**National University** 



**Of Computer & Emerging Sciences**

**Karachi**

**Course Description of BS CS Degree Program**

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| **Course Instructor** | Nauman Atique/Muhammad Shahzad/Javeria Farooq | **Semester** | Fall  2017 |
| **Batch/Section(s)** | Session 2017 | **Year** | 2017 |
| **Course Title** | Introduction to Computing (CS-101) | **Credit Hours** | 3+1 |
| **Prerequisite(s)** | None | **Course TA** | 1AZZZ |

**Text Book(s)**

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| Title of book1 | Problem Solving and Program Design in C - 7th Edition | | |
| Author(s) | Jeri R. Hanly, Elliot B. Koffman | Publisher | Addison-Wesley  ISBN:978-81-317-2445-3 |
| Title of book2 | Computer Science a Breadth-First Approach with c |  |  |
| Author(s) | John Impagliazzo and Paul Nagin | Publisher | John Wiley and Sons ISBN: 0-471-58552-1 |

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| Title of book1 | Working with C / Let us C | Publisher | BPB Publications |
| Author(s) | Yashwant Kanetkar |  |  |
| Title of book2 | Waite Group’s Turbo C - Programming for the PC | Publisher | SAMS |
| Author(s) | Robert Lafore |  |  |

**Reference Book(s)**

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| **Course Description:** |
| How Computer Process data, Categories of programming languages, Difference between compiler and interpreter, Introduction to Programming, Basic Data Types, Conditional Statements, Looping Constructs , Array, Functions, Recursion, Filing in C, Structures, Pointer Data Type , Linked Lists, Sorting and Searching Algorithms, Stack and Queue. |

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| **Course Objective:** |
| 1. Getting students acquainted with Computer Science and problem solving. 2. Understanding the concept of Programming Languages. 3. Two major areas to be covered:    * 1. Computation and problem solving      2. Implementation in C language. |

**Tentative Lecture Schedule:**

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| |  |  |  |  | | --- | --- | --- | --- | | Week 1 | Introduction to Course related information, How computer Process data, and General introduction to Programming and problem solving. Software applications: MS-Word, MS-Powerpoint, MS-Excel, MS-Access. | Lecture 01 |  | | Component of computers: Control unit, ALU, memory unit, processor, registers, buses. | Lecture 02 |  | | Introduction to computer hardware and software, Computer categories: microcomputers, minicomputers, mainframes, supercomputers. | Lecture 03 |  | | Week 2 | Operating system concepts, Windows, Linux, Solaris, OS/2 | Lecture 04 |  | | Numbering systems and computer's internal data representation | Lecture 05 |  | | Advanced topics: multi-core technology, cloud computing, virtual reality, network security, web technologies. | Lecture 06 |  | | Week 3 | Introduction to Algorithms and flowcharts, Pseudocode, mathematical notations and functions | Lecture 07 |  | | Learning problem solving skills including input / output problems, expressing mathematical formula into algorithms and flowcharts | Lecture 08 |  | | Control structures, sequence and selection statements | Lecture 09 |  | | Week 4 | Problem solving example related to iterative statements. Nested loops in flowcharts | Lecture 10 |  | | Use of subprocesses in flow charts | Lecture 11 |  | | Use of multiway selection in flow charts | Lecture 12 |  | | Week 5 | Introduction to Interpreters and Compiler, C programming IDEs | Lecture 13 |  | | Basic constructs and Data Types including integer, float, char etc, | Lecture 15 |  | | Continued |  |  | | Week 6 | **Mid Term –I** |  |  | | Week 7 | Conditional Statements: if-else and nested if | Lecture 16 |  | | Switch statement and nested switch statements | Lecture 17 |  | | Ternary conditions | Lecture 18 |  | | Week 8 | Loops: for and while | Lecture 19 |  | | do-while loop | Lecture 20 |  | | Break and continue keyword | Lecture 21 |  | | Week 9 | Introduction to Functions and types of functions | Lecture 22 |  | | Recursion | Lecture 23 |  | | Recursion | Lecture 24 |  | | Week 10 | Preprocessor directives and macros | Lecture 25 |  | | Introduction to arrays, 1D arrays, declaration, initialization, accessing elements. | Lecture 26 |  | | Sorting and searching | Lecture 27 |  | | Week 11 | Multidimensional array, matrix application, more examples | Lecture 28 |  | | Continued | Lecture 29 |  | |  |  |  | | Week 12 | **Mid Term –II** |  |  | | Week 13 | Introduction to Strings in C and string I/O functions | Lecture 30 |  | | Introduction to Structures and Structure array | Lecture 31 |  | | Nested structures, more exercise on structures | Lecture 32 |  | | Week 14 | Introduction to Pointers, Pointers to array, double pointers. | Lecture 33 |  | | Dynamic memory allocation | Lecture 34 |  | | Continued | Lecture 35 |  | | Week 15 | Structure pointers | Lecture 36 |  | | Function pointers and Void pointers | Lecture 37 |  | | Continued | Lecture 38 |  | | Week 16 | Filing in C | Lecture 39 |  | | Revision | Lecture 40 |  | |  |  |  | | | | | | |  |  |  |
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**Grading Criteria:**

