



COURSE DESCRIPTION FORM

INSTITUTION National University of Computers and Emerging Sciences

BS Computer Science

PROGRAM (S) TO BE

EVALUATED

A. Course Description

(Fill out the following table for each course in your computer science curriculum. A filled-out form should not be more than 2-3 pages.)

Course Code	CS1002
Course Title	Programming Fundamentals
Credit Hours	3+1
Prerequisites by Course(s) and Topics	None
Assessment Instruments with Weights (homework, quizzes, midterms, final, programming assignments, lab work, etc.)	Theory: Mid-1:15 Mid-2:15 Assignment: 10 (Three Assignments) Quizzes: 10 (Three Quizzes) Final:50 Lab: Lab activities: 20(Best 10: 2 each) Midterm: 20 Project: 10 Final: 50
Course Coordinator	Basit Ali
URL (if any)	
Current Catalog Description	

Textbook (or Laboratory Manual for Laboratory Courses)	<u>Name:</u> C How to Program with an Introduction to C Global Edition - 7th Edition <u>Authors:</u> Paul Deitel, Harvey Deitel <u>Publisher:</u> Pearson <u>Name:</u> Problem Solving and Program Design in C - 7th Edition <u>Authors:</u> Maureen Sprankle , Jim Hubbard <u>Publisher:</u> Prentice Hall																																			
Reference Material	Name: Working with C / Let us C <u>Author(s):</u> YashwantKanetkar <u>Publisher:</u> BPB Publications Name: Waite Group’s Turbo C - Programming for the PC <u>Authors:</u> Robert Lafore <u>Publisher:</u> SAMS																																			
Course Goals	<table><tr><th colspan="3">A. Course Learning Outcomes (CLOs)</th><th>Level</th></tr><tr><td colspan="3">CLO 1: Describe fundamental concepts of structured and procedural programming, use pseudo-codes and simple programs to understand control structures, iterative structures and functions using C language.</td><td>C3, PLO1</td></tr><tr><td colspan="3">CLO 2: Examine code writing, compiling, debugging and program execution.</td><td>C3, PLO5</td></tr><tr><td colspan="3">CLO 3: Justify problem solving techniques and analytical thinking by identifying the concepts and properties of algorithms.</td><td>C5, PLO2</td></tr><tr><td colspan="3">CLO 4: Design basic problems of the real world through small/medium size programs given as course projects.</td><td>C6, PLO5</td></tr></table> <table><tr><th colspan="4">B. Program learning outcomes (PLO)</th></tr><tr><td>PLO 1</td><td>Computing Knowledge</td><td>Apply knowledge of mathematics, natural sciences, computing fundamentals, and a computing specialization to the solution of complex computing problems.</td><td>?</td></tr><tr><td>PLO 2</td><td>Problem Analysis</td><td>Identify, formulate, research literature, and analyse complex computing problems, reaching substantiated conclusions using first principles of mathematics, natural sciences, and computing sciences.</td><td>?</td></tr></table>				A. Course Learning Outcomes (CLOs)			Level	CLO 1: Describe fundamental concepts of structured and procedural programming, use pseudo-codes and simple programs to understand control structures, iterative structures and functions using C language.			C3, PLO1	CLO 2: Examine code writing, compiling, debugging and program execution.			C3, PLO5	CLO 3: Justify problem solving techniques and analytical thinking by identifying the concepts and properties of algorithms.			C5, PLO2	CLO 4: Design basic problems of the real world through small/medium size programs given as course projects.			C6, PLO5	B. Program learning outcomes (PLO)				PLO 1	Computing Knowledge	Apply knowledge of mathematics, natural sciences, computing fundamentals, and a computing specialization to the solution of complex computing problems.	?	PLO 2	Problem Analysis	Identify, formulate, research literature, and analyse complex computing problems, reaching substantiated conclusions using first principles of mathematics, natural sciences, and computing sciences.	?
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	PLO 3	Design/Develop Solutions	Design solutions for complex computing problems and design systems, components, and processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.	
	PLO 4	Investigation& Experimentation	Conduct investigation of complex computing problems using research-based knowledge and research-based methods	
	PLO 5	Modern Tool Usage	Create, select, and apply appropriate techniques, resources and modern computing tools, including prediction and modelling for complex computing problems.	2
	PLO 6	Society Responsibility	Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal, and cultural issues relevant to context of complex computing problems.	
	PLO 7	Environment and Sustainability	Understand and evaluate sustainability and impact of professional computing work in the solution of complex computing problems	
	PLO 8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of computing practice.	
	PLO 9	Individual and Team Work	Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.	
	PLO 10	Communication	Communicate effectively on complex computing activities with the computing community and with society at large.	
	PLO 11	Project Management and Finance	Demonstrate knowledge and understanding of management principles and economic decision making and apply these to one's own work as a member or a team.	
	PLO 12	Life Long Learning	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological changes.	

