

The Pennsylvania State University
School of Information Sciences and Technology
IST 311 – Object-Oriented Design and Software Applications
Spring 2006

Section 001: T-R 1:00 – 2:15pm 208 IST Building

Instructor

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Teaching Assistant

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Course Web Site

<http://faculty.ist.psu.edu/haynes/ist311/>

Course Overview

This course will provide students with a background in object-oriented design and software development. Using modern design and programming languages (UML and Java) and with the support of CASE tools (Rational Rose and JBuilder Enterprise), students will gain an appreciation for the nature of object-oriented software design and for some of the issues that arise in the space between requirements analysis and design, and between design and implementation. The course will interleave design and programming activities and will incorporate active, collaborative and problem-based learning experiences to the greatest possible extent.

Course Objectives

At the conclusion of this course, students will be able to:

- Explain the foundations of the object-oriented software paradigm.
- Explain the central issues in software design and development.
- Use the Java programming language and some of its core class libraries.
- Use the full range of UML diagrams to represent different system design elements.
- Design and create a basic, windowed, event-driven application in Java.

Course Texts

Java in 60 Minutes A Day
Rich. F. Raposa
Wiley
ISBN: 0-471-42314-9

The Elements of UML Style
Scott W. Ambler
Cambridge University Press
ISBN: 0-521-525470

Object-Oriented Software Engineering: Using UML, Patterns and Java, Second Edition
Bernd Bruegge and Allen H. Dutoit
Prentice Hall; 2 edition (September 5, 2003)
ISBN: 0-130-471100

You are responsible for all the readings, even if the material is not covered explicitly in class. Please read over the assigned material prior to class and be prepared to discuss and ask questions about the covered topics. You should also review the material after class as not every topic will be covered during class time. Many passages in the text may need to be read several times to gain clarity. Taking notes on the material you are reading and reflecting on both the reading and these notes will help you to understand better the issues, concepts and techniques that are being presented.

Course Support

Course Web Site

<http://faculty.ist.psu.edu/haynes/ist311/>

This active course web site offers access to the updated syllabus, assignments, readings, links to resources, and other valuable material. We will post late-breaking information to the announcements area on the web site.

Course list-serv

Section 001 - L-IST311-1-sp06@lists.psu.edu

We will be using the IST 311 list-serv conferences to post course material, conduct on-line discussions, and share information. Please use your Penn State e-mail account for all class-related mail and when participating in the class list-serv conference. Plan on checking the conferences regularly.

See also the Resources pages on the course web site for links to other potentially helpful material.

Assessment

The following weights are assigned to the different assessed components of the course:

Individual activities and assignments:

Quizzes	25%
Homework	20%
In-class activities	10%
Participation	<u>10%</u>
	65%

Group activities and assignments:

Mid-term Project	10%
Final Project	<u>25%</u>
	35%

Assessment is based on 100 possible points with letter grades being assigned as follows:

A	93-100
A-	89-92
B+	86-88
B	83-85
B-	79-82
C+	76-78
C	70-75
D	60-69
F	0-59

The course will follow an active, problem-based approach to learning. There are no exams; quizzes, homework assignments and longer-term group projects will provide the opportunity to gain practice with new concepts and skills, and develop and demonstrate a solid understanding of the course material.

Quizzes:

About six (6) quizzes will be given over the course of the semester to encourage your ongoing attention to course material. Covered topics will be drawn largely from assigned readings, but all other lecture content and supplementary readings are also fair game.

Homework:

Homework is assigned and reviewed regularly. The purpose of many homework assignments is to encourage you to explore material *before* it is discussed in class. Homework assignments are marked with an emphasis on effort and completeness. Many homework assignments are for paired work but note that this will be specified for each assignment, assume that you are to complete assignments on your own, individually, unless explicit in the assignment.

Participation:

Participation is a critical component of the course. In order to receive full participation credit, you must demonstrate active and meaningful involvement in class activities. This will require that you attend meetings regularly, and be prepared.

