Instructor: Patti Iles Aymond
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paymond@lsu.edu (**by far the best way to reach me**)
Phone: (225) 578-4359

Section 1 Class: TTh 10:30 – 11:50 AM; 1200 PFT
Section 2 Class: 3PM – 4:20 PM; Location 215 Tureaud
Fully In-person

Drop-in Office Hours:
Tuesday & Thursday 12:30 PM – 2:30 PM
and by Appointment

Teaching Assistant(s): TBD

Course Description

Advanced object-oriented software development with an emphasis on the use of the unified modeling language as a design tool. Prerequisite: CSC 1254 or CSC 1351.

Course Objectives

- Describe, compare and contrast common principles for OO analysis and quality design
- Describe the characteristics of quality software systems
- Describe the relative advantages and disadvantages among several major process models
- Apply fundamental principles of Object Oriented (OO) programming
- Formulate models of a design plan by utilizing the Unified Modeling Language (UML)
- Classify common patterns in OO design
- Create a solution using an appropriately selected design pattern
- Apply communication skills necessary to work in a collaborative environment on a team-based project
- Apply skills in technical writing
- Apply communication skills necessary to participate in an oral presentation and project demonstration

Course Layout

- **Course Lectures:** The class will be FULLY IN-PERSON. Lecture attendance is required. Once the group project has started, attendance will be taken on a regular basis and will count as a homework grade.
- **Homework Assignments:** Homework assignments will be made available in Moodle. These are to be completed and uploaded to Moodle, as instructed. All UML assignments must be implemented using Enterprise Architect, unless otherwise specified.
- **Class Project:** Students will work together in a collaborative environment to tackle a complex problem within the problem domain posed by the instructor. Students are expected to work together, divvy up responsibilities, and share resources in the implementation of the project. Every student is expected to do their fair share of work on the project. A student's project grade will be proportionally adjusted based on level of effort expended on the project. A student cannot successfully complete this course without substantive contribution to the team project.
- **Exams:** There will be one, 1 hour and 20 minute, midterm exam and a two hour final exam. Arrangements for a make-up test must be made *prior* to the test. The instructor will be following LSU policy PS-22 with regards to valid reasons for missing an exam.

Evaluation

Grading will be based on in-class quizzes, homework assignments, class attendance, the class project, and two exams:

10%	Homework & Class Attendance	25%	Midterm Exam
40%	Class Project	25%	Final Exam

Final grade will be determined by overall average as follows:

Score	Grade	Score	Grade	Score	Grade
90-92.99	A-	93-96.99	A	97-100	A+
80-82.99	B-	83-86.9	B	87-89.99	B+
70-72.99	C-	73-76.99	C	77-79.99	C+
60-62.99	D-	63-66.99	D	67-69.99	D+
0-59.99	F				

Textbooks

Course Text:
- Object-Oriented Design & Patterns, Second Edition by Cay Horstman, Wiley.
  - This book is out-of-print, but the author has provided a watermarked PDF version for use in this class.

Course Topics

Course topics are expected to include, but are not limited to:
- Building quality software systems
- Introduction to OO development processes: test-driven development, pair programming, agile development
- User stories and system specification
- Refactoring and design improvement
- Universal Modelling Language (UML) for software architecture and state
- Design Patterns: their intent, applicability, benefits, and drawbacks, structure, and implementation
- Advanced object-oriented programming for implementation of certain patterns (interfaces, inner classes, virtual functions, private and multiple inheritance)
- Inter-personal dynamics that occur within a small project team

Class Policies

- Class Attendance: Students are required to attend class. Class time will be frequently used as project time; if students are not in class, their team will be adversely affected by their absence. Class attendance will be taken often and will count as a homework assignment grade. **Attendance WILL be taken on project kickoff and project presentation days.**
- Moodle: The course Moodle will be the official avenue for communication between the instructor, teaching assistants, and students. Moodle will be used for providing general course information, making announcements, making assignments, turning in assignments, and posting grades. Check it often for new or updated information. If you don't see something in Moodle that you think should be there, report it to the instructor as soon as possible.
- Communication: All electronic communication between students and the instructor and teaching assistants should maintain a professional decorum (e.g., address the recipient properly and use whole words, complete sentences, and proper grammar). Be sure to include enough detail of the problem so that you form a well-thought out question. The more detail you can give as to your problem, the more likely the instructor or teaching assistant will be able to help you.
- Distractions: Please silence your phones and put them away at the beginning of every class. If you receive an urgent call or text during class, please take the device into the hall to complete your call/text. If you must enter class late or leave early, please do so as quietly as possible. Please avoid activities that will distract your classmates (e.g., talking, rustling papers, moving around), etc. The instructor reserves the right to expel a student from the lecture room for distracting, disruptive, or disrespectful behavior.

