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|  | **East West University**  **Department of Computer Science and Engineering**  **Course Outline**  **Summer 2023 Semester** |  |

**Course: CSE110 Object Oriented Programming (Sections: 3 and 4)**

**Credits and Teaching Scheme**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Theory | Laboratory | Total |
| Credits | 3 | 1.5 | 4.5 |
| Contact Hours | 3 Hours/Week for 13 Weeks + Final Exam in the 14th Week | 3 Hours/Week for 13 Weeks | 6 Hours/Week for 13 Weeks + Final Exam in the 14th Week |

**Prerequisite**

CSE106 Discrete Mathematics

**Instructor Information**

**Instructor**: Tanni Mittra

Senior Lecturer, Department of Computer Science and Engineering

**Office**: Room: 636

**Tel. No.**: 09666775577 (hunting) ext. 448

**E-mail**: tanni@ewubd.edu

**GTA/UTA:** TBA

**Class Routine and Office Hour**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Day | 10:10-11:40 | 11:50-1:20 | 1:30-3:00 | 3:10-4:40 |
| Sunday | CSE110 (3)  Room: AB3-201 | Office  Hour | CSE207 (8)  Room: AB3- 302 |  |
| Monday | CSE110 LAB (4)  Room: 637 | | CSE110 (4)  Room: FUB-301 | Office  Hour |
| Tuesday | CSE207 LAB(8)  Room: 534 | Office  Hour | CSE207 (8)  Room: AB3- 302 | Office  Hour |
| Wednesday | CSE110 LAB (3)  Room : 616 | | CSE110 (4)  Room: FUB-301 | Office  Hour |
| Thursday | CSE110 (3)  Room: 107 | Office  Hour |  |  |

**Course Objective**

This course presents a conceptual and practical introduction to object-oriented programming (OOP). The course will cover general principles of programming in object-oriented frameworks to enhance transferable skills, such as programming, designing, and problem-solving skills. This course introduces object-oriented concepts and develops OOP programs which provide solutions to real-world object-oriented problems. Java is primarily chosen as the programming language in this course. Knowledge of this course will be needed as prerequisite knowledge for CSE207 Data Structures.

**Knowledge Profile**

K2: Conceptually-based mathematics, numerical analysis, statistics, and formal aspects of computer and information science

**Learning Domains**

Cognitive – C2: Understanding, C3: Applying

Psychomotor – P2: Manipulation, P3: Precision

Affective – A2: Responding

**Program Outcomes (Pos)**

PO1: Engineering Knowledge

**Complex Engineering Problem Solution**

None

**Complex Engineering Activities**

None

**Course Outcomes (Cos) with Mappings**

After completion of this course students will be able to:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CO** | **CO Description** | **PO** | **Learning Domains** | **Knowledge Profile** | **Complex Engineering Problem Solving/ Engineering Activities** |
| CO1 | **Understand** and **apply** the basics of object-oriented programming of the target languagefor writing object-oriented programs. | PO1 | C2, C3 | K2 |  |
| CO2 | **Understand and apply** the principles of OOP for implementing object-oriented solutions of simple use cases. | PO1 | C2, C3 | K2 |  |
| CO3 | **Apply** advanced OOP constructs, file and thread management for implementing object-oriented applications. | PO1 | C3 | K2 |  |
| CO4 | **Use** appropriate language constructs to design OO-based solution of a moderately complex problem; **Perform** and **demonstrate** the acquired skills; and **write** reports to develop programs for solving OOP-related problems. | PO1 | C3  P2, P3  A2 | K2 |  |

**Course Topics, Teaching-Learning Method, and Assessment Scheme**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Course Topic** | **Teaching-Learning Method** | **CO** | **Mark of Cognitive Learning Levels** | | **CO Mark** | **Exam**  **(Mark)** |
| C2 | C3 |
| Principles of Object-Oriented Programming and Basics of Elementary Programming in target language (conditional branching, looping, methods and arrays) | Lecture, Class Discussion, Discussion outside class with Instructor/TA | CO1 | 5 | 5 | 10 | **Midterm Exam I**  **(15)** |
| Introduction to Classes and Objects (Classes, Objects, Instance variables and instance methods, Constructors) | Do | CO1 | 5 |  | 5 |
| Inheritance and Polymorphism in OOP (super class, sub class, multiple-level inheritance, late binding) | Do | CO2 | 5 | 5 | 10 | **Midterm Exam II (17)** |
|
| Abstract Class and Interfaces (differences, applicability and implementation) | Do | CO2 | 7 |  | 7 |
|
| Exception Handling in OOP and  File handling using Text and Binary I/O | Do | CO3 |  | 10 | 10 | **Final Exam**  **(20)** |
| Implementation of Generics and GUI, Multi-threaded Programming, JDBC and other advanced topics | Do | CO3 |  | 10 | 10 |

