# Mahatma Gandhi University
# Kottayam

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| **Programme** | **BCA (Honours)** |
| **Course Name** | **Fundamentals of Programming Using C** |
| **Type of Course** | **DSC** |
| **Course Code** | MG1DSCBCA100 |
| **Course Level** | **100** |
| **Course Summary** | This course covers fundamental concepts in computer programming, including algorithms, flowcharts, programming languages, control flow structures, arrays, and functions, emphasizing practical implementation through a series of hands-on exercises. Students will gain proficiency in solving problems using the C programming language. |

| **Semester** | 1 | | **Credits** | | 4 | **Total Hours** |
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| **Course Details** | Learning Approach | Lecture | Tutorial | Practical | Others | |
| | | 4 | 0 | 0 | 0 | 60 |
| **Pre-requisites, if any** | | | | | | |

## COURSE OUTCOMES (CO)

| CO No. | Expected Course Outcome | Learning Domains * | PO No |
|---|---|---|---|
| 1 | Demonstrate basic programming concepts. | U | 1 |
| 2 | Understand C Programming Basics such as Datatypes and Variables, Different types of operators. | U | 2 |
| 3 | Devise C programs using the concept of Decision statements and loop control statements. | An | 2 |
| 4 | Apply logic to use arrays and functions in C Programming Language. | A | 1 |
| *Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)* | | | |

## COURSE CONTENT

## Content for Classroom transactions (Units)

| Module | Units | Course description | Hrs | CO No. |
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| 1 | 1.1 | Problem Solving Life Cycle – Understanding the Problem Statement, Analysing the problem, Planning Program design using Hierarchy charts, Top-down approach, Bottom-up approach. Understanding basic Problem-Solving Tools: Algorithms: Definition & its attributes, Flowchart: Definition & its attributes, symbols, Statements: Input-Output, Decision-Making &Looping, Module representation | 6 | 1 |
| | 1.2 | **Introduction to Programming:** Computer program. Classification of computer languages: machine, assembly and high-level languages, Language translators (Assembler, Compiler, Interpreter), Linker, Testing and debugging, | 4 | 1 |
| | 1.3 | Types of errors- Syntax errors, Logical errors and Runtime errors. | 2 | 1 |
| 2 | 2.1 | C Character Set, Delimiters, Types of Tokens, C Keywords, Identifiers, Constants, Variables, Rules for defining variables, | 2 | 2 |
| | 2.2 | Data types, C data types, Declaring and initialization of variables, Type modifiers, Type conversion, Operators and Expressions- | 5 | 2 |
| | 2.3 | Properties of operators, Priority of operators, Comma and conditional operator, Arithmetic operators, Relational operators, | 3 | 2 |
| | 2.4 | Assignment operators and expressions, Logical Operators, Bitwise operators. | 4 | 2 |
| 3 | 3.1 | Input and Output in C – Formatted functions, unformatted functions, commonly used library functions, | 5 | 3 |
| | 3.2 | Decision Statements If, if-else, nested if-else, if-else-if ladder, break, continue, goto, switch, nested switch, switch case and nested if. | 6 | 3 |
| | 3.3 | Loop control- for loops, nested for loops, while loops, do while loop. | 6 | 3 |
| 4 | 4.1 | Array, initialization, array terminology, characteristics of an array, one dimensional array and operations, | 5 | 4 |

| | 4.2 | Two dimensional arrays and operations. Strings and standard functions, Introduction to pointers.<br><br>Basics of a function, function definition, return statement, | 6 | 4 |
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| | 4.3 | Types of functions, call by value and reference. Recursion - Rules for recursive function, Advantages and disadvantages of recursion. Storage class, Structure and union, Features of structures, Declaration and initialization of structures, typedef, enumerated data types, Union. | 6 | 4 |

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| **Teaching and Learning Approach** | **Classroom Procedure (Mode of transaction)**<br><br>• Use of ICT tools in conjunction with traditional classroom teaching methods<br>• Interactive sessions<br>• Class discussions |
| **Assessment Types** | **MODE OF ASSESSMENT**<br><br>**A. Continuous Comprehensive Assessment (CCA)**<br><br>**CCA for Theory: 30 Marks**<br><br>1. Written tests<br><br>2. Assignments<br><br>3. Quiz |
| | **B. Semester End Examination**<br><br>**ESE for Theory: Written Test (70 Marks, 2 Hrs)**<br><br>Part A: Very Short Answer Questions (Answer all) - (10*2=20 Marks)<br><br>Part B: Short Answer Questions (5 out of 7 Questions) - (5*6=30 Marks)<br><br>Part C: Essay Questions (2 out of 3 Questions) - (2*10=20 Marks) |

## REFERENCES

1. Balagurusamy, E. (2019), "Programming in ANSI C" (8th ed.), Tata McGraw Hill.

2. Hanly J. R. and Koffman E. B. (2007), "Problem Solving and Program Design in C" (7th ed.), Pearson Education.

## SUGGESTED READINGS

1. Gottfried, B. S. (2018). "Programming with C" (4th ed.). Schaum's Outline Series, TMH.

2. Pradeep K. Sinha and Priti Sinha (2004), "Computer Fundamentals -Concepts, Systems & Applications", 8th Edition, BPB Publications.

MGU-BCA (HONOURS)

Syllabus