The University of Texas at El Paso
Course Syllabus

COURSE DESCRIPTION

Dept., Number	CS 3331	**Course Title**	Advanced Object-Oriented Programming
Approval Date	October 2022	**Course Coordinator**	Yoonsik Cheon

CATALOG DESCRIPTION

Advanced Object-Oriented Programming (3-0) An in-depth exposure to the object-oriented programming paradigm, which builds upon programming experience gained in lower-level computer science classes. Emphasis on programming in an object-oriented language with which students are already familiar, and on requirements, testing, code reading, and comprehension.

TEXTBOOK

- *Object-Oriented Analysis, Design and Implementation: An Integrated Approach*. Brahma Dathan, Sarnath Ramnath. Springer, Universities Press, 2015.
- Martina Sedl, et al., UML@Classroom: An Introduction to Object-Oriented Modeling,Springer, 2015.

COURSE OUTCOMES

Learning Outcomes

Level 1 outcomes are those in which the student has been exposed to the terms and concepts at a basic level and can supply basic definitions. Upon successful completion of this course, students will be able to:

a) Explain the differences between an object-oriented approach and a procedural approach.
b) Describe the difference between waterfall and agile software development.

Level 2 outcomes are those in which the student can apply the material in familiar situations, e.g., can work a problem of familiar structure with minor changes in the details. Upon successful completion of this course, students will be able to:

a) Formulate use-case diagrams and scenarios to support understanding of user requirements.
b) Use object-oriented design notations, including UML class diagrams and state machine diagrams (optionally sequence diagrams) to model problem solutions.
c) Use basic object-oriented design patterns to structure solutions to software design problems.
d) Translate design features, such as classes and relationships, to implementations.
e) Use frameworks and library classes and methods, such as collections, GUI, multithreading, and networking, in problem solutions.

Level 3 outcomes are those in which the student can apply the material in new situations. This is the highest level of mastery. Upon successful completion of this course, students will be able to:

a) Design and implement software employing the principles of modularity, encapsulation, information hiding, abstraction, and polymorphism.
b) Design, implement, and use classes and objects by following coding conventions, guidelines, styles, and standards.
c) Design, implement exception handling (including user defined exceptions) and high order functions.
d) Evaluate existing classes and software for the purposes of extension through inheritance.
e) Create API documents for classes, fields and methods.
f) Design and implement test suites for automated unit testing.
g) Re-factor existing source code to improve its design or efficiency.

ABET STUDENT OUTCOMES MAPPING

Course Outcomes	Student Outcome
None	1
2a-c	2 (ABET 1)
2d-f, 3a-g	3 (ABET 2)
None	4 (ABET 5)
None	5 (ABET 4)
2a-b, 3e	6 (ABET 3)
None	7
None	8
2a-c, 2e, 3a-c, 3f	9
2a-e, 3a-g	10 (ABET 6)

PREREQUISITES BY TOPIC

CS 2302 with a grade of C or better