LEWIS UNIVERSITY
A Catholic and Lasallian University

Object-Oriented Programming - 24500

Syllabus

Spring Semester 2019

I. Instructor Information

Instructor's name: Eric Pogue

Lewis office location: SU-116

Office hours: TTh 1-2pm CST by appointment

Appointments: Appointments can be requested via email

Lewis phone number: NA

Lewis email address: epogue@lewisu.edu

II. Course Information

Course: Object-Oriented Programming (CPSC-24500-001)

Course Credit Hours: 3

Course description:

Students will learn to design and develop software using the object-oriented approach. Topics include encapsulation, inheritance, polymorphism, abstraction, and patterns. Students will learn how to use an SDK to develop desktop and web applications that provide data processing and visualization services. Students will also learn how to manage threads and networking connections in software they write.

Prerequisites: CPSC 21000

Course meeting times: TTh 2-3:15pm CST from January 14 through May 3, 2019

Meeting location: AS 104A

Course final: Tuesday, May 7 from 1:30-3:30pm CST in our normal classroom (AS 104A)

Student Learning Outcomes:

1. solve problems by writing programs using standard language elements such as data declarations, arithmetic operations, conditional statements, loops, and functions
2. list and explain the key concepts of object-oriented development including encapsulation, inheritance, and polymorphism.
3. describe problems that typically plague software: rigidity, fragility, immobility
4. define the following object-oriented patterns: Factory, Singleton, Delegation, and Model-View-Controller
5. define and provide examples for object-oriented design principles: Liskov Substitution Principle, Dependency Inversion Principle, Interface Segregation Principle, Open-Close Principle, Single-Responsibility Principle
6. write class definitions and create objects from them

7. declare and use special types of functions for classes, including constructors, accessors, and mutators, and properties
8. create hierarchies of classes that start with abstract base classes and add functionality in descendant classes.
9. design an object-oriented program in UML (Unified Modeling Language) that is organized around a set of classes whose objects interact
10. describe what exceptions are and write programs that deal with them
11. perform screen-scraping by retrieving data from a website.
12. write programs that use various collections
13. use generic data types in programs
14. work with collections of objects from related classes polymorphically
15. explain the difference between classes and interfaces
16. define interfaces that specify behaviors that certain objects must have
17. perform input and output with text file streams
18. perform input and output with xml file streams and serialization
19. use an API as a reference when writing programs
20. build attractive, intuitive graphical user interfaces
21. write programs that use a graphical interface and manage user events using event-handling
22. describe and use the client-server computing model
23. define serialization
24. compare the advantages and disadvantages of various serialization sources and destinations
25. write a program that stores and retrieves data with a relational database
26. describe how Java achieves cross-platform compatibility
27. distinguish among heavyweight and lightweight components
28. define *callback function* as it relates to event handling
29. respond to user events in Java and/or Python
30. describe how layout managers arrange components
31. write unit tests to verify the correctness of software modules
32. manage programming projects using git

Program student learning outcomes:

1. develop programs using languages having different programming paradigms and for a variety of platforms
2. select the most appropriate data structures and algorithms for the given problem
7. explain how programming languages are designed and implemented

Baccalaureate Characteristics:

1. Essential Skills
6. Critical Thinking

III. University Mission Statement

Lewis University, guided by its Catholic and Lasallian heritage, provides to a diverse student population programs for a liberal and professional education grounded in the interaction of knowledge and fidelity in the search for truth.

Lewis promotes the development of the complete person through the pursuit of wisdom and justice. Fundamental to its Mission is a spirit of association, which fosters community in all teaching, learning and service.

How this course connects to the University Mission:

This course will allow us to extend our knowledge in software development, provide us the foundation for lifelong learning in this domain, and provide us the opportunity to assist each other on our learning journey.

IV. Course Materials

Textbook(s):

There are no required text books required for this course. An optional Java development book that you may find helpful is “Fundamentals of Object-Oriented Programming in Java” by Permanand Mohan.

Supplemental readings, videos, online materials: Links and references to additional readings, videos, and online materials will also be provided.

Hardware and software requirements: This course requires access to multiple software tools. There are generally available for free but will need to be installed and utilized from a Windows or Macintosh computer.

Other required materials or costs: During this course we will be setting up and utilizing GitHub and Microsoft Azure accounts. We will be able to complete course assignments utilizing these resources for free or very low cost (less than $20). You will need a credit card to sign up for the accounts.

V. Instructional Methods and Activities

Modality of Instruction: This course will be a face-to-face class with blended online elements.

VI. Course Schedule

Each two-week period will include one or more labs, a quiz, a programming project, and a discussion board topic. All assignments are due Sunday evening (11:59pm) at the end of each two-week period.

