DEPARTMENT OF COMPUTER SCIENCE

MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

CURRICULUM FOR CERTIFICATE COURSE

CERCS004: PROBLEM SOLVING USING C

OFFERED DURING THE ACADEMIC YEAR 2020-21

[APPROVED BY ACADEMIC COMMITTEE, MAMO COLLEGE]

MANASSERY, MUKKAM POST,
KOZHIKODE, KERALA, INDIA, 673 602.
EMAIL: MAMOCOLLEGE@GMAIL.COM

OFFICE: 0495-2297319
PRINCIPAL: 0495-2295121

www.mamocollege.org

CONTENTS

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com
Office: 0495-2297319
Principal: 0495-2295121
www.mamocollege.org

INSTITUTIONAL VISION, MISSION & OBJECTIVES 01

VISION: Build Scientifically Oriented, Intellectually Accomplished, Morally Upright and Socially Committed youth who can play a constructive role in Nation Building.

MISSION: Intellectual, social and economic empowerment of the youth in general and women, minorities, orphans and the destitute in particular by providing quality, value-based higher-education.

OBJECTIVES: Pursuit of Excellence, Harnessing technology, Thrust on value-based education, Nurturing Excellence and Moulding the youth for Nation Building

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com

Office: 0495-2297319
Principal: 0495-2295121

www.mamocollege.org

VISION, MISSION, OBJECTIVES & CORE VALUES OF THE DEPARTMENT 02

VISION: Equip the youth to harness the infinite potential of the ICT to be a part of the Nation Building process.

MISSION: Impart high quality, industry-oriented and value driven professional training to students to enable them to take up the challenging and diverse roles in the IT and Service industry.

OBJECTIVES: (a) Focus on core foundational computer science skills and emphasis on modern advances in computing. (b) Thrust on attaining the necessary technical, problem solving, ethical, communication, and collaboration skills to have successful careers through innovative and modern curriculum. (c) Special attention to provide industry-oriented quality training to impart skill requirements of the IT and Service industry. (d) Value-based training for maintaining Ethical Conscience. (e) Inculcate professionalism and global outlook through parallel soft-skill and value-added courses.

CORE VALUES: Innovation, Quality and Excellence, Industry-Oriented Skilling, Ethical Consciousness, Service Mindedness, Professionalism and Global Outlook.

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

B.Sc COMPUTER SCIENCE: PROGRAMME EDUCATIONAL OBJECTIVES (PEOs) 03

After 4 to 5 years of graduation, the career and professional accomplishments attained by the B.Sc Computer Science Graduates would reflect that the programme really prepared the graduates to deal with the real world, where they could apply and use the skills and knowledge they have learned to good use.

Specifically, the graduate would be:

PEO1: **Pursue any of the following three alternatives: (i) immediately take up a career in any area of Information Technology (IT) and Information Technology Enabled Services (ITES) and work productively as a successful computer professionals in diverse career paths including supportive and leadership roles on multidisciplinary teams, (ii) broaden the scope of the career path by pursuing higher studies and research in the field of Computer Science and (iii) go for taking up the challenge and spearheads start-ups by positively exploiting the diverse potentials of the IT & ITES industry..**

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

PEO2: Graduates will communicate effectively, recognize and incorporate societal needs and constraints in their professional endeavours, and practise their profession with high regard to legal and ethical responsibilities.

PEO3: Be original, creative, innovative and systematic in their all endeavours, including individual, collaborative and entrepreneurial ventures with meticulous strategic thinking, planning and execution.

PEO4: Have sufficient breadth of understanding to enable continued professional development and lifelong learning throughout their career.

