Course Syllabus

Please note that the specifics of this Course Syllabus are subject to change. Instructors will notify students of any changes and students will be responsible for abiding by them. Even if you print this syllabus, please check the online version often.

Description

IST 242: Intermediate & Object-Oriented Application Development (3 credits) - Intermediate application development including algorithms, data structures, and object-oriented concepts.

This is a second course in application development. It will focus on the intermediate knowledge needed to create applications that use high level programming languages, combining original code with existing code libraries and application programming interfaces (APIs). The perspective will be of application development that takes place within a human and organizational context; in this sense data structures will be construed as representations of organizational entities and information, and algorithms as a reflection of human and organizational processes and activity. Students will also learn about common application architectures and design patterns. This is a hands-on, practical course designed for IST design and development option undergraduate students and others as an elective.

Prerequisites

One of the following courses:

- IST 140
- CMPSC121
- IST 240

Objectives

Understand the basic rationale and approaches for object-oriented application development and how to apply this to the development of object-oriented applications.

- How classes and objects can be used to represent real world problem spaces, including the abstractions of methods, attributes, operations, encapsulation and information hiding and the separation of behavior and implementation
- How to implement object-oriented abstractions; core object-oriented concepts including inheritance, polymorphism, encapsulation, and information hiding; classes and their constructors, attributes, and methods; abstract classes, methods, and interfaces.
- Work with other resources in object-oriented application development, including external Application Program Interfaces (APIs), packages, and techniques for input and output using external files

Problem-solving in human-centered application contexts that require event-driven applications

- Understand and describe the role of event handling as a central application development technique for human-centered problem domains
- Implementing event-driven application development for systems supporting human-computer interaction
- Understanding the importance of defensive approaches to event-driven application design and development, including exception handling

Instructor

- Fred Fonseca, fuf1@psu.edu

All course-related email, including messages to your instructor(s) and fellow students should be sent within Canvas, using the Inbox. Every attempt will be made for the instructor (or a substitute) to respond to email questions within 24 hours.

Additional instructor information can be found by selecting People and then the Teacher name.

Materials

Most students do well in the course using only my notes and examples. Some students like to have a text book to support their learning.

Recommended textbook:
• Big Java: Late Objects 1st Edition by Cay S. Horstmann
• The PSU library has it online through Safari Books although with a limited number of licenses: Horstmann Big Java (http://proquestcombo.safaribooksonline.com/book/programming/java/9781118087886).

Alternatively:
• Students may still have access to their IST 140 textbook, "Programming in Java" by Zybooks.
• Java Tutorials (http://docs.oracle.com/javase/tutorial/)

I will be making reference to all of them in the readings.

Additionally, there is a short reading on UML. The book below is available for free at Safari Computer Books online through our Library (http://www.libraries.psu.edu/psul/databases.html#s-content):

Assignments & Grading

This course is assignment intensive. It is very important that you follow the deadlines and do your labs and assignments every week. No late assignments are accepted.

The course builds incrementally from your pre-requisite IST 140 (IST 297D) to a fairly developed knowledge of Java.

The sharing of knowledge is strongly encouraged. Working together to understand and learn during the semester is essential; however, COPYING (from the Web or peers) assignments or Java code is unacceptable. This will be considered cheating.

The course has labs, assignments, and a final project.

• Labs
  • Lighter programming assignments that introduce a new subject.
• Assignments
  • We will wrap up every major topic with a problem that will gather what was discussed that week. It should be done individually without any discussions among peers. Clarifying questions might be asked directly to the instructor.
  • Each problem is built around the three core pedagogical beliefs that guide this class.
    • First, the problem-based approach puts more control of the learning into the hands of the student.
    • Second, problem-based learning requires students to develop excellent problem-solving skills.
  • Thus, the course design is PROCESS oriented than CONTENT oriented. As a student, your responsibility is to develop a product and the instructor's role is to help guide, interpret, assess and evaluate your efforts. The instructor's role is to be a guide and facilitator. The central point is that the problem-based nature of the course provides you, the student, a chance to both pursue topics and draw on material and resources in ways that best help you respond to the problem that has been posed. In doing this, you can learn about how to assess your own knowledge and develop strategies for how to improve your problem-solving skills.

