COMP 3700.001 Software Modeling and Design
Syllabus

Term: Fall 2021.
Schedule: TTh 11:00–12:15 PM

Office Hours and Zoom Virtual Offices
Instructor: Dr. Shehenaz Shaik (shaik@auburn.edu)
Zoom Virtual Office: https://auburn.zoom.us/j/3451884101
Office Hours: Tue and Thu 1–2 PM, plus, by appointment.

Teaching Assistant #1:
Tam Nguyen (ttn0006@auburn.edu)
Office Hour: 3-3:30 PM M-F
Zoom Virtual Office: Refer canvas

Teaching Assistant #2:
Raisul Arefin Nahid (ran0013@auburn.edu)
Office Hour: Mon(10-10:30AM); Tue(12:30-1PM); Wed(11-11:30AM); Thu(12:30-1PM); Fri(10-10:30AM)
Zoom Virtual Office: Refer canvas

Required Text
- Object-Oriented Modeling and Design with UML, 2nd edition, Michael Blaha and James Rumbaugh, Prentice Hall, 2005. ISBN: 978-0130159205.

Optional Texts
- Design Patterns: Elements of Reusable Object-Oriented Software, 1st edition, Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides, Grady Booch (Foreword), Addison-Wesley Professional, 1995. ISBN: 978-0201633610
- Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development, 3rd edition, Craig Larman, Prentice Hall, 2005. ISBN: 978-0131489066
- Software Engineering 10th Edition, by Ian Sommerville, Publisher: Pearson; ISBN: 978-0133943030

Catalog Description
Current processes, methods, and tools related to modeling and designing software systems. Communication, teamwork, and a design experience are integral course experiences.

Course Objectives
Student will be able to:
- Understand the role of analysis and design in the software engineering lifecycle.
- Develop object-oriented designs by applying established design principles.
- Develop use-case and scenario descriptions of the requirements.
- Develop richer descriptions of design models using UML diagrams.
- Understand the role and influence of design patterns and frameworks in software design.
- Evaluate the quality of design models.

Topics Covered

- Introduction to software analysis and design (3 hours)
- Object-oriented analysis with use-case modeling (3 hours)
- Conceptual domain modeling (2 hours)
- Architectural styles and design (3 hours)
- Responsibility-driven object interaction design (3 hours)
- Class design diagrams, association, aggregation, inheritance (1.5 hours)
- Dynamic behavior modeling with UML state & activity diagrams. (3 hours)
- Component-based software design with UML component and deployment graphs (3 hours)
- OO frameworks and software design patterns (9 hours)
- Design quality evaluation using OO design metrics (3 hours)
- Exams (5 hours)
- Group project presentations (5 hours)

This course typically requires at least 9 hours of time per week on average for the average student. If you don't have 9 hours per week for COMP 3700, please drop the class.

Prerequisite:
COMP 2710 Software Construction

Assessment
Exams: 3

- There will be two midterms and a final exam.
- Questions will be derived from lectures, material taught only in classes, and from assignments. The question format will be mixed. Additional details will be provided on canvas.

Homework Assignments: 4

- These activities will be take-home in nature and designed to reinforce concepts taught in class. An electronic copy must be submitted through the Canvas system.
- I reserve the right to assess other penalties for any errors not strictly covered in the rubric. I also reserve the right to give bonus points for exceptional work.

Quizzes: Approx. 1 per topic

- Quizzes will be open book, and open notes.

Grades:

- 2 Midterm exams - 30%
- Final exam - 20%
- 4 Homeworks – 20%
- Project – 20%
- Worksheets / Quizzes - 10%

Letter grade policy: Standard 10-point scale

Course Policies

Makeup Policy for the Exams: There will be no make-up exams except through arrangement with Dr.Shaik **24 hours prior to** the exams. There is no guarantee that your request will be granted.

Extended Student Absence: If illness causes you to be unable to participate in the course, please contact me as soon as possible to discuss your options.

Extended Instructor Absence: If illness causes me to be unable to continue teaching the course, a back-up instructor has been selected who will assume all teaching responsibilities to ensure that the course will proceed uninterrupted.

Auburn University Transition to Remote Operations: In the event that the University is forced to move to remote operations and fully online instruction, you should personally plan now for this contingency to ensure that you will be able to minimize the disruption this move could cause to your personal living and study arrangements.

Scaling, Curves, etc.: Grades may be (not guaranteed) scaled, curved, or adjusted arbitrarily. Some opportunities for bonus points may be provided to the entire class.