C. Relation between CLOs and PLOs (CLO: Course Learning Outcome, PLOs: Program Learning Outcomes)													
		PLOs											
		1	2	3	4	5	6	7	8	9	10	11	12
CLOs	1	?											
	2					?							
	3		?										
	4					?							
Topics Covered in the Course, with Number of Lectures on Each Topic (assume 15-week instruction and one-hour lectures)													
Week	Topics								CLO	Assessment			
Week 1	Discussion of the course outline, Introduction to problem solving, what is algorithm, how to write pseudo code, programming structures, problem solving with the sequential structures and, Basic Flowchart, IPO and PAC								1				
Week 2	1. Daily life real world problems 2. Flowchart in depth, Extended flowchart & Algorithms 3. Working examples								1,2	Project Announcement			
Week 3	Problem solving with decisions, Basic Computer Organization, Intro to IDE (compiled program, text editors, debuggers, etc.), Library, Linking, Compiling & Loading. Program structure and Execution, First Program with Input and Output, Constant, Variables, Keywords, Escape sequence, Format Specifiers, Data types, Data manipulation.								2,3	Release of Assignment 1 By the end of Week 3			
Week 4	1. Decision Control Structures: If statements and if-else statement 2. Nested if statements								2,3	Quiz #1			
Week 5	1. Switch statements. Nested Switches. 2. Logical, Conditional Operators, bit wise operator, modulus and other helpful operators								2,3,5	Assignment 1 submission By the end of Week 5			

	Week 6	MID I Examination			
	Week 7	1. Basic loops: for, while and do-while 2. Referencing 3. Introduction to pointer (Just referencing)	2,3,5		
	Week 8	Loops with 1D arrays	2,3,4,5	Release of Assignment 2 By the end of Week 8	
	Week 9	Nested Loops with N-D arrays	2,3,4,5	Quiz 2	
	Week 10	1. Functions: Declaration, Definition and Calling, passing values to functions, Passing arrays to functions 2. Standard library string functions 2D array of characters	2,3,4,5	Assignment 2 submission By the end Week 10	
	Week 11	MID II Examination			
	Week 12	1. Recursion (types, stack calling) 2. Constant & Static 3. Introduction to Structures	3,4,5	Release of Assignment 3 By the end of Week 12	
	Week 13	1. Nested Structure, Composition and Structure array 2. Filing in C	3,4,5,6	Quiz 3	
	Week 14	1. Filing in C (continue if needed) 2. Single Pointer(including structure) with DMA	2,3,4,5, 6	Assignment 3 submission By the end Week 14	
	Week 15	1. 2D pointers with DMA 2. Pointers with functions (Pass by value & reference, returning from function.	3,5		
	Week 16	Case studies & Revision			
	Laboratory Projects/Experiments	There will be weekly labs starting from the first week. The following is a summary of the Lab exercises given to Students. ● Introduction to Problem solving statements.			

Topics Done in the Course	<ul style="list-style-type: none"> ● Introduction To Conditional Statement In C ● Control Structure (Repetition) ● GitHub ● Functions and Recursion. ● Arrays (1D, 2D, 3D) ● String sorting and searching algorithms. ● Pointers ● Dynamic memory allocation ● Structures ● Filing in C 			
Programming Assignments Done in the Course	Assignment related to Functions, Arrays, Pointers, Structures, Dynamic Memory and File Processing will be done			
Class Time Spent on (in credit hours)	Theory	Problem Analysis	Solution Design	Social
	15%	50%	30%	5%
Oral and Written Communications	Every student is required to submit at least _1_ written reports of typically _2_ pages and to make _1_ oral presentations of typically _10_ minute's duration. Include only material that is graded for grammar, spelling, style, and so forth, as well as for technical content, completeness, and accuracy.			

Instructor Name ____ **Basit Ali** ____

Instructor Signature _____

Date _8/Aug/2024_