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Description automatically generated**COMSATS University Islamabad Department of Computer Science Course Syllabus**

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| **Course Information** |
| |  |  |  |  | | --- | --- | --- | --- | | Course Code: **CSC241** | | Course Title: **Object Oriented Programming** | | | Credit Hours: **4(3,1)** |  | Lecture Hours/Week: **3** |  | | Lab Hours/Week: **3** |  | Pre-Requisites: **CSC103-Programming Fundamentals** | | |
| **Catalogue Description:** |
| This course emphasizes the concepts of object-oriented techniques used in developing computer-based system. The topics include: Overview of Object-Oriented Programming; Classes & its Concepts; Problem Solving in Object Oriented Paradigm; Inheritance; Polymorphism; Library Components; Object Oriented Concepts of File Handling; Swing Classes; Events & Event Handlers; and Canonical Uses. |
| **Text and Reference Books:** |
| **Textbook:**  1. JAVA How to Program, 11th Edition, Paul Deitel and Harvey Deitel  **Reference Books:**   1. Concise Guide to Object-Oriented Programming, Kingsley Sage, Springer, 2019. 2. Absolute Java, Savitch, W. & Mock, K., Pearson, 2016. 3. Introduction to Java Programming and Data Structures, Comprehensive Version, Y. Liang, Y. Daniel Liang, Pearson, 2019. |
| **Week wise Plan:** |
| |  |  |  |  | | --- | --- | --- | --- | | **Lecture #** | **CDF**  **Unit #** | **Topics Covered** | **Reading**  **Material** | | 1. | 1 | Evolution of Object-Oriented Programming (OOP); Difference  between Object Oriented Approach & Modular/Structural Approach, and Object-Oriented Concepts & Principles. | Deitel: Ch01  Liang: Ch10 | | 2. | 2 | Definition of Classes: Fields & Methods, Creation of Objects, and  Understanding State of Object. | Deitel: Ch03, 06 | | 3. | 2 | Defining Constructors, and Concept of Overloaded Constructors. | Deitel: Ch08 | | 4. | 2 | Memory Allocation to Objects, Object as a Reference, Finalizer ()  Method, and Garbage Collection. | Liang: Ch9 | | 5. | 2 | Object-Oriented Idioms for Encapsulation: Privacy &  Visibility of Class Members, and Package Access. | Deitel: Ch08 | | 6. | 2 | Passing & Returning Objects from Methods, *This* Operator, and  Copy Constructors. | Deitel: Ch08 | | 7. | 2 | Static Data, and Methods. | Deitel: Ch08 | | 8. | 2 | Arrays | Deitel: Ch07 | | 9. | 2 | Arrays Object | Deitel: Ch07 | | 10. | 2 | Immutable Classes, and String as Immutable Class, Wrapper Classes. | Liang: Ch09,10 | | 11. | 3 | Class Diagram, Forward Engineering of Class Diagram to Code, Reverse Engineering of Code to Class Diagram, and  Decomposition into Objects. | Liang: Ch9 | | 12. | 3 | Composition, and Aggregation (Has–A Relationship). | Deitel: Ch09 | | 13. | 3 | Introduction to Inheritance & Subclasses, and Super Keyword. | Deitel: Ch09 | | 14. | 3 | Constructor Chaining, Object-Oriented Idioms for Encapsulation, (Protected Access Specifier), and Final Modifier. | Deitel: Ch09 | | 15. | 3 | Method Overriding, and Difference Between Overriding &  Overloading. | Deitel: Ch09 | | 16. | 3 | Object Class, and toString () Method. | Liang: Ch11 | | 17. |  | **Mid Term Exam** |  | | 18. |  |  | | 19. | 4 | Polymorphism & Dynamic Binding, Notion of Behavioral Replacement (Subtypes Acting like Super-Types); and  Relationship Between Sub-Typing & Inheritance. | Deitel: Ch10 | | 20. | 4 | Down Casting & Up Casting, and Equals () Method of Object  Class. | Deitel: Ch10 | | 21. | 4 | Abstract Classes, and Methods. | Deitel: Ch10 | | 22. | 4 | Interfaces & their Usage, and *Comparable* & *Cloneable*  Interfaces. | Deitel: Ch10 | | 23. | 4 | Array List Class. | Deitel: Ch07 | | 24. | 4 | Generic Types, and Static & Dynamic Typing. | Liang: Ch19 | | 25. | 5 | Introduction to File Handling / Database Connectivity | Deitel: Ch15 | | 26. | 5 | Binary Files (Object Streaming). /Database Connectivity | Deitel: Ch15 | | 27. | 5 | Object Serialization. | Liang: Ch17 | | 28. | 6 | GUI Components (Labels, Buttons, Text Field, Text Areas, Radio  Buttons, Combo Box, List View, and Scroll Bar). | Liang: Ch16 &  14 | | 29. | 6 | Containers, and Layout Managers. | Liang: Ch14 | | 30. | 6 | Introduction to Event Driven Programming, and Events &  Listeners. | Liang: Ch15 | | 31. | 6 | Listeners as Inner Classes, Anonymous Inner Classes, and Event  Handling using Lambda Expression. | Liang: Ch15 | | 32. | 6 | Using Reactive Framework, Externally-Generated Events,  Window Listeners, and Adapter Classes. | Savitch: Ch18 | | **Final Term Exam** | | | | |