Homework/Project Due Dates: Projects will be submitted through Canvas. Projects will always be due at 11:59 PM on the due date. Deadlines will be made as generous as possible to *a priori* considering illness, other courses, Acts of God, and other conceivable excuses. If you have a documented illness preventing you from completing your assignment, you may submit all of your partial work and request an extension. **This extension is not automatic**.

Late Submission Penalty
Late submissions are not accepted without valid excuse.

Rebuttal Period: You will be given a period of 72 hours to read and respond to the comments and grades of your homework or project assignment. The TA may use this opportunity to address any concern and question you have. The TA also may ask for additional information from you regarding your homework or project.

Announcements: You are responsible for all announcements made in class or electronically. You should read your Canvas information at least once every two days.

Special Accommodations: A student in need of special accommodations must bring that need to my attention within the first two weeks of class. The need must be properly documented.

Academic Integrity: Students will be expected to understand and follow Academic Honesty policies in place by the university. Homeworks are to be completed individually. Students may discuss with their friends about general approaches to solving problems and writing programs. Students should NOT share any solutions, models, etc. with the other COMP 3700 students. Your models, and programming code are exclusive to you and your group. Please do not attempt to recycle design models or code from the Internet (plagiarism). Any instance of suspected cheating or plagiarism will be referred to student judicial affairs.

Approved references:
The following constitute acceptable references to help you to complete assignments.

- The course textbooks are always approved and content may be used without citation.
- My course notes, lectures, and advice I give may be used without citation
- Other books/textbooks on the language are fine, but require citations

- You are allowed to discuss broad conceptual ideas, but never to share solutions. If you discuss something with another student (even casually), you should always cite that reference in clear terms.

Unapproved references (these constitute Academic Dishonesty):
This is not a complete listing and cases of ambiguity should always be referred to the instructor for approval prior to use.

- Solution manuals for the text (or the like)
- Websites that sell custom code / problem solutions to individuals
- Solutions / Code written by others (students or otherwise) for this class or similar classes
- Anything not listed under "Approved References" or approved by the instructor

You MUST document references clearly. If you discuss a problem / project with another student or professor, you should indicate what you discussed and who you discussed it with clearly in the submission documentation (and/or code).
For example:
// FName LName
//Project2
//ABC helped me debug a syntax error in my 'for' loop.
//I used Wikipedia.org in order to learn how a genetic algorithm works.
//I spoke with PQR in the class about identifying objects.
If you don't need any sources for an assignment, clearly state "I did not use any external sources for this assignment" in your submission. Failing to document sources is plagiarism and will be penalized. If you are unsure whether or not to document a source, it is better to document. Breaches of Academic Honesty will be referred to the Academic Honesty Committee and the strictest sanctions possible (including expulsion and failure) will be my recommendation. **If you are ever unclear about whether or not a course of action is unacceptable, you are always encouraged to consult the instructor.**

Attendance: You are responsible for all material and announcements presented in class (even if absent).

- For exams:
  - if you have a planned university-approved absence you must make me aware before the test in writing (with appropriate documentation).
  - if you have an unplanned absence, you must provide written, documented, and verifiable justification.
  - Make-up exams will be different from the original exam.
- If you are late for a test, you do not receive any extension.
- Consistent attendance over Zoom is typically essential to obtaining a good grade (C or better) in COMP 3700.

Getting Help: Homework/Project assignments are challenging and time-consuming. You are always welcome to bring questions concerning labs to the office hours. A good strategy is to always start early on projects, so that if you run into difficulties, you can get help as soon as possible. I will do my best to respond to questions within 48 hours of receiving them.

Office Hours: You are always welcome to visit Dr. Shaik during office hours over Zoom to discuss projects or general concepts. The Zoom virtual office is https://auburn.zoom.us/j/3451884101 To get urgent help or advice out of office hours, it is recommended to send an email in advance to make an appointment.

Course Difficulty: The course starts off relatively easy and gets harder as time goes on. Often, students are deceived by the (slower) initial pace and develop lazy habits at the beginning of the course. By mid-semester, they have thrown away many grade opportunities and find themselves in a bad situation with respect to grades. No amount of effort at the end of the class will compensate for consistent, dedicated effort throughout the class. Whether or not you have past experience with programming, my strongest recommendation is that you respect the class and come to class ready to engage every single class period. If you do this, you will dramatically increase your chances of success.

Study Hints

- Ask questions in class.
- At the first sign of difficulty, talk to your instructor and the teaching assistant.
- Form a study group and meet regularly.
- Construct chapter summaries noting concepts, definitions, & procedures.