. http://www.oracle.com/technetwork /java/javase/downloads/index.html   
*Linux OpenJDK*: This is an open-source version of the JDK. If you’re running Linux, this might be easier for your to install and shouldn’t cause you any problems.

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http://openjdk.java.net/install/index.html   
*Eclipse IDE*: Get either the Java Developers or Classic version. http://www.eclipse.org /downloads/

Policies

General expectations: In short, I expect you to be respectful of others and take responsibility for your own learning. You are here to learn, so work hard and be professional.

Just attending class is not sufficient to truly learn the material. Read the text, use the resources available at Monmouth College, and go beyond the material.

If you miss class, you are responsible for everything covered on that day. College is, in some sense, your job. Take pride in creating quality work. Staple your assignments, label problems, and present your answers neatly and orderly.

Your job is to convince me that you have learned the material – show your work! Even if you do not know a particular answer, guide me through your thought process.

Late assignments: In general, late assignments will *not* be accepted. Exceptions may be made only for situations beyond your control. If you feel your reason is justified, schedule a meeting with the instructor to plead your case.

Academic dishonesty: Monmouth College’s official policy on academic dishonesty can be found here. You are responsible for reading and complying with that policy.

*In this course, any violation of the academic honesty policy will have varying*   
*consequences depending on the severity of the infraction as judged by the instructor.*

*Minimally, a violation will result in an “F” or 0 points on the assignment in question.*

*Additionally, the student’s course grade may be lowered by one letter grade. In severe cases, the student will be assigned a course grade of “F” and dismissed from the class.*

*All cases of academic dishonesty will be reported to the Associate Dean who may decide to recommend further action to the Admissions and Academic Status Committee, including suspension or dismissal. It is assumed that students will educate themselves regarding what is considered to be academic dishonesty, so excuses or claims of ignorance will not mitigate the consequences of any violations*

Collaboration: We encourage you to make use of the resources available to you – it is fine to seek help from a friend, tutor, instructor, internet, etc. However, *copying of answers and any act worthy of the label of “cheating” is never permissible*! It is   
understandable that when you work with a partner or a group that the resultant product is often extremely similar. This is acceptable but be prepared to be asked to defend your collaborations to the instructor. *You should always be able to reproduce an answer on your own, and if you cannot you likely do not really know the material*.

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One way to collaborate effectively is to avoid taking careful notes during a collaboration session. Discuss the material and sketch out possible solutions on a whiteboard. When you have finished, take a break and then write up your solutions without any help from notes or pictures from the study session. This not only helps avoid violations of academic dishonesty, it also improves your retention of the material!

When assignments are meant to be done in groups, you will be directed to turn in one set of solutions per group. Otherwise, each student must turn in an assignment representing their own work.

Electronic devices: Do not use your phone in class. Keep it on silent or leave it at home. Any computer or tablet usage should be related to the course. Other usage is rude and distracting to others.

Assessment

Assignments

The course workload is as follows:

|  |  |
| --- | --- |
| **Category** | **Number Of Assignments** |
| Labs | 8–10 |
| Homework | 8–10 |
| Projects | 2 |
| Exams | 5–7 |

Homework assignments will always either precede a lab to prepare for it or follow a lab to complete it. There will be no dedicated midterm exam, but 7 exams spaced throughout the semester. Each exam will focus primarily, but not necessarily exclusively, on the material covered since the previous exam. The final exam will include a small number of cumulative questions, and I reserve the right to include at most one cumulative question on each of the other exams.

Workload

The weekly workload for this course will vary by student but on average should be about 13 hours per week. The follow tables provides a rough estimate of the distribution of this time over different course components for a 16 week semester.

|  |  |  |
| --- | --- | --- |
| **Category** | **Total Time** | **Time/Week (Hours)** |
| Lectures+Labs |  | 4 |

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| **Category** | **Time/Week (Hours)** |
| Homework | 48 | 3 |
| Exam Study | 16 | 1 |
| Projects | 48 | 3 |
| Reading+Unstructured Study |  | 2 |
|  | | |

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Grading

Lab and homework assignments are graded on a simple 3 point scale. Grades are marked with, in decreasing order, a check-plus, check, or check-minus. Your final grade for these two assignment categories is then based off the respective averages and determined by the following chart. Notice this chart lists the minimum average needed to achieve a particular letter grade.

|  |  |
| --- | --- |
| **Assignment Avg. (Min)** | **Letter Grade** |
| 2.8 | A |
| 2.75 | A- |
| 2.5 | B+ |
| 2.25 | B |
| 2 | B- |
| 1.75 | C+ |
| 1.5 | C |
| 1 | C- |
| 0.75 | D |
| 0.5 | F |

Your final grade is based on a weighted average of particular assignment categories. You can estimate your current grade based on your scores and these weights. You may always visit the instructor *outside of class* to discuss your current standing.

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|  | **Category** | **Weight** |  |
|  | Exams | 45% |  |
|  | Projects | 25% |  |
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| **Category** |
| Labs | 12.5% |  |
| Participation | 5% |  |

This courses uses a standard grading scale. Assignments and final grades will not be curved except in rare cases when its deemed necessary by the instructor. Percentage grades translate to letter grades as follows:

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| --- | --- |
| **Score** | **Grade** |
| 94–100 | A |
| 90–93 | A- |
| 88–89 | B+ |
| 82–87 | B |
| 80–81 | B- |
| 78–79 | C+ |
| 72–77 | C |
| 70–71 | C- |
| 68–69 | D+ |
| 62–67 | D |
| 60–61 | D- |
| 0–59 | F |

You are always welcome to challenge a grade that you feel is unfair or calculated incorrectly. Mistakes made in your favor will never be corrected to lower your grade. Mistakes made not in your favor will be corrected. *Basically, after the initial grading your score can only go up as the result of a challenge*.

