# Advanced Programming

**Course Outline (FALL 2016)**

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**Office Hours:** Wednesday 12:30 am to 1:30 pm

**Piazza Signup Link:** piazza.com/fast\_lahore/fall2016/cs433

**Access code for Signup:** cs433

***Objective***

This course is designed for students with prior knowledge of programming techniques and object oriented concepts. It builds on the basic Java concepts, and goes deeper into programming topics that help you to understand the more advanced Programming concepts.

At the end of the course, you will have a clear understanding of each of the topics of Advanced Java Programming, which will allow you to go more in-depth with the concepts of your choice.

***Prerequisites***

Object-Oriented Programming Concepts, Data Structures and Basic Databases Concepts

***Course Outline***

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| **Topics** | **No of Lectures** |
| * Introduction to JAVA and OOP concepts * JAVA Tools and IDE : Write, compile (using tool and command line) and debug programs * Data Types, Variables and Operators * String and StringBuffer class * Class Variables, methods and Blocks   o Instance variables and static varibles  o Instance methods and static methods  o Static and non-static blocks  o Inner classes  o this and super keywords     * Packages and Access Control   o Packages  o Access Modifiers  o Other Modifiers (final, static, abstract, native, synchronized, transient, volatile)   * Abstract Classes and Interfaces * Inheritance, Polymorphism and Encapsulation   o Basics of Inheritance, Using super to call super class constructors and methods  o Inheritance Hierarchy in Java and Universal superclass (The Object class)  o Compile time (early binding) vs Runtime Polymorphism (late  binding) | 7-8 |
| **Advanced Topics**   * Exception Handling * Generic Classes and Collections * JAVA GUI and Event Handling * Multi-Threads Programming and Synchronization * File Handling and Advanced Java Input/Output (NIO) * Database Programming with JDBC * Network Programming * Reflection * JAVA RMI * JAVA Web Applications (JSP, Servelts etc.) * Web application Frameworks (MVC: Struts, Hibernate) * Intro to Google App Engine (Cloud Computing) * Intro to Javascript, JQuery and AJAX | 20- 21 |

***Evaluation***

*Assignments/Quiz(s)/Homeworks* 20 - 25%

*Advanced topic Presentation*  10%

*Midterms* 25 - 30%

*Final Exam* 40 - 45%

***Total:*  100 %**

***Textbook(s) /Supplementary Readings***

1. *Herbert Schildts, The Complete Reference Java, 9th Edition*

2. Deitels and Santry, Advanced Java 2 Platform How to Program

3. *Effective Java Second Edition by Joshua Bloch*

4. *www.tutoriaslpoint.com/java/*

5. *www.javatpoint.com/java-tutorial*

6. http://docs.oracle.com/javase/tutorial/java

***Course Policies***

* *Weight age of Assignments and Project will be added to your final score only if you score passing marks in other evaluations. For example, if a student gets full marks in Assignments and Projects but he fails to score 50% in Midterms and final score,he will not be eligible for his practical work marks.*
* *Course outline may change 10-20% as we proceed in the semester*
* *Assignment deadlines for assignment and Project are hard.*
* *NO Cell Phone usage in class, they must be turned off at all times.*
* *Quizzes will be unannounced. We may have any number of quizzes at any time during the semester.*
* *There will be no retake of quizzes or exams.*
* ***Integrity in the assignments/quizzes is expected; otherwise result would be an F grade in the course or may be the case is forwarded to Disciplinary committee.***
* *Attendance MUST be ensured according to the University policy to avoid disqualification.*