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com
Office: 0495-2297319
Principal: 0495-2295121
www.mamocollege.org

B.Sc COMPUTER SCIENCE: PROGRAMME SPECIFIC OUTCOME (PSOs) 04

On successful completion of a Bachelor Degree in Computer Science, the graduates would be able to:

PSO1: **THEORETICAL SOUNDNESS IN COMPUTER SCIENCE: Students at the time of graduation will be able to apply fundamental knowledge of theoretical computer science and critically analyze problems to provide computer based solutions for engineering applications.**

PSO2: **HARDWARE AND SOFTWARE SYSTEMS: Students at the time of graduation will be able to design cost effective hardware/software systems and components for engineering/social applications using the knowledge of hardware and/or software architecture, programming and development.**

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com
Office: 0495-2297319
Principal: 0495-2295121
www.mamocollege.org

PSO3: **TECHNOLOGY: Students at the time of graduation will be able to apply appropriate technology to find solutions for complex problems.**

PSO4: **RESEARCH CAPABILITY: Students at the time of graduation will be able to apply domain knowledge and expertise for enhancing research capability to transform innovative ideas into reality.**

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com

Office: 0495-2297319
Principal: 0495-2295121

www.mamocollege.org

B.Sc COMPUTER SCIENCE: PROGRAMME OUTCOMES (POs) 05

The students graduating from B.Sc Computer Science Programme should be able to:

PO1: **SCIENTIFIC & COMPUTING KNOWLEDGE:** Apply knowledge of Computing and Mathematics to provide solutions to complex problems.

PO2: **PROBLEM ANALYSIS:** Identify, formulate, review research literature, and analyze complex real-life problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and computing.

PO3: **DESIGN/DEVELOPMENT OF SOLUTIONS:** Design solutions for complex real-life problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: **CONDUCT INVESTIGATIONS OF COMPLEX PROBLEMS:** Use research-based knowledge and

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: **MODERN TOOL USAGE:** Create, select, and apply appropriate techniques, resources, and modern computing and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: **THE COMPUTING PROFESSION AND SOCIETY:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practice.

PO7: **ENVIRONMENT AND SUSTAINABILITY:** Understand the impact of the professional computing solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: **ETHICS:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the computing practice.

PO9: **INDIVIDUAL AND TEAM WORK:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

PO10: **COMMUNICATION: Communicate effectively on complex computing activities with the computing community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.**

PO11: **PROJECT MANAGEMENT AND FINANCE: Demonstrate knowledge and understanding of the computing and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.**

PO12: **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 change..**

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

CERTIFICATE COURSE

CERCS004: PROBLEM SOLVING USING C 06

COURSE CURRICULUM

Course Name	Problem Solving Using C
Course Code	CERCS004
Year	2020-21
Course Designer	Mr. Firoz V.M
Couse Duration	30 Hrs
Course Schedule	June to September
Maximum Students Intake	60 Students

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com

Office: 0495-2297319
Principal: 0495-2295121

www.mamocollege.org

1. COURSE LEVEL

Foundational, skill-oriented certificate programme.

2. PREREQUISITE

To ensure success, students should be familiar with using personal computers, and should have experience using a keyboard and mouse. No prior knowledge of Programming language is required.

3. COURSE INTAKE & ADMISSION

Maximum 60 students will be given admission to the course based on First-Come-First-Serve basis. All the students of the MAMO College are eligible for free enrolment for the course. The enrolment notification will be issued for the course well in advance of the commencement of the course.

4. COURSE COORDINATOR

Ms. Beena Cherian, Department of Computer Science

5. COURSE PREAMBLE

C is a general-purpose programming language that is extremely popular, simple and flexible. It is machine-independent, structured programming language which is used extensively in various applications.C was the basic language to write everything from operating systems (Windows and many others) to complex programs like the Oracle database, Git, Python interpreter and more.It is said that 'C' is a god's programming language. One can say, C is a base for the programming. If you know 'C,' you can easily grasp the knowledge of the other programming languages that uses the concept of 'C'. It is essential to have a background in computer memory mechanisms because it is an important aspect when dealing with the C programming language.

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

6. DURATION

Total Duration: 30 Hrs. [Contact Hrs. 8 Hrs. Lab Hours: 8 Hrs. Course Woks: 7 and Assessment Works: 7]

7. CURRICULUM FOCUS

Enhance the employability of the learners through curriculum enrichment for additional skill development.

