BASIC OF COMPUTER PROGRAMMING AND ALGORITHMS (عال 202)

Course Description

This course gives an introduction about algorithms and programming. The course gives an overview about what an Algorithm is, how it can be designed, approaches for solving computational problem and finally a first interaction of student with computer programming to solve the problems using JAVA.

Course Objective

1. To understand the basics of computer Algorithms.
2. Be competent with writing computer design simple algorithms.
3. To make students familiar with computer based problems.
4. To make the students check the importance of algorithm designing and programming.
5. To make them capable of reading and understanding small-sized programs written by another author.
6. Become acquainted with the Java programming language and development environment.

References

Required & Recommended:

1. Fundamentals of Computer Algorithms Author(s): Ellis Horowitz, SartajSahni, Publisher: Computer Sci.P.
2. John C. Mitchell, Foundations for Programming Languages, MIT Press.
3. Benjamin C. Pierce, Types and Programming Languages, MIT Press.
4. Ravi Sethi, Programming Languages: Concepts and Constructs, Addison-Wesley
5. The Complete Reference, Java 2, Herbert Scheldt, Fifth Edition, Mc-Graw Hills/Osbourne.
6. Algorithm Design, Sartaj Sahni, Prentice Hall.

Prerequisite: Computer Skill (130 تقن)

Evaluation Method

1. Mid Term -1 : 20 Marks
2. Mid Term -2 : 20 Marks
3. Class Work (Attendance / Lab Work/ Quiz) : 20 Marks
4. Final Exam (End Term) : 40 Marks

Weeks	Topic Name	Sub Topic	Reading Chapter
1	**Introduction and overview**	• Introduction • Computer organization • Computer Languages • Generation of programing language • Stages in software development	
2 and 3	**Algorithms and flowcharts and PSEUDOCODE**	• Definition of Algorithm • Role of Algorithm in Computing • problems solving using algorithm • Flowcharting Symbols • General Rules for flowcharting • Limitations of Flowcharts • Advantages of Flowcharts • Flowcharting Tips • How to write pseudocode • Keywords used to write pseudocode • Advantages of Pseudocodes • Limitations of Pseudocodes • Practice and example using algorithms, Flowcharts and Pseudocodes	
4	**Variable and Data types**	• Data types • Data item (Constant, Variables) • Variable names • Assignment and expression • Practice and example using algorithms, Flowcharts and pseudocodes	
5and 6	**Structural programing (logical structures)**	• The sequence structure • Decisions structure: (Selection) • If Statement (Single Selection) • If – else Statement (double Selection) • Nested if Statement (multiple Selection)	

Weeks	Topic Name	Sub Topic	Reading Chapter
		• Switch Statement (The case statement) • Practice and example using algorithms, Flowcharts and Pseudocodes	
7	MID TERM – I		
8 and 9	**Loops structure (Repetition)**	• The For Loop • The While Loop • do – while • Practice and example using algorithms, flowcharts and Pseudocodes	
10	**Java**	• Introduction to Java environment • Development Environments • Java Program Structure • Comments • Identifiers • Reserved Words • Practice and example using java	
11	**Java**	• Variables and Data Types and • Variables Types in Java • Declaring Variables in Java • Assigning Values to Variables • Arithmetic expressions • Assignment operators • If statements • if...else • Practice and Example using Java	
12		**MID TERM – II**	
13 and 14	**Java**	• Nested if … else • Switch Statement • for loop	

Weeks	Topic Name	Sub Topic	Reading Chapter
		• while loops • do while loops • Practice and Example using Java	
15		**Revision & Final Exam**	