| **Student Outcomes (SOs)** |
| |  |  | | --- | --- | | **S.#** | **Description** | | 1 | Apply knowledge of computing fundamentals, knowledge of a computing specialization, and mathematics, science, and domain knowledge appropriate for the computing specialization to the  abstraction and conceptualization of computing models from defined problems and requirements | | 2 | Identify, formulate, research literature, and solve *complex* computing problems reaching substantiated  conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines | | 3 | Design and evaluate solutions for *complex* computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health  and safety, cultural, societal, and environmental considerations | | 4 | Create, select, adapt and apply appropriate techniques, resources, and modern computing tools  to *complex* computing activities, with an understanding of the limitations | | 5 | Function effectively as an individual and as a member or leader in diverse teams and in multi-  disciplinary settings. | | 6 | Recognize the need, and have the ability, to engage in independent learning for continual development  as a computing professional | |
| **Course Learning Outcomes (CLOs)** |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Sr.#** | **Unit #** | **Course Learning Outcomes** | **Blooms Taxonomy**  **Learning Level** | **SO** | | **CLO’s for Theory** | | | | | | CLO-1 | 1-2 | Explain the concepts of Object-Oriented  Programming (OOP) paradigms. | *Understanding* | 1 | | CLO-2 | 3-4 | Design an Object-Oriented model for a real-world  problem. | *Creating* | 2,3 | | CLO-3 | 3-4 | Prepare a program reflecting Object-Oriented  concepts. | *Applying* | 2-4 | | **CLO’s for Lab** | | | | | | CLO-4 | 3-4 | Implement a small module utilizing Object-Oriented  design. | *Applying* | 2-4 | | CLO-5 | 1-6 | Develop a GUI based project for a real-world  problem in a team environment. | *Creating* | 2-5,9 | |
| **CLO Assessment Mechanism** |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Assessment**  **Tools** | **CLO-1** | **CLO-2** | **CLO-3** | **CLO-4** | **CLO-5** | | Quizzes | Quiz 1 | Quiz 2 | Quiz 3&4 | - | - | | Assignments | Assignment  1 | Assignment  2 | Assignment  3&4 | Lab Assignments | Lab Assignments | | Mid Term Exam | Mid Term Exam | Mid Term Exam | Mid Term Exam | - | - | | Final Term Exam | Final Term Exam | | | - | - | | Project | - | - | - | - | Lab Project | |
| **Policy & Procedures** |
| * **Attendance Policy:** Every student must attend 80% of the lectures as well as laboratory in this course. The students falling short of required percentage of attendance of lectures/laboratory work, is not allowed to appear in the terminal examination. * **Course Assessment:**  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  | **Quizzes** | **Assignments** | **Mid Term Exam** | **Terminal Exam** | **Total** | | **Theory (T)** | 15 | 10 | 25 | 50 | 100 | | **Lab (L)** | - | 25 | 25 | 50 | 100 | | **Final Marks (T+L)** | **(T/100) \*75 + (L/100) \*25** | | | | |  * **Missing Exam:** No makeup exam will be given for final exam under any circumstance. When a student misses the mid-term exam for a legitimate reason (such as medical emergencies), his grade for this exam will be determined based on the Department policy. Further, the student must provide an official excuse within one week of the missed exam. * **Academic Integrity:** All CUI policies regarding ethics apply to this course. The students are advised to discuss their grievances/problems with their counsellors or course instructor in a respectful manner. * **Plagiarism Policy:** Plagiarism, copying and any other dishonest behaviour is prohibited by the rules and regulations of CUI. Violators will face serious consequences. |