Course Projects

Course Project

The main course project will consist of design and development of a substantial object-oriented software application. You will work on the project exercises in groups of four or five. The instructor will assign group membership during the first few weeks of class. The purpose of this project is to give you hands-on, in-depth experience with a wide range of object-oriented design and development activities. The course project domain will be decided early in the semester based on your project nominations.

Group Project Performance & Grading

The mid-term and final group project deliverables as well as any deliverables collected and marked between these major project milestones will be assigned a single grade. However, your individual grade for the group project components will reflect the results of *three* group peer evaluations that will be performed over the course of the semester. At the end of the semester you will also produce a one page *personal contribution essay* detailing your involvement in the production of project deliverables. In extreme cases, students that do not contribute to the group project will be asked to do the work on their own or with other non-contributors.

UNIVERSITY POLICIES

Academic Integrity:

Academic integrity is a basic guiding principle for all academic activity at Penn State University, allowing the pursuit of scholarly activity in an open, honest, and responsible manner. In accordance with the University's Code of Conduct, you must not engage in or tolerate academic dishonesty. This includes, but is not limited to cheating, plagiarism, fabrication of information or citations, facilitating acts of academic dishonesty by others, unauthorized possession of examinations, submitting work of another person, or work previously used without informing the instructor, or tampering with the academic work of other students.

Any violation of academic integrity will be investigated, and where warranted, punitive action will be taken. For every incident when a penalty of any kind is assessed, a report must be filed. This form is used for both undergraduate and graduate courses. This report must be signed by both the instructor and the student, and then submitted to the senior associate dean, Joe Lambert.

Affirmative Action & Sexual Harassment:

The Pennsylvania State University is committed to a policy that all persons shall have equal access to programs, facilities, admission, and employment without regard to personal characteristics not related to ability, performance, or qualifications as determined by University policy or by Commonwealth or Federal authorities. Penn State does not discriminate against any person because of age, ancestry, color, disability or handicap, national origin, race, religious creed, gender, sexual orientation, or veteran status. Direct all inquiries to the Affirmative Action Office, 211 Willard Building.

Americans with Disabilities Act:

IST welcomes persons with disabilities to all of its classes, programs, and events. If you need accommodations, or have questions about access to buildings where IST activities are held, please contact us in advance of your participation or visit. If you need assistance during a class, program, or event, please contact the member of our staff or faculty in charge.

An Invitation to Students with Learning Disabilities:

It is Penn State's policy to not discriminate against qualified students with documented disabilities in its educational programs. If you have a disability-related need for modifications in your testing or learning situation, your instructor should be notified during the first week of classes so that your needs can be accommodated. You will be asked to present documentation from the Office of Disability Services (located in 116 Boucke Building, 863-1807) that describes the nature of your disability and the recommended remedy. You may refer to the Nondiscrimination Policy in the *Student Guide to University Policies and Rules*.

CONDUCT

Classes will start **on time** and end as scheduled.

You should attend each class and *actively participate* in the class activities and discussions.

Attendance will not be taken, however, quizzes and in-class problems will be given regularly and may not always be announced prior to the class. There are no make-ups but your single lowest quiz and in-class activity score, one of each, will be dropped. If you need to miss a class for some legitimate reason, you **MUST** let the instructor know **BEFORE** the class begins.

Students who participate in University-sanctioned events (such as athletics) must make prior arrangements and give ample notice.

The **computers** in the classroom are for course-related activities **ONLY**. Unless you are working on a course activity that explicitly requires that you use the computers, they should be closed. Surfing the web, e-mail, and on-line chat are some of the activities that are generally considered **NOT** related to the course. If spurious in-class computer use becomes a problem, I reserve the right to implement changes to the syllabus and grading schema to induce compliance.

Class participation is my way of assessing your intellectual engagement with the topics we are covering. You demonstrate this engagement in a number of ways including speaking up in class, bringing interesting and relevant material (such as copies of articles or URLs) in to the class, contributing to on-line discussions with peers via the class listserv, working with the TAs, and visiting me during office hours to discuss the material being covered. Conversely, missing classes, being late to class, disruptive in-class behavior, sleeping in class, or spurious use of the computers in class will result in loss of participation credit.