There are two types of deliverables. Most of labs and assignments will ask for Java code.

• Java: You will submit the .java files, the Java source code. They should be zipped using NetBeans export to zip function. Please check the submission guide.
• Other: PDFs, Word files, or just filling in submissions forms on the dropboxes.

Your grade is based on the total number of points you earn and you earn points with each assignment, lab, and final project.

The grading systems and scale are developed to encourage and reward learning. Early in the semester, the assignments are weighted less so that you can learn (typically by failing to get the full assignment) by doing problem-based work without being 'punished' for making mistakes. A well-developed final project will give you a good grade. You should see the labs and assignments as stepping stones to get to the final project.

<table>
<thead>
<tr>
<th>Grading Category</th>
<th>Total Points</th>
<th>Percentage of Final Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labs and Assignments</td>
<td>100</td>
<td>100%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

https://psu.instructure.com/courses/1819655/assignments/syllabus
### Course Grading Scale

The following are minimum cutoffs for each grade:

- 93.00% = A
- 90.00% = A-
- 87.00% = B+
- 83.00% = B
- 80.00% = B-
- 77.00% = C+
- 70.00% = C
- 60.00% = D
- less than 60.00% = F

### Course Policies and Expectations

- Logging into Canvas - Students are expected to login regularly to check for course updates, announcements, emails, discussions, etc.
- Emailing through Canvas - Students are expected to use Canvas for all course email communication.
- Attending virtual meetings - Students are expected to use specified virtual meeting tool(s) for collaboration, meetings, presentations, etc., as needed.

### Technical Requirements

Standard World Campus computer technical specifications are assumed for this course. Please test your computer (https://courses.worldcampus.psu.edu/public/diagnostics/general.shtml) for requirements. In addition, a webcam and a headset with a microphone are REQUIRED for the course. These may be used for virtual meetings, virtual office hours, interactions with classmates and your instructor, and team presentations - which are all conducted with virtual meeting tools. No special software is required.

### Resources

Find extensive information and links to many resources, including the Penn State library, web conferencing, course tools, writing help, and much more on the Resources (https://docs.google.com/document/d/1Zsu5Lgaic3kLLiM3co5mxWU5B7IOfu15sppAQvsym6E/pub) page.

### University Policies

Review current information regarding Penn State policies, including Academic Integrity, Disability Accommodations, Military Accommodations, and many others on the University Policies (https://docs.google.com/document/d/1FIqdl2qwJSJOigQWTWRByCXSbUny6DcZA0JHzL4yBk/pub) page.

### Schedule

The following schedule outlines the topics covered in this course, along with the associated time frames, readings, activities, and assignments. All due dates reflect Eastern Time (ET). Specifying the time zone ensures that all students have the same deadlines, regardless of where they live.

