هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد
NCAAA

2024
TP-154

Course Report
(Bachelor)

Course Title:	Algorithms & Programming
Course Code:	CSC 281
Program:	Bachelor in Science
Department:	Mathematics
College:	College of Science
Institution:	Jazan University
Version:	V3
Last Revision Date:	10 January 2025

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A. General information about the course:

1. Course Identification

1. Credit hours: (03)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (Level 04 / Year 02)					
4. Course General Description:					
This course introduces the fundamental concepts of Algorithm and Programming. It includes the basic concept of Algorithm: Flow chart and Pseudocode, Searching and sorting Algorithm , Basic Concept of Programming Language, Programming with C Language, Control Statements: Decision and Repetition, Functions : Library and user defined, Array: One dimensional and two dimensional, String and Pointers.					
5. Pre-requirements for this course (if any)**:**					
Nil					
6. Pre-requirements for this course (if any)**:**					
Nil					
7. Course Main Objective(s):					
1. **Discuss the basic of Algorithms, Algorithm Representation Techniques: Flow chart and pseudocode.** 2. **Discuss various searching and sorting Algorithms.** 3. **Discuss Evolution and Types of Language.** 4. **Explain the basic concept of C Programming such as character set, identifier, keywords, escape sequence, decision and repetition control statement, break, goto etc.** 5. **Discuss Arrays and Strings.** 6. **Explain basic concept of Function and Pointers.** 7. **Write and implement various programs using C in the lab, to demonstrate the concepts of C Language.**					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100%

No	Mode of Instruction	Contact Hours	Percentage
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning (Self-Learning)		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	15
3.	**Field**	--
4.	**Tutorial**	--
5.	**Others (specify)**	4
Total		45

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	***Describe*** algorithm, flow chart, pseudocode, basic algorithms, searching and sorting algorithms	K1	• Lectures/Presentations Media Lectures	• Mid-Term Exam • Assignment- 1 • Final Theory Exam
1.2	***Define*** the types of programming languages and the basic concept of C Programming Language such as character set, identifier, keywords, escape sequence, decision and repetition control statement, break, goto, arrays, strings etc.	K2	• Lectures/Presentations Media Lectures	• Mid-Term Exam • Assignment- 2 • Final Lab Exam • Final Theory Exam

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.0	**Skills**			
2.1	***Utilize*** flowcharts and pseudocode to understand the program modules.	S2	• Lectures /Presentations • Media Lectures Tutorials	• Assignment - 1 • Assignment – 2 Final Theory Exam
2.2	***Develop*** programs to implement C concepts.	S2	• Lectures /Presentations • Media Lectures Tutorials	• Mid Term Exam • Assignment – 1 • Final Theory Exam
2.3	***Show*** the ability to find errors in the programs and fix them.	S1	• Lectures /Presentations • Media Lectures Tutorials	• Mid Term Exam • Assignment -1 • Final Theory Exam
3.0	**Values, autonomy, and responsibility**			
3.1	**Demonstrate** the ability to work in a group to achieve common assignments and activities in the field of algorithms and programming.	V2	Group Discussion	Assignment – 2 (Group Assignment),

C. Course Content

No	List of Topics	Contact Hours
1.	**ALGORITHM**: Definition of an Algorithm, Three construct for algorithm- sequence, decision, repletion. Algorithm Representations: flowchart, pseudocode. Basic Algorithm: Summation, Product, smallest, Largest. **SORTING:** Selection **SEARCHING:** Sequential Search and Binary Search. **APPROACHES FOR ALGORITHM:** iteration, recursion..	6T + 3 P
2.	**CHAPTER -2** **PROGRAMMING LANGUAGE:** Evolution-Machine Language, Assembly Language, High Level Language, Natural Language.	2T + 1P

	PROGRAM: Definition, Building a program-Writing and Editing Program, Compiling Program,Linking Program, Program Execution. **CATEGORIES OF PROGRAMMING LANGUAGE:** Functional Language, Object Oriented Language, Declarative Language. High Level Language, Special Languages.	
3.	**CHAPTER -3** **C FUNDAMENTALS:** A brief history of C, Structure of a program, The character set, Identifiers, key words, data Types, Modifying Basic Types, Escape sequences, Variables, Initializing Variables, Storage Classes. **CONSTANTS:** Literal Constants, Named Constant, Symbolic constant. **EXPRESSION:** Operators: Arithmetic Operator, Unary Operator: The decrement and increment Operator, Relational Operator, Logical Operators, Assignment Operators, Conditional Operators and Operands. **STATEMENTS:** Expression statements, Compound statements, Control statements. Order of Precedence.	6T + 3P
4.	**CHAPTER -4** **FUNCTIONS:** Data Input Output Function, Scanf Function, printf Function, format specifiers. **USER DEFINED FUNCTIONS:** Defining a function, Accessing a function, Function prototype, Passing arguments to a function, Recursion. Library Functions	4T +2P
5.	**CHAPTER -5** **CONTROL STATEMENTS**: **BRANCHING:** if else statement, Nested if statement, Ladder if statement, Switch Statement. **LOOPING:** The while statement, do while statement, for loop, break statement, GO TO statement. continue Statement	4T + 2P
6.	**ARRAYS:** Defining an array, Array Initialization, Processing one-dimensional array, Two Dimensional Array. **STRINGS:** Introduction to strings, Manipulating Strings. **POINTERS:** Introduction to pointers, Pointers to variables, Dereferencing the Pointers.	2T + 1P
Total		**24T + 12P**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exam	7th-8th week	15%
2.	Assignment I	9th week	10%
3.	Assignment II (Case Study/ Group assignment)	12th week	15%
4.	Lab Exam	14th Week	20%
5.	Final Theory Exam	15th Week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Algorithms in a Nutshell, George T. Heineman, Gary Pollice, Stanley Selkow, O'Reilly Media, Inc., 2nd Edition, 2015, ISBN-13: 978-1491948927
Supportive References	Programming in ANSI C, E. Balagurusamy, Tata McGraw-Hill Education, 7th Edition, 2016, ISBN-13 : 978-9339219666
Electronic Materials	https:// www.eccouncil.org
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	• Classroom equipped with projector, whiteboard, and sufficient seating arrangements. • Lab with software installed and an individual computer terminal for each student.
Technology equipment (projector, smart board, software)	• Whiteboards and projectors for classroom and labs Following software for lab work: • Turbo C
Other equipment (depending on the nature of the specialty)	**None**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect (Course evaluation survey form)
Effectiveness of Students assessment	CRC / QAU / HoD	Direct (Course reports/result analysis)
Quality of learning resources	Track leaders / CRC	Indirect (Review, meetings, and star rating with suggestions for further modification and improvements)
The extent to which CLOs have been achieved	CRC / QAU	Direct (CLO assessment template further verified at course coordinator, Track leader and QAU level)
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL
REFERENCE NO.	
DATE	18/08/2024