Weeks	Topics	Assignments
1&2	Object-oriented programming Concepts, Patterns, and Principles, and using Git client	Quiz 1, Project 1, and Discussion Board 1
3&4	Programming environments, Introduction to Java, and Introduction to JSON	Quiz 2, Project 2, and Discussion Board 2
5&6	How to be a successful programmer, Graphical User Interfaces, and GitHub	Quiz 3, Project 3, and Discussion Board 3
7&8	Using files with Java, JavaDoc, and Scanner command-line programming	Quiz 4, Project 4, and Discussion Board 4
9&10	Microsoft Azure, intermediate Java programming, and distributed programming	Quiz 5, Project 5, and Discussion Board 5
11&12	Object-oriented programming languages and platforms, threads, and more JSON	Quiz 6, Project 6, and Discussion Board 6
13&14	Final project proposals, Java graphical (GUI) programming, and model-view-controller	Quiz 7, Project 7, and Discussion Board 7
15&16	Advanced topics in object-oriented programming, and final projects	Final Project

Schedule Changes: *Material changes to the course schedule will be communicated through course lecture and/or Blackboard announcements.*

VII. Grading Criteria and Course Policies

Assignments and Course Requirements:

Assignments for this course will take the form of Programming Projects, Quizzes, Discussion Board topics, a class Demonstration, and a Final Project.

Course Grade: The course grade will be made up of Programming Projects, Quizzes, and Discussion Boards, one graded class demonstration, and a Final Project. The specifics are provided below.

Assignment	#	Pts	Total Pts	% of Grade
Programming	7	32	224	52%
Quiz	8	16	128	30%
Discussion Board	7	3	21	5%
Demo	1	9	9	2%
Final Project	1	48	48	11%
		Totals:	430	100%

Grading Policies: Late assignments will not be excepted except under extreme circumstances. It is vastly preferable to turn in a partially complete assignment than to turn in a late one.

Similarly, it is vastly more beneficially to turn in an assignment that has 70% of the features fully implemented than to turn in an assignment that has 100% of the features partially implemented.

Final course letter grade will be determined using the following approximate scale:

A	>= 93		
A-	90-92.99	C-	70-72.99
B+	87-89.99	D+	67-69.99
B	83-86.99	D	63-66.99
B-	80-82.99	D-	60-62.99
C+	77-79.99	F	< 60
C	73-76.99		

Course Policies: Class attendance is required unless otherwise specified. During our class time we will remain focused on the topics at hand, avoid utilizing phones or email, and be inclusive of our fellow classmates.

Changes to Course Assignments or Grades: *Changes to the course assignments or grades will be communicated through course lecture and/or Blackboard announcements.*

VIII. Information for Students

Requests for Reasonable Accommodations

Lewis University is committed to providing equal access and opportunity for participation in all programs, services and activities. If you are a student with a disability who would like to request a reasonable accommodation, please speak with the Learning Access

Coordinator at the Center for Academic Success and Enrichment (CASE). Please make an appointment by calling 815-836-5593 or emailing learningaccess@lewisu.edu. Since accommodations require early planning and are not provided retroactively, it is recommended that you make your request prior to or during the first week of class. It is not necessary to disclose the nature of your disability to your instructor. For more information about academic support services, visit the website at: www.lewisu.edu/CASE.

Lewis University has adopted Blackboard Ally providing alternative formats for files uploaded by instructors. Students can click the down arrow next to any file, and select Alternative Formats.

Sanctified Zone

Guided by its Catholic and Lasallian heritage, Lewis University is firmly committed to fostering a campus atmosphere that is permeated by its Mission values of Fidelity, Wisdom, Knowledge, Justice, and Association. Accordingly, we have declared the University campus to be a Sanctified Zone, a place and a people *United in Diversity.* The active promotion of diversity and the opposition to all forms of prejudice and bias are a powerful and healing expression of our desire to be Signs of Faith (Signum Fidei) to each other. To learn more about the Sanctified Zone, please visit: http://www.lewisu.edu/sanctified zone

Academic Integrity

Scholastic integrity lies at the heart of Lewis University. Plagiarism, collusion and other forms of cheating or scholastic dishonesty are incompatible with the principles of the University. Students engaging in such activities are subject to loss of credit and expulsion from the University. Cases involving academic dishonesty are initially considered and determined at the instructor level. If the student is not satisfied with the instructor's explanation, the student may appeal at the department/program level. Appeal of the department /program decision must be made to the Dean of the college/school. The Dean reviews the appeal and makes the final decision in all cases except those in which suspension or expulsion is recommended, and in these cases the Provost makes the final decision.

University Student Complaint Policy

The University Student Complaint Policy can be found at lewisu.edu/studentcomplaints

University Grade Appeal Policy

The University Grade Appeal Policy can be found at lewisuedu/studentcomplaints

Center for Health & Counseling Services

To support student success, all Lewis students are eligible for free health and mental health services on the Romeoville campus. This includes commuters and those living on campus, part-time and full-time students, graduate and undergraduate students, and those taking Lewis classes at other locations. For more information, visit the Center for Health & Counseling website at www.lewisu.edu/studentservices/health or call (815)836-5455.