

Program : Diploma in Computer Engineering / Computer Hardware Engineering/ Information Technology / Cloud Computing and Bigdata / Cyber Forensics and Information Security / Communication and Computer Networking	
Course Code : 2131	Course Title: Problem Solving and Programming
Semester : 2	Credits: 3
Course Category: Engineering Science	
Periods per week: 3 (L:3 T:0 P:0)	Periods per semester: 45

Course Objectives:

- Provide an exposure to problem solving through programming.
- Learn programming essentials including algorithms, flow charts, data types, elementary control structures, functions and arrays.
- Write well structured programs in C Language.
- Easily switch over to any other programming language in future.

Course Prerequisites:

Topic	Course code	Course name	Semester
Basic knowledge in Computer systems		Introduction to IT systems Lab	1

Course Outcomes:

On completion of the course, the student will be able to:

CO _n	Description	Duration (Hours)	Cognitive Level
CO1	Develop algorithmic solutions to problems and translate the solutions into programs.	8	Applying
CO2	Use different control structures to solve problems.	15	Applying
CO3	Apply the concept of modular program design to solve problems effectively.	8	Applying
CO4	Develop programs using one dimensional and two dimensional arrays.	12	Applying
	Series Test	2	

CO – PO Mapping

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3						
CO2	3						
CO3	3						
CO4	3						

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	Develop algorithmic solutions to problems and translate the solutions into programs.		
M1.01	Develop algorithms and flowcharts to solve problems.	2	Applying
M1.02	Illustrate the steps in Program Development.	1	Understanding
M1.03	Explain data types, variables, constants, expressions, operators, input, output and basic program structure in C.	2	Understanding
M1.04	Develop C programs to solve simple real world problems.	3	Applying
<p>Contents:</p> <p>Introduction to Problem Solving – Algorithms, flowcharts – Program Development Cycle – problem analysis, program design, coding, testing, documentation – Steps in Compiling and executing a program.</p> <p>General Structure of C Program – Identifiers and Keywords – Data types – Constants – Variables – Declarations – Arithmetic, Relational, logical, Conditional, Unary, Increment and Decrement operator, assignment operators, etc – Precedence and Associativity of Operators – Expressions and Evaluation of expressions – Type casting– input and output using printf() and scanf() – built-in functions – Comments.</p>			
CO2	Use different control structures to solve problems.		
M2.01	Illustrate different selection control statements to choose among alternative actions.	2	Understanding
M2.02	Illustrate the use of relational and logical operators to form complex conditional expressions in control statements.	1	Understanding

M2.03	Make use of selection statements in C to solve problems	4	Applying
M 2.04	Illustrate different looping statements in C to execute statements repeatedly in a program.	1	Understanding
M 2.05	Build programs using different looping statements in C	4	Applying
M 2.06	Differentiate Counter-controlled repetition and sentinel-controlled repetition	2	Understanding
M 2.07	Illustrate how break and continue statements alter the flow control in a program.	1	Understanding
	Series Test – I	1	
<p>Contents:</p> <p>Conditional Control Structures – if, if – else, if – else ladder, nested if, switch -case, goto, conditional operator, Relational and logical operators.</p> <p>Different looping statements – while, do-while and for loops, Counter-controlled and Sentinel controlled loops, break and continue statements.</p>			
CO3	Apply the concept of modular program design to solve problems effectively.		
M3.01	Explain modular programming concepts to solve programs effectively.	1	Understanding
M3.02	Explain passing arguments to functions	2	Understanding
M3.03	Develop user defined functions and make use of user defined functions in programs	5	Applying
<p>Contents:</p> <p>Functions – user defined functions and built-in functions, Function definition, function call, function prototypes, Passing arguments to functions.</p>			
CO4	Develop programs using one dimensional and two dimensional arrays.		
M 4.01	Explain the definition, initialization, and processing of one dimensional arrays with examples.	2	Understanding
M 4.02	Use one dimensional arrays to solve problems.	4	Applying
M 4.03	Explain the definition, initialization and processing of two dimensional arrays with examples.	2	Understanding
M 4.04	Develop programs using two dimensional arrays.	4	Applying
	Series Test – II	1	

Contents:

Defining, initializing and accessing of one dimensional arrays – Programs using one dimensional array.

Defining, initializing and accessing of two dimensional arrays – Programs using two dimensional arrays.

Text / Reference

T/R	Book Title/Author
T1	Balagurusamy E, Programming in ANSI C 7 th Ed.
T2	Byron Gottfried - Schaum's Outline Of Programming With C
R1	Yashavant Kanetkar, Let Us C
R2	Paul J. Deitel, Harvey Deitel, C How to Program
R3	Herbert Schild, C: The Complete Reference
R4	Venit, S & Drake E., Prelude to Programming : Concepts & Design, 4th Ed. , Addison-Wesley (Pearson)

Online Resources

Sl.No	Website Link
1	https://nptel.ac.in/courses/106104128/
2	https://www.programiz.com/c-programming
3	https://www.tutorialspoint.com/cprogramming/index.htm