8. COURSE OBJECTIVES

Learners are expected to

(a) Write basic C programming for real time problem solution.

(b) Acquire programming skills that enhance the employability of the learners

9. SKILL EXPECTED

On the successful completion of the course, learners will be able to:

(a) Apply problem solving skills to real-life problems.

(b) Develop problem analysing and problem-solving skills.

10. COURSE OUTCOMES

Upon the successful completion of the course, learners will be able to:

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

CO No	Course Outcome(CO)	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Demonstrate an understanding of computer programming language concepts.	Understand
CO2	Able to develop C programs on windows platform	Apply
CO3	Ability to design and develop Computer programs, analyzes, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage	Analyze
CO4	Develop new c programsthat is suitable for a given case.	Create

11. MAPPING OF COs WITH PSOs AND POs

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	1	1	2	1	1	1	1	1	2	3	1	2	1	1	2	1
CO2	1	1	2	1	1	1	1	1	2	3	1	2	1	1	2	1
CO3	1	1	2	1	1	1	1	1	2	3	1	2	1	1	2	1
CO4	1	1	2	1	1	1	1	1	2	3	1	2	1	1	2	1
AVG	1	1	2	1	1	1	1	1	2	3	1	2	1	1	2	1

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

12. MODULE-WISE COURSE CONTENTS

MODULE 1: INTRODUCTION TO C LANGUAGE

MODULE DURATION: 15 Hrs. [Contact Hrs. 6 Hrs. Lab Hours: 2 Hrs., Course Woks: 3 and Assessment Works: 4]

MODULE CONTENT: History and Features of C, Importance of C, About Procedural Language, Compiler and interpreter, The Structure of a C Program, Writing C Programs, Building an Executable Version of a C Program, Data Type, Variable, Operators, Control Statement, Reading/Writing Characters, Formatted input/output Function, Control statements.

MODULE OUTCOME: On successful completion of the module learners will understand basics of c programming language. Learning this module will help you to write small c programs t solve real-life problems.

MODULE 2: FEATURES IN C

MODULE DURATION: 15 Hrs. [Contact Hrs. 2 Hrs., Lab Hours: 6 Hrs., Course Woks: 4 and Assessment Works: 3]

MODULE CONTENT: Arrays in C- One dimensional, two dimensional, multi-dimensional, and dynamic array. String handling, Functions in C.

MODULE OUTCOME: On successful completion of the module learners will be able write more complex C programs to solve real-life problems.

REFERENCES:

1. E. Balagurusamy, *Programming in ANSI C.*
2. Yashavant P. Kanetkar, *Let us C.*
3. T. Jeyapoovan, A *First Course in Programming with C.*

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

ADDITIONAL REFERENCES & STUDY MATERIALS:

4. *C Programming* course in COURSERA: https://www.coursera.org/courses?query=c%20programming

13. DELIVERY MODE

The course employs multi-mode delivery mechanism including contact lecture, online MOOC courses from NPTEL, Online and offline course works and Laboratory sessions.

14. DELIVERY SCHEDULE

June to September.

15. DETAILED COURSE DELIVERY PLAN

Hour	Delivery Mode and Activity	Topics to be Covered
1	Contact Hour - 1: Classroom Discussion	Introducing the Course, History and Features of C
2	Lab Hour - 1	Interacting with IDE of C language
3	Contact Hour - 2: Classroom Demonstration	The Structure of a C Program, Writing C Programs,
4	Contact Hour - 3: Classroom Demonstration	Building an Executable Version of a C Program
5	Contact Hour - 4: Classroom Demonstration	Understanding Data Type, Variable, Operators
6	Contact Hour - 5: Classroom Demonstration	Working with Control Statement, Reading/Writing Characters
7	Contact Hour - 6: Classroom Demonstration	Formatted input/output Function
8	Lab Hour - 2	Coding and running C program