**Marks Distribution:**

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| **Particulars** | **% Marks** |
| Project | 10 |
| Quizzes | 5 |
| Assignments | 5 |
| Mid-I Exam | 15 |
| Mid-II Exam | 15 |
| Final Exam | 50 |
| **Total** | **100** |

**Lab Activities:**

There will be weekly labs starting from the first week.

The following is a summary of the Lab exercises given to Students.

* Introduction to Pseudo code, Algorithm and Flowchart and Programming Fundamentals.
* Introduction To Conditional Statement In C
* Control Structure(Repetition)
* Functions and Recursion.
* Arrays (1D, 2D, 3D)
* String sorting and searching algorithms.
* Pointers
* Dynamic memory allocation
* Structures
* Filling in C

**Project:**

The end of semester project is an application of the concepts and theory discussed in the course. It helps clarify the issues related to the concepts. The end of semester project is assigned to students in the form of groups, each group comprising of at the most three students. Each group is assigned a separate project. The deliverables include a report, a demonstration of the results achieved and an oral test related to the project. A few sample projects are:

• Tic-Tac-Toe game

• Student Management System.

• Library Management System.

• Chat Room

• Resource Monitor.

• Typing Tutor.

• Quiz Game.

**Important Instructions to be followed for this Course**

* **Be in classroom on time. Any student who arrives more than 5 min  
  late in the class would be marked LATE. Anybody coming to class  
  more than 15 minutes late will be marked ABSENT.**
* **Turn off your cell phones or any other electronic devices before entering the class.**
* **Maintain the decorum of the class room all the time.**
* **Avoid a conversation with your classmates while lecture is in progress.**
* **Use parliamentary language in the class room as well as in  
  assignments. Refrain from using impolite, vulgar or abusive language  
  in the class room as well as in class presentations and assignments.**
* **Submit your assignments on time, no assignment will be accepted after the deadline.**
* **There would be no re- take of any quiz.**

**Instructions / Suggestions for satisfactory progress in this course:**

* On average, most students find at least three hours outside of class for each class hour necessary for satisfactory learning.
* Chapters should be read and homework should be attempted before class.
* Do not get behind. You are encouraged to work with other students. Plus, I am always available during office hours to help you.
* The homework assigned is a minimum. You may always work extra hours on your own.
* Use the few minutes you usually have before the start of each class to review the prior meetings’ notes and homework. This will save us valuable in-class time to work on new material.
* Develop a learning habit rather than memorizing.
* Work in groups, whenever appropriate.
* Apply the learned principles and gained knowledge.
* Be creative in thinking, but stick to the topic assigned for discussions, assignments and presentations.
* Always bring your text Books with you in the class

**Note:** Students are welcome all the time to get help from the Teacher

Signature:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_