SIE 277 Fall 2025 Object-Oriented Modeling and Design

Course Description

Modeling and design of complex systems using the Unified Modeling Language (UML). Most effort will be in the problem domain (defining the problem). Some effort will be in the solution domain (designing and/or producing hardware or software), but fully implementing hardware and software are not required for this course.

Course Prerequisites or Co-requisites

ECE 175 or CSC 127A.

Instructor and Contact Information

Office Hours Zoom Meeting: M-W-F 2:30 PM to 3:00 PM
Office Hours (online) : Book your slots via D2L -
UA Tools ->. zoom -> Appointments -> Schedules
Office Hours (In-person): M-W-F 3:00 PM to 4:30 PM
Office Hours (In-person) Location: B552 - Main Library

Please note:
Zoom sessions for online consulting need to be self-scheduled via zoom widget on D2L. You are encouraged to meet during these times about anything on your mind. However, if these times do not work with your schedule, other meeting times are available by appointment; please send the request via email.
For In-person meetings, the office location at main library can change on some days as booking may not be available for the same room. Please check this document or watch course notifications on Brightspace regularly for any changes in the office hours information.

Contact Policy:
Email: Your email should include the following **Subject Line: SIE 277 001 010 Student [Question / Request / Notification]**. Whether you choose Question, Request, or Notification depends on what you need. Then just ask your question, or make your request, or provide the notification in the text of the email.
Turn Around Time:
Instructor will try to respond as soon as possible, but please allow 24 hours depending on their commitments.

Course Objectives and Expected Learning Outcomes

By the end of this course, students should be able to do the following:

1. Develop models of systems that may contain software and non-software components
2. Represent these models using the Unified Modeling Language (UML)
3. Design a system:

a) Derive requirements statements and use cases based on a set of business requirements

b) Derive the UML Analysis Model (the problem domain) by refining and analyzing the requirements statements and use cases

c) Derive the UML Design Model (the solution domain) by refining and analyzing the Analysis Model

d) Derive planning-level documentation and diagrams for the UML Implementation Model (how the system will be implemented) and Operational Model (the running system) *.

** We only plan for the Implementation and Operational Models because creating software and hardware components are not required for this course. You may wish to create prototypes for your Semester Project, but that is entirely optional and up to you.*

Assessments and Weighted Distribution

Assessment	Weight	Learning Outcome	Description
Course Participation (including attendance)	10%	All	• Course Participation activities are designed to provide practice, evoke, questions, and help self-assess progress and understanding. • Course Participation measures class engagement including participating by asking and answering questions through discussion boards, reflections, and other interactive assignments, helping others, and submitting low-stake, ungraded topic application lesson activities which are based on real-world problems as practice. • Course participation also measures participation in surveys that might be launched during the semester for feedback and improving the learning experience.
Quizzes	10%	All	• Quizzes are delivered through the course Quiz Tool and may or may not be timed assessments. Quizzes help inform the student and instructor on progress and / or gaps in learning.
Midterm Exam 1	20%	1, 2, 3a	• Comprehensive. • Exams are delivered through the course Quiz Tool and will include one or more case study to provide an overview of the problem to the solved.
Midterm Exam 2	20%	1, 2, 3a, 3b	• Comprehensive. • Exams are delivered through the course Quiz Tool and will include one or more case study to provide an overview of the problem to the solved.
Final Exam	20%	All	• Comprehensive. • Exams are delivered through the course Quiz Tool and will include one or more case study to provide an overview of the problem to the solved.
Semester Project (including Micro Labs)	20%	All	• Comprehensive. • The semester project will begin with a larger case study that gives an overview of the system to be modelled and described. • Focused Micro Labs will be submitted intermittently throughout the semester, typically after each learning module. • The student will create a solution that includes deriving requirements, analysis of the requirements to create use cases, an analysis, design, implementation, and deployment model of the system described in the case study.

Assessments and Distribution

Semester grades use Regular Grades:

A 90% - 100%
B 80% - 89%
C 70% - 79%
D 60% - 69%
E 0% - 59%

Required Textbook

This textbook is required and reading assignments will begin immediately in this course. Arlow, J., and Ila Neustadt, UML 2 and the Unified Process: Practical Object-Oriented Analysis and Design, Second Edition, Addison-Wesley (Pearson Education, Inc.), 2005.