- Preparation for class: It is important that you come to class prepared. That includes completing the reading assignment in advance and bringing pencil(s) and paper for in-class practice problems.
- Grading Change requests: All grades are uploaded to the course Moodle. Concerns about grades must be addressed **within one week** after the graded work is made available. Thereafter, all grade book entries are final. Grade change requests must be submitted to the instructor, via email, and must include the following:
    - Name of student
    - Date of the assignment/project/exam
    - Date of submission
    - Course number
    - List of the items that need to be corrected along with a concise reason as to why the grade change is needed.
    - Original assignment/test/quiz (not a copy).

  Grade change request decisions are at the discretion of the instructor and will be returned as the instructor has time to complete the regrade. Final exam and final grade change requests can be submitted up to two weeks after the final exam. After that time, grade change requests will be denied.
- Due Dates: **All work intended for grading must be submitted on time**. Any work not submitted before the cut-off period is not graded. Programming projects, including those encoded in EA, will be zipped and submitted on the course Moodle. Homework assignments will be taken on or uploaded to Moodle. **Moodle is unforgiving, so do not wait until the last minute to upload your assignment.**
- Missed Assignment/Exams: A grade of 0 is awarded for missed assignment/exam in the absence of a valid excuse, as determined by LSU policy. In the unusual circumstance that you must miss an assignment or exam due to medical reasons or other unforeseen emergency, you need to notify the instructor as soon as possible and provide sufficient documentation to verify the claim. The instructor will be following LSU policy PS-22 with regards to valid reasons for missing an exam. If the instructor deems that the excuse is valid and sufficiently documented, the instructor will determine how the missed work will be made up, depending on the circumstance.
- Special Accommodation: Students who have a disability that require accommodation(s) should make an appointment with the Office of Disability Services (Phone (225) 578-5919 or TDD: (225) 579-2600) to discuss their specific needs and present a letter from the ODS informing the instructor of their needs. All such matters, by University regulations, are strictly confidential.
- Collaborative Work: All homework assignments must be the independent work of the student. Students are not allowed to use another student's work, in part or in total, as their own work. Students are allowed to search for and use online and published sources of approaches, algorithms, and code. All approaches, algorithms, and code obtained from an outside source must be clearly marked in all turned in work or it will be considered plagiarism and academic dishonesty.
- Exam Dates:
    - Midterm Exam: Tuesday, March 7, during class
    - Section 1 Final Exam: Thursday, May 11 10AM-Noon Central Time
    - Section 2 Final Exam: Thursday, May 11 7:30AM – 9:30AM Central Time
- Important Dates:
    - Wednesday, January 25 – Final day to drop without a W (4:30 PM deadline)
    - Thursday, April 6 – Final day for dropping classes (4:30 PM deadline)
    - Thursday, April 6 – Final day to request rescheduling a final examination when three examinations are scheduled in 24 hours

Class Project

- On project kickoff day, the instructor will provide a project framework that project teams must adhere to. Teams are responsible for choosing the domain and application for their project.
- The class will be partitioned into teams of 6. Students may propose teams, but the instructor reserves the right to shuffle teams to ensure teams of size ~6.

