Object-Oriented Software Design
ECE373

Jonathan Sprinkle

Day/Time: TR 8:00-9:15 am
Location: M Pacheco ILC 125

http://www.ece.arizona.edu/~ece373/

Instructor: Jonathan Sprinkle
ECE 456N
Email: sprinkle@ECE.Arizona.Edu

Office Hours: 11:00-12:00 noon, Tuesday
1:00-2:00 pm, Thursday
And by appointment.
Instructor may cancel office hours without advance email notice.

Textbook(s): Object-Oriented Modeling and Design with UML 2nd ed., M. Blaha, J. Rumbaugh
C++ Primer, Lippman (optional, as a language reference).

Prerequisites: ECE 175 or C SC 227, or written consent of instructor, prior to early withdrawal date.
Auditing requires written consent of instructor, prior to audit change date.

Course Description:
This is a design course, which will teach you the concepts of object-oriented software design, and will use programming exercises as proofs of concept. This is not primarily a programming course: this does not mean you will not program, but it does mean that you are expected to already know Java, C, or some other high-level language. If you do not know how to program in any language, see the instructor immediately after class to discuss any options.

The set of topics and areas covered by this course, and upon which you may be tested, include:

- Object-Oriented computing concepts
  - abstract data types, classes, methods, message passing, inheritance, polymorphism, dynamic binding
- Object-Oriented design and architectures
  - class hierarchies, state modeling, object models
- Introduction to the Unified Modeling Language
  - use case development, sequence models, activity models
- Object-Oriented programming languages and environments
Object-Oriented software implementation projects

In addition to these topics, students who successfully complete the course will engage in a project which is approved by the instructor, and which is performed by a team (not an individual).

Important Dates:

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 8/30</td>
<td>Last day to add classes for credit from zero units</td>
</tr>
<tr>
<td>F 8/17</td>
<td>Last day to drop courses resulting in deletion of course enrollment from record</td>
</tr>
<tr>
<td>F 10/15</td>
<td>Last day to drop a class with a grade of “W” (if passing) or to change to or from audit grading; the instructor’s signature on a Change of Schedule form is required</td>
</tr>
<tr>
<td>W 12/8</td>
<td>Last day of classes and laboratory sessions</td>
</tr>
<tr>
<td>R 12/16</td>
<td>8:00-10:00 am, Final Examination</td>
</tr>
</tbody>
</table>

Course Outline:

The listing of weekly course lecture topics may be found on the webpage, and is subject to change without notice due to class progress. In the event of class cancellation, advance notice via email will be given, but any homeworks due that day will still be due unless otherwise notified via email.

Grade Policy:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Grade Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework:</td>
<td>30%</td>
<td>[90 – 100]</td>
<td>A</td>
</tr>
<tr>
<td>Examinations:</td>
<td>30%</td>
<td>[80 – 90)</td>
<td>B</td>
</tr>
<tr>
<td>Project:</td>
<td>20%</td>
<td>[70 – 80)</td>
<td>C</td>
</tr>
<tr>
<td>Attendance/Participation/PoP Quizzes:</td>
<td>10%</td>
<td>[60 – 70)</td>
<td>D</td>
</tr>
<tr>
<td>Quizzes:</td>
<td>10%</td>
<td>[0 – 60)</td>
<td>E</td>
</tr>
</tbody>
</table>

Examination breakdown is 10% for the mid-term, and 20% for the final exam. Assignment of grades is done according to a “modified-contract” method. The above scale represents a minimum guarantee. However, the instructor reserves the right to “upward curve” the final grade of the entire class, or of one or more individuals whose objective performance improves as the term progresses.

Homework Companion

The homework must be submitted according to the guidelines set forth by the Homework Companion (available from the course webpage). Failure to abide by the Homework Companion may result in a failing grade on that homework, regardless of the correctness of the work.

Project Companion:

Students in the course will perform work on a course project which will be of significant value as deemed appropriate by the instructor. The course project will be submitted via the terms of the Project Companion, which will be distributed as described in the Schedule of Weeks.
Attendance, Participation, and Pop Quizzes:

Attendance is mandatory. Although the class roll may not be taken every day, pop quizzes may be given without notice. Pop quizzes may not be made up. If you are not in class during a day where an ad hoc group exercise occurs, it may reduce your participation grade by at least 10% for each such day missed.

Class Disruptions:

Please silence your cell phone, and do not use it during the class. The use of a phone in class will adversely affect your attendance grade.

Academic Integrity:

Students are expected to do all work by themselves, except when specified by the instructor in writing. This includes using source code from the internet, as well as code you may receive from students who have previously taken this course. If you refer to someone else’s solution(s) to a homework assignment while preparing a homework submission for this course, then you are cheating—even if the solution is from a previous offering of this course. Automatic grading takes advantage of the Measure of Software Similarity (MOSS) Project (see http://theory.stanford.edu/~aiken/moss/).

All exceptions to this policy will be plainly marked in the requirements for that exercise or project. Any violations of this policy will be dealt with to the full extent permitted by the University of Arizona, and may result in suspension or expulsion from the university, in addition to a failing grade. Please familiarize yourself with the Code of Academic Integrity if you have any questions (see http://deanofstudents.arizona.edu/codeofacademicintegrity).

Safety Instructions:

The frequent operation of a computer, such as will be required in this course, may have long-term disabling effects if you do not appropriately consider your ergonomic interaction with the computer, desk, chair, and light sources. Poorly designed work stations/practices can lead to musculoskeletal disorders, and may result in chronic pain, inability to sleep, or expensive surgery decades from today. The habits you form in your university years may well impact your future performance, and it is highly recommended that you consult the free, online, ergonomics information from the Office of Risk Management, available at http://risk.arizona.edu/healthandsafety/ergonomics.shtml

Students with Disabilities:

If you anticipate issues related to the format or requirements of this course, please meet with the instructor to discuss ways to ensure your full participation in the course. If you determine that formal, disability-related accommodations are necessary, it is very important that you be registered with the Disability Resource Center (621-3268; http://drc.arizona.edu) and afterward notify the instructor of your eligibility for reasonable accommodations. Only after that point can we plan how to best coordinate any accommodations.

ABET Classifications

Learning Outcomes

By the end of this course, the student will be able to:

1. Understand the fundamentals of OO programming vs. classical procedural programming;
2. Perform a design criticism;
3. Understand the connections between various UML diagrams for a consistent design; and
4. Develop engineering software for mechanical or electrical system simulation through object-oriented methods.
Program Outcomes

The following program outcomes are satisfied by this course:

(a) an ability to apply knowledge of mathematics, science, and engineering (MEDIUM)
(c) an ability to design a system, component, or process to meet desired needs (HIGH)
(d) an ability to function on multi-disciplinary teams (LOW)
(e) an ability to identify, formulate, and solve engineering problems (MEDIUM)
(g) an ability to communicate effectively (MEDIUM)
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (HIGH)