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

ICS 103: Computer Programming in C

**Term 103 Lecture Breakdown**

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| **Lec#** | **Date** | **Topics** | **Ref.** |
| 1 | S 25/6 | Syllabus. Course Introduction. |  |
| 2 | U 26/6 | Overview of Computers, Hardware & Software, Computer Hardware Components of a Computer, Memory, Computer Software, Computer Languages, Compiler. | 1.1-1.5, H1 |
| 3 | M 27/6 | Software Development Method, Pseudo code & Flowchart. Overview of C: History & Philosophy, Why C? What’s Missing? | 1.1-1.5, H1  2.1-2.5, H2, H3 |
| 4 | T 28/6 | General Form of a C program: Preprocessor Directives, Comments, The “main” Function, Variables and Data Types. Executable Statements, Input/Output Operations and Functions, the printf Function, the scanf Function. | 2.1-2.5, H2, H3 |
| 5 | S 2/7 | Assignment Statements, return Statement, Reserved Words, Identifiers. Punctuation and Special Symbols, Formatting Numbers in Program Output. | 2.1-2.5, H2, H3 |
| 6 | U 3/7 | 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. Writing Mathematical Formulas in C, Programming Style, Bad Programming practices. | 3.1-3.3, H4 |
| 7 | M 4/7 | Introduction to Functions, Predefined Functions and Code Reuse, Some Mathematical Library Functions. Simple User-defined Functions. Function Prototypes, Function Definition, Placement of Functions in a program, Execution Order of Functions. | 3.4,3.5, H5 |
| 8 | T 5/7 | Control Structures, Compound Statements, Conditions, Relational and Equality Operators, Logical Operators. Operator Precedence. (**Quiz#1**) | 4.1-4.7, H6 |
| 9 | S 9/7 | Character Comparison, Logical Assignment, Complementing a condition, DeMorgan’s Theorem, ***if*** statement: Two alternatives, One alternative, Nested if Statements. Multiple-Alternative Decision Form. | 4.1-4.7, H6 |
| 10 | U 10/7 | Common if statement errors. Switch statement. Nested if versus switch, Common Programming Errors. | 4.1-4.7, H6 |
| 11 | M 11/7 | Repetition in Programs, Counting Loops, While Statement, Compound Assignment Operators, For Statement. | 5.1-5.5, H7 |
| 12 | T 12/7 | Increment and Decrement Operators. Prefix and Postfix Increment/Decrement. Conditional Loops, Sentinel Controlled Loops, Nested Loops. Do While Loop. | 5.5-5.8, H7 |
|  | W 13/7 | Major Exam I |  |
| 13 | S 16/7 | 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 &  2.7, H8 |
| 14 | U 17/7 | Types of Functions, void Functions with Input Arguments, Actual Arguments & Formal Parameters, Writing Modular Programs using Functions. | 6.1, H9 |
| 15 | M 18/7 | 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? | 6.1, H9 |
| 16 | T 19/7 | Common Programming Errors. (**Quiz#2**) | 6.1, H9 |
| 17 | S 23/7 | Introducing Functions that return multiple results, What is a Pointer variable? Functions returning multiple results, Triple use for Asterisk (\*), Examples of Functions Returning Multiple Results. | 6.3 , 6.5, H10 |
| 18 | U 24/7 | Introducing Recursive Functions, Format of recursive Functions, Recursive Factorial, Tracing Recursive Functions, Recursive Multiplication, Recursive Power Function. Recursive Fibonacci Function, Tracing using Recursive Tree. | 6.6, H11 |
| 19 | M 25/7 | What is an Array? Declaring Arrays, Array Initialization, Array Subscripts, Accessing Array Elements. Array Examples. | 7.1-7.3, H12 |
| 20 | T 26/7 | Using array elements as function arguments: Examples. Using arrays as function arguments. | 7.4, H13 |
| 21 | S 30/7 | Returning an array result: Examples.Partially filled Arrays. **(Quiz#3)** | 7.4, H13 |
| 22 | U 31/7 | Introduction to Searching, Linear Search Algorithm, Binary Search Algorithm, Binary Search Implementation. Introduction to Sorting. Selection Sort Algorithm, Selection Sort Implementation. | 7.5, H14 |
| 23 | M 1/8 | Bubble Sort Algorithm, Bubble Sort Implementation. What is a String? Input/Output with printf and scanf. Input/Output with gets and puts. | 7.5, H14  7.6, H15 |
| 24 | T 2/8 | Review for Major Exam II. |  |
|  | W 3/8 | Major Exam II |  |
| 25 | S 6/8 | Input/Output with gets, fgets, puts and fputs. | 7.6, H15 |
| 26 | U 7/8 | String Copy (strcpy), String Length (strlen), String Comparison (strcmp), String Concatenation (strcat), String Tokenization (strtok), Searching a string (strchr and strstr). | 7.6, H15 |
| 27 | M 8/8 | Character Related functions. 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. | 7.6, H15  8.1, H16 |
| 28 | T 9/8 | Array of Strings, Input/Output with Arrays of Strings, Use of *break* in loops, Use of *continue* in Loops. | 8.2,8.3, H17 |
| 29 | S 13/8 | Review for Final Exam. |  |
| 30 | U 14/8 | **(Quiz#4)** |  |