- While teams are expected to equitably divvy responsibilities among team members, all team members are required to implement system and/or software designs in Enterprise Architect, all team members are required to implement some portion of the functionality, and all team members are required to participate in the in-class final project presentation.
- The team must select a leader that will take on the responsibility of coordinating the team efforts.
  - The team leader is expected to shoulder leadership responsibilities in addition to project responsibilities.
  - If the team leader provides good project leadership, they will get extra project points for their leadership efforts.
  - If the team leader fails to effectively lead the team, the team leader can lose project points.
  - The team may choose to change leadership for different Milestones, upon instructor approval.
- Feedback and recommendations for improvement on a milestone are expected to be addressed in the subsequent milestone.
- Project grades are calculated as follows:

$$\sum_i (Weight_i \times Grade_i \times PercentContribution_i \times NumTeamMembers \times L_i)$$

  - Where $i \in$ {*Proposal, Milestone 1, Milestone 2, Presentation, Postmortem*}
    - *Weight$_{Milestone\ 1}$* = 0.05
    - *Weight$_{Milestone\ 2}$* = 0.20
    - *Weight$_{Milestone\ 3}$* = 0.60
    - *Weight $_{Presentation}$* = 0.10
    - *Weight$_{Postmortem}$* = 0.05
  - *Grade$_i$* is the grade awarded to the team project for Milestone *i*
  - *PercentContribution$_i$* is the percentage that an individual team member contributed to the milestone. It is expected that every team member will contribute approximately the same amount to each milestone, but this factor corrects for the situation when contribution is not equitable within a team. This factor is determined by a survey of team members.
  - *L$_i$* is the leadership offset for Milestone *i* (either 1.05, 1.0, or 0.95)

- <u>Project Dates</u>:
  - Project Kickoff: Tuesday, January 31
  - **Project Milestone #1** (5%): Project Proposal, due 11PM Tuesday, February 7
  - **Project Milestone #2** (20%): System Architecture, due 11PM Thursday, February 23
    - In-class architecture review, Tuesday February 28 and Thursday March 2
  - Core Features should be implemented by Monday March 27
  - **Project Milestone #3** (60%): System Implementation, due 11PM Monday, April 10
  - **Project Presentation** during class (10%): due 11PM Monday 4/17. In class presentations on Tuesday 4/18, Thursday 4/20, Tuesday 4/25, and Thursday 4/27.
  - **Postmortem** (5%): due 11PM Wednesday, May 3; Discussion during class Thursday, 5/4

Communication Across the Curriculum (CxC)

This is a certified Communication-Intensive (C-I) course which meets all of the requirements set forth by LSU's Communication across the Curriculum program, including

- instruction and assignments emphasizing informal and formal technology communication;
- teaching of discipline-specific communication techniques;
- use of feedback loops for learning;
- 40% of the course grade rooted in communication-based work; and
- practice of ethical and professional work standards.

Students interested in pursuing the *LSU Communicator Certificate* and/or the *LSU Distinguished Communicator Medal* may use this C-I course for credit. And don't forget to check out the *CxC Studio resources* for additional support with all your communication projects in this class and beyond! For more information, visit *www.cxc.lsu.edu*.

LSU Student Code of Conduct

The LSU student code of conduct explains student rights, excused absences, and what is expected of student behavior. Students are expected to understand this code as described on the Code of Conduct page. Any violations of the LSU student code will be duly reported to the Dean of Students.

Academic Integrity

All assignments will be monitored against academic dishonesty. Examples of academic dishonesty include, but are not limited to:
- Accessing the solution manual to the text and copying the solution before attempting the problem on your own, while attempting the problem on your own, or after checking your work and finding your solution to be incorrect.
- Copying a problem solution from a classmate (be it one problem or the entire problem set). The copy may be identical or a rearranged version of another student.
- Giving your completed problem set to another student who has not yet completed their problem set.
- Copying a solution from another student verbatim.
- Peeking at a problem solution without the knowledge of the spied upon student.

All students, regardless of level of guilt, will be reviewed by SAA (Student Advocacy and Accountability) in the event that an academic misconduct violation is detected.
- This is particularly important for those of you who "share" your homework with others. Many times this is done with the best of intentions to help a classmate, but the classmate may copy your solution and present the work as their own. The "sharer", in the eyes of the university, is just as guilty as the copier.
- **Keep your work safe**. Never leave your homework with other students or send your solution to other students.

If there is evidence of academic misconduct on homework assignments, programming projects, quizzes or exams, all involved parties will be submitted to SAA for review.