* 1. Description of Course CSE 2200

**Section A: General Information**

* + 1. Course Title Advanced Programming Laboratory
    2. Type of Course Compulsory, Sessional
    3. Offered to CSE
    4. Pre-requisite Course(s) None

**Section B: Course Details**

* + 1. Course Content (As approved by the Academic Council)

JAVA concepts, Review of OOP concepts, Inheritance and exception handling, Packages & interfaces, Graphical user interface (GUI), Layout, Custom view, Scalable user interface, User experience (UX), Multithreading, Socket programming, Activity, Services, Broadcast receiver, Content provider, Basic networking, Database manipulation and advanced APIs, Parsing (JSON, XML etc.). Students will submit individual small projects using advanced programming knowledge.

* + 1. Course Objectives
* Develop a comprehensive understanding of object-oriented programming (OOP) concepts, including inheritance, exception handling, packages, and interfaces, to equip students with the foundational knowledge necessary for effective Java development.
* Provide hands-on experience in designing and implementing Graphical User Interfaces (GUIs) and scalable user interfaces, enabling students to create intuitive and visually appealing applications that enhance user experience (UX).
* Equip students with the skills to utilize multithreading, socket programming, and other advanced networking techniques to develop robust and responsive applications capable of handling concurrent tasks and communicating efficiently over networks.
* Develop proficiency in utilizing Android components such as Activities, Services, Broadcast Receivers, and Content Providers, along with database manipulation and advanced APIs, empowering students to build feature-rich Android applications while adhering to industry standards and best practices.
  + 1. Knowledge required

Proficiency in any programming language concepts, including object-oriented programming principles, inheritance, and exception handling.

* + 1. Course Outcomes

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| **COs** | **CO Statements** | **Corresponding POs** | **Learning Domain and Taxonomy Levels** | **Delivery Methods and Activities** | **Assessment Tools** |
| 1 | Comprehend fundamental concepts of object-oriented programming, networking, UI/UX design, etc. | PO(a) | C2, A1 | Lectures, Lab demonstrations | Lab-tasks, Assignment, Lab-tests,  Lab-quiz |
| 2 | Demonstrate the ability to test, debug, and optimize applications to meet production requirements, while also maintaining software documentation. | PO(b) | C2, P2 |
| 3 | Design and implement software components using Java and Android. | PO(c), PO(e), PO(j) | C3, A2, P3, S3 |

\* For details of program outcome (PO) statements, please check Annex B, and for details of domains and taxonomy level, please check Annex C.

* + 1. Mapping of Knowledge Profile, Complex Engineering Problem Solving and Complex Engineering Activities

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| K1 | K2 | K3 | K4 | K5 | K6 | K7 | K8 | P1 | P2 | P3 | P4 | P5 | P6 | P7 | A1 | A2 | A3 | A4 | A5 |
| ✓ | ✓ | ✓ | ✓ |  | ✓ |  |  | ✓ | ✓ |  |  | ✓ |  |  | ✓ | ✓ | ✓ | ✓ | ✓ |

* + 1. Lecture Plan

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| **Weeks** | **Topics (According to syllabus)** | **Corresponding CO(s)** |
| 1 | Environment Setup, Basic Concepts of Java Programming | CO1, CO2, CO3 |
| 2 | Review of Object-Oriented Programming |
| 3 | Multithreading |
| 4 | SDKs, Packages and Interfaces |
| 5 | Graphical User Interface (GUI), Layout Design, Custom View Design |
| 6 | Basics of User Experience (UX) designing |
| 7 | Scalable User Interface, Custom View Design |
| 8 | Activity, Services and Broadcast Receiver |
| 9 | Basic Networking and Socket Programming |
| 10 | Parsing (JSON, XML etc.) |
| 11 | Database manipulation and advanced APIs |
| 12 | Project Presentation |
| 13 | Final Evaluation |

* + 1. Assessment Strategy
  + Class Participation: Class participation and attendance will be recorded in every class.
  + Continuous Assessment: Continuous assessment for any of the activities such as quizzes, spot tests, assignment, presentation etc. The scheme of the continuous assessment for the course will be declared on the first day of classes.
  + Final Examination: A comprehensive term final examination will be held at the end of the term following the guideline of academic council.
    1. Distribution of Marks

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| Class Participation, Attendance | 10% |
| Quizzes, Viva-Voce conducted in Lab Class | 20% |
| Viva-Voce Conducted Centrally | 20% |
| Performance and Report | 50% |
| Total | 100% |

* + 1. Textbook/References
* “Head First Java: A Brain-Friendly Guide” by O'Reilly Media, Inc
* “Android Programming: The Big Nerd Ranch Guide” by Big Nerd Ranch Guides.
* “Introducing JavaFX 8 Programming” by Herbert Schildt.