The University Bookstore has made this book available and has provided a link for you in our D2L Course Site. The Bookstore maintains and administers this link and associated FAQs.

If you wish to purchase this book on your own, here are the details of our required textbook:

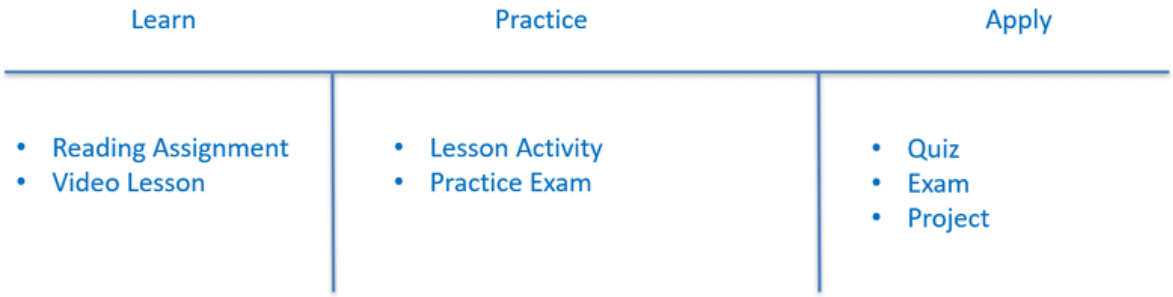
Title	Publisher UML 2 and the Unified Process: Practical Object-Oriented Analysis and Design
Authors	Jim Arlow and Ila Neustadt
ISBN	9780132702638
Year	2005
Edition	2nd Edition
Publisher	Addison-Wesley Professional

Course Format and Teaching Methods

This course will include a required textbook, lessons, videos, activities and discussion, projects, UML software (access is provided free by the University), internet resources, and intermittent assessment. The lesson activities are designed to provide practice, evoke questions, and help you assess your progress and understanding by applying recent course learning to real-world example problems as practice.

Please make sure you visit the course site frequently to stay up to date. Any notices, changes, or corrections will be posted in the Announcements section of the course (Course Home) on D2L. All course information and materials will be posted on the D2L Course Site.

A quick overview of our course's learning structure is illustrated below:



Most lesson videos are short; lasting 5 to 10 minutes. Lesson activities are opportunities for active learning that reinforces important material, concepts, and skills. The activities I have designed for this course are experiential; based on real-world work that I have performed as an engineer and assigned to engineering teams not as a learning experience, but as part of our work. This representative work allows you to apply what you have learned, and what you are actively learning, to promote a personal bond between you and that work. I've also found that, personally, I don't know what questions I have until I try something firsthand.

Equipment and Software Requirements

For this course you will need daily access to a laptop or web-enabled device with webcam and microphone; regular access to a reliable internet signal; and the ability to download and run the following software: web browser, Adobe Acrobat, etc.

We will also use **Enterprise Architect** which will be provided to you for **free** by the University. Students are required to use Enterprise Architect on certain assignments including the semester project. Any work requiring Enterprise Architect will be clearly called out.

Reference Material (Optional, but helpful)

- McGuire, Saundra Yancy, and McGuire, Stephanie, Teach Yourself How to Learn : Strategies You Can Use to Ace Any Course at Any Level, First Edition, Stylus Publishing, LLC., 2018.
    - From our Library: https://bit.ly/3g1xcol
- Craig C. Larman, Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development, Third Edition, Pearson Education, Inc., 2005.
- Rumbaugh, J., Jacobson, I. and Booch, G., The Unified Modeling Language User Guide, Second Edition, Addison-Wesley Professional, 2005.
- Rumbaugh, J., Jacobson, I. and Booch, G., The Unified Modeling Language Reference Manual, Second Edition, Addison-Wesley Professional, 2004.