#### Assignments Summary:

<table>
<thead>
<tr>
<th>Date</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mon Jan 9, 2017</td>
<td><a href="https://psu.instructure.com/courses/1819655/assignments/8959703">L01 Lab: A Football Team</a> due by 8:30pm</td>
</tr>
<tr>
<td>Date</td>
<td>Details</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Sun Jan 15, 2017</td>
<td><img src="https://psu.instructure.com/courses/1819655/assignments/8959699" alt="L00: Academic Integrity Quiz" /> due by 5:59pm</td>
</tr>
<tr>
<td></td>
<td><img src="https://psu.instructure.com/courses/1819655/assignments/8959698" alt="L00: Using Canvas Quiz" /> due by 5:59pm</td>
</tr>
<tr>
<td></td>
<td><img src="https://psu.instructure.com/courses/1819655/assignments/8959701" alt="L01: Activities - Objects and Classes" /> due by 5:59pm</td>
</tr>
<tr>
<td>Mon Jan 23, 2017</td>
<td><img src="https://psu.instructure.com/courses/1819655/assignments/8959702" alt="L01 Assignment: Objects and Classes" /> due by 5:59pm</td>
</tr>
<tr>
<td>Sun Jan 29, 2017</td>
<td><img src="https://psu.instructure.com/courses/1819655/assignments/8959704" alt="L02: Activities - Inheritance and Interfaces" /> due by 5:59pm</td>
</tr>
<tr>
<td></td>
<td><img src="https://psu.instructure.com/courses/1819655/assignments/8959707" alt="L03A: Activities - Graphical User Interface" /> due by 5:59pm</td>
</tr>
<tr>
<td>Mon Jan 30, 2017</td>
<td><img src="https://psu.instructure.com/courses/1819655/assignments/8959706" alt="L02 Lab: Inheritance" /> due by 5:59pm</td>
</tr>
<tr>
<td>Mon Feb 6, 2017</td>
<td><img src="https://psu.instructure.com/courses/1819655/assignments/8959705" alt="L02 Assignment: Interfaces" /> due by 5:59pm</td>
</tr>
<tr>
<td>Mon Feb 13, 2017</td>
<td><img src="https://psu.instructure.com/courses/1819655/assignments/8959708" alt="L03A Assignment: Basic Window with a Layout" /> due by 5:59pm</td>
</tr>
<tr>
<td>Mon Feb 20, 2017</td>
<td><img src="https://psu.instructure.com/courses/1819655/assignments/8959709" alt="L03B Assignment: Action Listener and Communication between Classes" /> due by 5:59pm</td>
</tr>
<tr>
<td>Mon Mar 6, 2017</td>
<td><img src="https://psu.instructure.com/calendar?event_id=2704232&amp;include_contexts=course_1819655" alt="Spring Break Begins" /> 12am</td>
</tr>
<tr>
<td>Sun Mar 12, 2017</td>
<td><img src="https://psu.instructure.com/calendar?event_id=2704231&amp;include_contexts=course_1819655" alt="Spring Break Ends" /> 12am</td>
</tr>
<tr>
<td>Mon Mar 13, 2017</td>
<td><img src="https://psu.instructure.com/courses/1819655/assignments/8959710" alt="L03C Assignment: Paint" /> due by 5:59pm</td>
</tr>
<tr>
<td>Mon Mar 27, 2017</td>
<td><img src="https://psu.instructure.com/courses/1819655/assignments/8959711" alt="L03D Assignment: The Tackle-Breaking Running Back" /> due by 5:59pm</td>
</tr>
<tr>
<td>Mon Apr 3, 2017</td>
<td><img src="https://psu.instructure.com/courses/1819655/assignments/8959712" alt="L03E Assignment: Inner Listeners (Redo Listeners)" /> due by 5:59pm</td>
</tr>
<tr>
<td>Mon Apr 10, 2017</td>
<td><img src="https://psu.instructure.com/courses/1819655/assignments/9003070" alt="L03F Assignment: Lambda Expressions (Redo Listeners)" /> due by 5:59pm</td>
</tr>
<tr>
<td>Sun Apr 16, 2017</td>
<td><img src="https://psu.instructure.com/courses/1819655/assignments/8959713" alt="L04: Activities - Object Oriented Design" /> due by 5:59pm</td>
</tr>
<tr>
<td>Date</td>
<td>Details</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Mon Apr 24, 2017</td>
<td>L04 Assignment: MVC - Model, View, Controller</td>
</tr>
<tr>
<td></td>
<td>[<a href="https://psu.instructure.com/courses/1819655/assignments/8959714">https://psu.instructure.com/courses/1819655/assignments/8959714</a>]</td>
</tr>
<tr>
<td>Mon May 1, 2017</td>
<td>Optional - MVC Redo</td>
</tr>
<tr>
<td></td>
<td>[<a href="https://psu.instructure.com/courses/1819655/assignments/8959700">https://psu.instructure.com/courses/1819655/assignments/8959700</a>]</td>
</tr>
</tbody>
</table>