**Laboratory Experiments and Assessment Scheme**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Experiment** | **Teaching-Learning Method** | **CO** | **Marks of Cognitive Level** | **Mark of Psychomotor Level** | | **Mark of Affective Level** | **CO Mark** |
| C3 | P2 | P3 | A2 |  |
| Java Basics of Elementary Programming, Conditional Statements | Lab Experiment and Result Analysis and Discussion with Instructor, Post-Lab Report | CO4 |  |  |  |  |  |
| Looping, Nested Looping, Arrays | Do | CO4 |  |  |  |  |  |
| Java Methods and library functions | Do | CO4 |  |  |  |  |  |
| Designing and Implementing simple Classes and Objects, Arrays of Objects etc. | Do | CO4 |  |  |  |  |  |
| Implementing associations of Classes | Do | CO4 |  |  |  |  |  |
| Designing and Implementing Inheritance and Polymorphism | Do | CO4 |  |  |  |  |  |
| Designing and Implementing Abstract Class and Interfaces | Do | CO4 |  |  |  |  |  |
| Understanding and Implementing Exceptions and File management | Do | CO4 |  |  |  |  |  |
| Lab Exercises  (Total) |  | CO4 | 12 | 2 | 2 | 1 | 17 |
| Viva | Individual Exam | CO4 | 4 | 0 | 0 | 1 | 5 |
| **Total** |  |  | **16** | **2** | **2** | **2** | **22** |

**Mini Projects**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Mini Project** | **Teaching-Learning Method** | **CO** | **Mark of Cognitive Learning Level** | **Mark of Psychomotor Learning Levels** | | **Mark of Affective Learning Level** | **CO Mark** |
| **C3** | **P2** | **P3** | **A2** |
| Lab-based Mini Project including Report and Presentation | Group-based moderately complex digital circuit design project with report writing and oral/poster presentation | CO4 | **8** | **1** | **1** | **1** | **11** |

**Overall Assessment Scheme**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Assessment Area** | **CO** | | | | **Other** | **PO Marks** |
| **CO1** | **CO2** | **CO3** | **CO4** |  | **PO1** |
| Class Participation and Performance |  |  |  |  | 5 | 5 |
| Class Test/Quiz |  |  |  |  | 10 | 10 |
| Midterm-I Exam | 15 | 0 | 0 | 0 |  | 15 |
| Midterm-II Exam | 0 | 17 | 0 | 0 |  | 17 |
| Final Exam | 0 | 0 | 15 | 0 |  | 20 |
| Laboratory Performance and Lab VIVA | 0 | 0 | 0 | 22 |  | 22 |
| Mini Project | 0 | 0 | 0 | 11 |  | 11 |
| **Total** | **15** | **15** | **15** | **33** | **15** | **100** |

**Teaching Materials/Equipment**

**Text Book:**

**Y. Daniel Liang, *Introduction to Java Programming, Comprehensive Version*, 10th edition, Pearson (2015)**

**Reference Book:**

* Walter Savitch, *Absolute Java*, Pearson (5th edition)
* Bert Bates and Kathy Sierra, *Head First Java*, O’Reilly Media (2nd edition)
* Paul Deitel and Harvey Deitel, *Java How to Program,* Prentice Hall (9th edition)
* Herbert Schildt, *Java: The Complete Reference*, 10th edition, McGraw-Hill Education (2017)

**Software/Tools:**

* Java Development Kit (JDK 1.8) <https://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html>
* Any Integrated Development Environment (IDE) supporting Java preferably Eclipse

<https://www.eclipse.org/downloads/>,

* NetBeans

**Exam Dates**

|  |  |  |  |
| --- | --- | --- | --- |
| **Section** | **Term I** | **Term II** | **Final** |
| 3 | 13 July 2023 | 10 August 2023 | 14 September 2023 |
| 4 | 12 July 2023 | 09 August 2023 | 13 September 2023 |

**Grading System**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Marks (%)** | **Letter Grade** | **Grade Point** | **Marks (%)** | **Letter Grade** | **Grade Point** |
| 97-100 | A+ | 4.00 | 73-76 | C+ | 2.30 |
| 90-96 | A | 4.00 | 70-72 | C | 2.00 |
| 87-89 | A- | 3.70 | 67-69 | C- | 1.70 |
| 83-86 | B+ | 3.30 | 63-66 | D+ | 1.30 |
| 80-82 | B | 3.00 | 60-62 | D | 1.00 |
| 77-79 | B- | 2.70 | Below 60 | F | 0.00 |