- Fowler, M. and Scott K., UML Distilled: A Brief Guide to The Standard Object Modeling Language, Third Edition, Addison-Wesley, 2003.
- Jacobson, I., Booch G. and Rumbaugh, J., The Unified Software Development Process, Addison-Wesley, 1999.
- Cockburn, A., Writing Effective Use Cases, Addison-Wesley, 2001.
- Official UML website: http://www.uml.org/

Project Due Date and Examination Dates and Times

Semester Project Deadline: Thursday, 12/04/2025 before 08:00 AM

Final Examination:* Wednesday, 12/17/2025 from 10:30 AM -12:30 PM

** In-Person courses only. This date / time is set by the Office of the Registrar & states that the policy "As Confirmed by the Faculty Senate: No deviation from the exam schedule, once it is published, is authorized."*

Official Final Exam Schedule University of Arizona Registrar

Late Work Policy

With the exception of the Semester Project and Exams, late work is usually accepted only with prior agreement via email. Always contact the instructor as soon as possible, if you feel you will not be able to meet a deadline.

Course Teaching / Learning Assets

All course assets, including but not limited to videos, slides, activities, projects, and exams, belong to the University of Arizona. Students may not modify content or re-use content for any purpose other than personal educational reasons. All assets are subject to government and university regulations. Therefore, students accessing unauthorized assets or using them in a manner inconsistent with University of Arizona values and educational policies are subject to suspension or civil action.

Class Meeting Recordings

For class meeting recordings, which are used at the discretion of the instructor, students must access the content in D2L only. Students may not modify content or re-use content for any purpose other than personal educational reasons. All recordings are subject to government and university regulations. Therefore, students accessing unauthorized recordings, personally recording a meeting, or using them in a manner inconsistent with University of Arizona values and educational policies are subject to suspension or civil action.

Use of Generative AI

In this course, generative artificial intelligence/large-language-models tools, such as ChatGPT, Claude, Copilot, Gemini/Bard, Dall-e, Bing, may be used for non-graded learning and research activities with appropriate acknowledgment and citation, but never for any activity that will be graded like Quizzes, Weekly

Reflections, Homework, Exams, Micro-labs or Semester projects. When used for research, information gathering or as a learning tool, be conscious of the learning outcomes from this course. Steer clear of prompts that bypass analytical reasoning and diminish opportunities for critical thinking and problem-solving.

Students are responsible for investigating and deciding the accuracy, credibility, and source of any information they gain from these tools. In the context of semester project or any other group work, every student is responsible to make ensure that no group work is submitted that uses Generative AI resources without proper acknowledgement or citations. Please use the following guidelines for acknowledging/citing Generative AI: How to cite ChatGPT

Use of these tools for Homework, Exams, Quizzes, Weekly Reflections, Micro-labs or Projects is considered a violation of the Code of Academic Integrity and subject to the most severe sanctions listed in the section below about Code of Academic Integrity. If you are in doubt as to whether you are using Generative AI tools appropriately in this course, you are encouraged to discuss your situation with the instructor. Be aware that many AI companies collect information. Do not enter confidential information as part of a prompt. LLMs may make up or hallucinate information. These tools may reflect misconceptions and biases of the data on which they were trained and the human-written prompts used to steer them. You are responsible for checking facts, finding reliable sources for, and making a careful, critical examination of any work that you submit.

Code of Academic Integrity

- Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work / exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See: http://deanofstudents.arizona.edu/codeofacademicintegrity and http://deanofstudents.arizona.edu/academic integrity/students/academic-integrity
- The University Libraries have some excellent tips for avoiding plagiarism, available at http://new.library.arizona.edu/research/citing/plagiarism.
- Re-distributing class notes and / or other course materials in any way is not permitted without the instructor's express written consent. This includes student notes or summaries that substantially reflect lectures or other materials. These resources are made available only for personal use by students.
- Violations to this and other course rules are subject to the Code of Academic Integrity and may result in course sanctions and may also constitute copyright infringement. Course sanctions include notation of the violation(s) on the

student's transcript, a failing grade in the course, or revocation of a student's degree, suspension or expulsion from the program, department, college, or University.

Safety on Campus and in the Classroom

For a list of emergency procedures for all types of incidents, please visit the website of the Critical Incident Response Team (CIRT) at https://cirt.arizona.edu/case-emergency/overview. Also watch the video available at https://arizona.sabacloud.com/Saba/Web_spf/NA7P1PRD161/common/learningeventdetail/crtfy0 00000000003560

University Policies

The university policies on absence and class participation, threatening behavior, accessibility and accommodations, academic integrity, and non-discrimination and anti-harassment may be found at https://academicaffairs.arizona.edu/syllabus-policies

Subject to Change Statement

Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.