KING FAHD UNIVERSITY OF PETROLEUM & MINERALS  
*COMPUTER ENGINEERING DEPARTMENT*

ICS 103: Computer Programming in C

**Term 093 Lecture Breakdown**

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| **Lec#** | **Date** | **Topics** | **Ref.** |
| 1 | S 3/7 | Syllabus. Course Introduction. |  |
| 2 | U 4/7 | Overview of Computers, Hardware & Software, Computer Hardware Components of a Computer, Memory, Computer Software, Computer Languages. | 1.1-1.5, H1 |
| 3 | M 5/7 | Compiler, Software Development Method, Pseudo code & Flowchart. | 1.1-1.5, H1 |
| 4 | T 6/7 | Overview of C: History & Philosophy, Why C? What’s Missing? General Form of a C program: Preprocessor Directives, Comments, The “main” Function, Variables and Data Types. | 2.1-2.5, H2, H3 |
| 5 | S 10/7 | Executable Statements, Input/Output Operations and Functions, The printf Function, The scanf Function, Assignment Statements, return Statement, Reserved Words, Identifiers. | 2.1-2.5, H2, H3 |
| 6 | U 11/7 | Punctuation and Special Symbols, Formatting Numbers in Program Output. C Arithmetic Expressions, C Operators, Data Type of an Expression, Mixed-Type Assignment Statement, Type Conversion Through Casts, Expressions with Multiple Operators, Rules for Evaluating Expressions. | 3.1-3.3, H4 |
| 7 | M 12/7 | Rules for Evaluating Expressions, Writing Mathematical Formulas in C, Programming Style, Bad Programming practices. Introduction to Functions, Predefined Functions and Code Reuse, Some Mathematical Library Functions. Simple User-defined Functions. | 3.1-3.3, H4  3.4,3.5, H5 |
| 8 | T 13/7 | Function Prototypes, Function Definition, Placement of Functions in a program, Execution Order of Functions. (**Quiz#1**) | 3.4,3.5, H5 |
| 9 | S 17/7 | Control Structures, Compound Statements, Conditions, Relational and Equality Operators, Logical Operators. Operator Precedence, Character Comparison, Logical Assignment, Complementing a condition, DeMorgan’s Theorem, ***if*** statement: Two alternatives, One alternative, Nested if Statements. | 4.1-4.7, H6 |
| 10 | U 18/7 | Multiple-Alternative Decision Form, Common if statement errors. Switch statement. | 4.1-4.7, H6 |
| 11 | M 19/7 | Nested if versus switch, Common Programming Errors. Repetition in Programs, Counting Loops, While Statement, Compound Assignment Operators, For Statement, Increment and Decrement Operators. | 4.6-4.7, H6  5.1-5.5, H7 |
| 12 | T 20/7 | Prefix and Postfix Increment/Decrement. Conditional Loops, Sentinel Controlled Loops, Nested Loops. | 5.5-5.8, H7 |
|  | W 21/7 | Major Exam I |  |
| 13 | S 24/7 | Do While Loop. Why data files? Steps For Using Data Files, Declaring FILE pointer variables, Opening data files for input/output, Scanning from and printing to data files, Closing input and output files, Handling File not found error, EOF-controlled Loops. | 5.6-5.8, H7 &  2.6, H8 |
| 14 | U 25/7 | Types of Functions, void Functions with Input Arguments, Actual Arguments & Formal Parameters, Writing Modular Programs using Functions. | 6.1, H9 |
| 15 | M 26/7 | Functions with Input Argument and a Single Result. Re-usability of Functions, Logical Functions, Functions with Multiple Arguments, Function Data Area, Testing Functions Using Drivers, Why do we use Functions? Common Programming Errors. | 6.1, H9 |
| 16 | T 27/7 | Introducing Functions that return multiple results, What is a Pointer variable? (**Quiz#2**) | 6.3 , 6.5, H10 |
| 17 | S 31/7 | Functions returning multiple results, Triple use for Asterisk (\*), Examples of Functions Returning Multiple Results. Introducing Recursive Functions, Format of recursive Functions, Recursive Factorial, Tracing Recursive Functions, Recursive Multiplication, Recursive Power Function. Recursive Fibonacci Function, Tracing using Recursive Tree. | 6.3 , 6.5, H10  6.6, H11 |
| 18 | U 1/8 | What is an Array? Declaring Arrays, Array Initialization, Array Subscripts, Accessing Array Elements. Array Examples. | 7.1-7.3, H12 |
| 19 | M 2/8 | Using array elements as function arguments: Examples. Using arrays as function arguments. | 7.4, H13 |
| 20 | T 3/8 | Returning an array result: Examples.Partially filled Arrays. **(Quiz#3)** | 7.4, H13 |
| 21 | S 7/8 | Introduction to Searching, Linear Search Algorithm, Binary Search Algorithm, Binary Search Implementation. Introduction to Sorting. Selection Sort Algorithm, Selection Sort Implementation. | 7.5, H14 |
| 22 | U 8/8 | Selection Sort Implementation, Bubble Sort Algorithm, Bubble Sort Implementation. What is a String? Input/Output with printf and scanf. | 7.5, H14  7.6, H15 |
| 23 | M 9/8 | Input/Output with fgets and fputs, String Copy (strcpy), String Length (strlen), String Comparison (strcmp). | 7.6, H15 |
| 24 | T 10/8 | Review for Major Exam II. |  |
|  | Th 12/8 | Major Exam II |  |
| 25 | S 14/8 | String Concatenation (strcat), String Tokenization (strtok), Searching a string (strchr and strstr), Character Related functions. | 7.6, H15 |
| 26 | U 15/8 | Introduction to 2-D Arrays, Declaration of 2-D Arrays, Accessing 2-D Array elements, Initialization of 2-D Arrays, Processing 2-D Arrays. 2-D Arrays as parameters to functions. 2-D Arrays Example Programs. | 8.1, H16 |
| 27 | M 16/8 | Array of Strings, Input/Output with Arrays of Strings, Use of *break* in loops, Use of *continue* in Loops. | 8.2,8.3, H17 |
| 28 | T 17/8 | Review for Final Exam. |  |
| 29 | S 21/8 | **(Quiz#4)** |  |
| 30 | U 22/8 | Review for Final Exam. |  |