Schedule

The following tentative calendar should give you a feel for how work is distributed throughout the semester. Assignments and events are listed in the week they are due or when they occur. *This calendar is subject to change based on the circumstances of the course*.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Date** | **Topic** | **Assignment** |  |
|  | Mon 01/15 | Programming Environment | Read this |  |
| 6 of 9 | Mon 05/07 8:00 | Final Exam |  | 8/14/18, 4:14 PM |
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| Robert Utterback | COMP 210: Object-Oriented Programming, Spr... | | | | | | | | https://robertutterback.github.io/courses/comp210/s18/  **Assignment** |
| **Date** | **Topic** | | | | | | |
| Wed 01/17 | | | | | | Procedural Java | | Lab 1 |
| Fri 01/19 | Basic Object-Oriented | | | | | | | Read Java OO Tutorial |
| Programming | | | | | | | |
| Mon 01/22 | Implementing Hierarchies, UML | | | | | | |  |
| Wed 01/24 | | | | | Comparing Objects | | | Lab 2, Read this and this |
| Fri 01/26 | Containment Relationships, Class | | | | | | | Read this |
| Extension | | | | | | | |
| Mon 01/29 | Access Modifiers, Overriding | | | | | | |  |
| Wed 01/31 | | Containment vs. Extension | | | | | | Lab 3 |
| Fri 02/02 | Lists, ADTs, and PDAs | | | | | | | Exam 1 out out |
| Mon 02/05 | Binary Trees | | | | | | |  |
| Wed 02/07 | | | | | | Static Factories | | Lab 4, Read this |
| Fri 02/09 | Huffman Codes | | | | | | |  |
| Mon 02/12 | Binary Search Trees | | | | | | |  |
| Wed 02/14 | | | | | | | BST Delete | Lab 5 |
| Fri 02/16 | Priority Queues | | | | | | | Exam 1 due |
| Mon 02/19 | Binary Heaps | | | | | | |  |
| Wed 02/21 | | | Implicit Trees; Generics | | | | | Lab 6, Read Java  Generics Tutorial |
| Fri 02/23 | Conc Lists | | | | | | | Watch this (slides) |
| Mon 02/26 | Conc List Discussion and Review | | | | | | |  |
| Wed 02/28 | | | | (Exam 2) | | | | Project 1 and lab out |
|  | | | | | | | | |

Fri 03/02

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|  | | | | |
|  | (03/05–03/09) | (Spring Break) | (Spring Break) |  |
|  | Mon 03/12 | JavaFX Basics, Property Binding | Read this |  |
|  | Wed 03/14 | Event-Driven Programming | Project 1 Free Lab |  |
|  | Fri 03/16 | Lambda Functions |  |  |
|  | Mon 03/19 | (Project 1 questions) |  |  |
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| Robert Utterback | COMP 210: Object-Oriented Programming, Spr... | | https://robertutterback.github.io/courses/comp210/s18/  **Assignment** |
| **Date** | **Topic** |
| Wed 03/21 | Tic Tac Toe Design | Project 1 due, Lab 7 |
| Fri 03/23 | Tic Tac Toe with MVC |  |
| Mon 03/26 | (Exam 3) | Exam 3 |
| Wed 03/28 | | Lab 8 |
| (03/30–04/02) | (Easter Break) | (Easter Break) |
| Wed 04/04 | Testing Controllers with Mock | Lab 9 |
| Objects | |
| Fri 04/06 | Test Harnesses; OO Design |  |
| Principles | |
| Mon 04/09 | Software Patterns |  |
| Wed 04/11 | Builder | Lab 10 |
| Fri 04/13 | Factory Method, Abstract Factory |  |
| Mon 04/16 | Prototype, Singleton |  |
| Wed 04/18 | Game of Life | Project 2 |
| Fri 04/20 | Structural Patterns, Adapter | Exam 4 |
| Mon 04/23 | Exam Review, Bridge |  |
| Wed 04/25 | Composite, Decorator |  |
| Fri 04/27 | Facade, Proxy, Comparison of | Exam 5 due (part of  project 2) |
| Structural Patterns | |
| Mon 04/30 | Behavioral Patterns: Observer, |  |
| Strategy, Visitor, Iterator | |
| Wed 05/02 | Criticism of OO, Review | Project 2 due, Practice Final, Solutions |
| Mon 05/07 8:00 | Final Exam |  |
| AM | |

Monmouth College Services

The Teaching and Learning Center offers FREE resources to assist Monmouth College students with their academic success. Programs include Supplemental Instruction for difficult classes, Drop-In and appointment tutoring, and individual Academic Coaching.

The TLC is here to help students excel academically. TLC services are not just for struggling students, but can assist all students to get better grades, practice stronger study skills, and manage time. The TLC is located on the 2nd floor of Poling Hall.

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Disability Support Services: If you have a disability or had academic accommodations in high school or another college, you may be eligible for academic accommodations at Monmouth College under the Americans with Disabilities Act (ADA). Monmouth College is committed to equal educational access. Students with disabilities can apply for accommodations at the Teaching and Learning Center.

If you have not been diagnosed with a learning disability but believe that you would benefit from disability screening, please contact Amy Hofmeister in Counseling Services.

The instructor will be notified of students with accommodations; however, it is the student’s responsibility to activate her/his accommodations. Please meet with the instructor ASAP if this applies to you!

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