For every hour of class time, be prepared to budget about 3-4 hours of out-of-class time. This estimate is a guide; the time which you actually need will vary by topic and assignment. For example, if the material is new to you or difficult to comprehend, it will require more of your time.

All work must be completed and turned in at the start of class on the assigned date.

Assignments submitted late will be assessed a 25% penalty for each 24 hour period between the due date and when the assignment is finally submitted. Computer problems and mistakes such as failing to include an attachment with an electronic submission will result in a late penalty.

All assignments should be computer-printed, double-spaced, on 8.5"x 11" paper. All pages should have 1" margins. Papers should be stapled and collated. Please do not use report covers.

Please take care to proofread your work. Writing mistakes will impact your grade, especially if they reflect carelessness on your part. Mistakes include spelling, grammatical errors, and typos. I will not read any work past the 5th mistake. You may find a good resource in the **Writing Center** (219 Boucke, 863-3240).

Please check that your work is properly referenced and adheres to standards of both academic integrity and proper form. The APA style (see <http://www.apa.org>) is generally accepted in our field.

I expect individual work to be just that - done by you, alone. I expect group work to be just that – a product of the collaborative efforts of all group members.

COURSE SCHEDULE

This is a **tentative** schedule and is **subject to change** during the semester.

Other assignments and readings due on a specific day may be posted on the course web page. Check the course web site daily for schedule updates.

#	Date	Title/Topic	Assigned Reading Due Other Assignment Due
1	T: 1/10	Course Overview & Project Use Cases	
2	R: 1/12	Software Engineering Basics	Bruegge & Dutoit Ch. 1
3	T: 1/17	Introduction to UML	Bruegge & Dutoit Ch. 2
4	R: 1/19	Java Fundamentals & Control Structures	Raposa Chs. 1, 2, 3
5	T: 1/24	Classes & Objects	Raposa Ch. 4
6	R: 1/26	Methods	Raposa Ch. 5
7	T: 1/31	Inheritance	Raposa Ch. 6
8	R: 2/2	Encapsulation	Raposa Ch. 7
9	T: 2/7	Requirements Elicitation & Analysis	Bruegge & Dutoit Ch. 4
10	R: 2/9	Polymorphism & Abstraction	Raposa Ch. 8
11	T: 2/14	Modeling Structure Class Diagrams	Bruegge & Dutoit Ch. 5 (Part 1)
12	R: 2/16	Project work	
13	T: 2/21	Modeling Interaction Sequence Diagrams	Bruegge & Dutoit Ch. 5 (Part 2)
14	R: 2/23	Java Collections	Raposa Ch. 9
15	T: 2/28	Project Work	
16	R: 3/2	Project Work	
-	3/6 - 3/10	** Spring Break, No Classes **	
17	T: 3/14	Decomposition	Bruegge & Dutoit Ch. 6 Project Mid-Term
18	R: 3/16	Java Interfaces	Raposa Ch. 10
19	T: 3/21	Architecture	Bruegge & Dutoit Ch. 7
20	R: 3/23	Exception Handling	Raposa Ch. 11
21	T: 3/28	Modeling Activities	Review Bruegge Ch. 2 (activity diagrams) Read Ambler Ch. 9 (activity diagrams)
22	R: 3/30	Java GUI Programming	Raposa Ch. 12
23	T: 4/4	Persistent data	
24	R: 4/6	Event Handling	Raposa Ch. 13
25	T: 4/11	Modeling States	
26	R: 4/13		
27	T: 4/18	Design Patterns	Bruegge & Dutoit Ch. 8
28	R: 4/20	Course Project Coaching	
29	T: 4/25	Course Project Coaching	
30	R: 4/27	Course Project Coaching	
-	M: 5/1	Final Projects Due	