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

Hour	Delivery Mode and Activity	Topics to be Covered
9	Course Work – 1: Course Assignment	Course Assignment to Create a C program with Specific input and expected output.
10	Course Work – 2: Course Assignment	Course Assignment to Create a C program with Specific input and expected output.
11	Assessment Hour - 1	Course Assignment to Create a C program with Specific input and expected output.
12	Course Work – 3: Course Assignment	Course Assignment to Create a C program with Specific input and expected output.
13	Assessment Hour - 2	Course Assignment to Create a C program with Specific input and expected output.
14	Contact Hour - 7: Classroom Demonstration	Working with One dimensional, two dimensional arrays
15	Contact Hour - 8: Classroom Demonstration	Working with multi-dimensional, and dynamic array.
16	Lab Hour - 3	Create a C program to understand control statements
17	Lab Hour - 4	Create a C program to understand loops
18	Lab Hour - 5	Create a C program to understand function
19	Course Work – 4: Course Assignment	Course Assignment to Create a C program with Specific input and expected output.

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

Hour	Delivery Mode and Activity	Topics to be Covered
20	Course Work – 5: Course Assignment	Course Assignment to Create a C program with Specific input and expected output.
21	Lab Hour - 6	Create a C program to understand control statements
22	Lab Hour - 7	Create a C program to understand loop statements
23	Lab Hour - 8	Working with Functions
24	Assessment Hour - 3	Course Assignment to Create a C program with Specific input and expected output.
25	Assessment Hour - 4	Course Assignment to Create a spreadsheet with Specific Requirements
26	Assessment Hour - 5	Course Assignment to Create a spreadsheet with Specific Requirements
27	Course Work – 6: Course Assignment	Course Assignment to Create a spreadsheet with Specific Requirements
28	Course Work – 7: Course Assignment	Course Assignment to Create a spreadsheet with Specific Requirements
29	Assessment Hour - 6	Course End Assessment
30	Assessment Hour - 7	Course End Assessment

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

16. ASSESSMENT COMPONENTS

Total Marks: 100

CLASSROOM AND GROUP PARTICIPATION: **20 Marks.** This component aims at testing the course content understanding and the reflection skills and their attainment levels.

COURSE WORK: 30 Marks. This component aims at testing the skill attainment levels of the learners in analysing and implementing the real-world problem.

MID-COURSE ASSIGNMENT: **20 Marks.** This component aims at testing the module-wise attainment levels of the course objectives and course outcome and module outcomes.

END-COURSE ASSESSMENT: **30 Marks.** This component aims at testing overall attainment levels of the course with respect to course objectives, course outcome and module outcomes.

17. COURSE EVALUATION & GRADING

The course evaluation is done/coordinated entirely by the course coordinator. The following 10-point Indirect Grading System is used for awarding grades to students:

Percentage of Mark	Letter Grade	Interpretation	Class
95 and above	**O**	**Outstanding**	First Class with Distinction
85 to below 95	A+	Excellent	First Class with Distinction
75 to below 85	A	Very good	First Class with Distinction
65 to below 75	B+	Good	First Class
55 to below 65	B	Satisfactory	First Class
45 to below 55	C	Average	Second Class

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602

35 to below 45	P	Pass	Third Class
Below 35	F	Failure	Fail
Incomplete	I	Incomplete	Fail
Absent	Ab	Absent	Fail

The grade is awarded by the course-coordinator by considering the overall performance of the learner in all the assessment component of the course.

18. GRIEVANCE REDRESSAL

The grievances, if any, can be submitted to the Head of the Department for its redressal. Those grievances that cannot be redressed by HoD can be forwarded to Academic Council of the College for final decision on the matter.

19. ISSUANCE OF CERTIFICATES

The Course Completion Certificate will be issued to all the successful candidates showing the Total Marks and Grade Obtained.

Muhammed Abdurahiman Memorial Orphanage College ★ ACADEMIC COMMITTEE

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602