



**DEPARTMENT OF PHYSICS**  
**MUHAMMED ABDURAHIMAN MEMORIAL**  
**ORPHANAGE (MAMO) COLLEGE**

[Govt. Aided First Grade College & Affiliated to University of Calicut.  
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**CURRICULUM FOR CERTIFICATE**  
**COURSE IN**  
**CERPH003: BASICS OF MATLAB**

**OFFERED DURING THE**  
**ACADEMIC YEAR 2017-18**  
**[APPROVED BY ACADEMIC COMMITTEE, MAMO COLLEGE]**



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



OFFICE: 0495-2297319  
PRINCIPAL: 0495-2295121



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## DEPARTMENT OF PHYSICS

### CURRICULUM FOR CERTIFICATE COURSE - CERPH003

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## INSTITUTIONAL VISION, MISSION & OBJECTIVES 01



VISION

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



MISSION

**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

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



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



VISION

**VISION:** To build an effective and efficient scenario for the conceptually rich youth to create and revolutionize towards the overall integrity and Development of our Nation.



MISSION

**MISSION:** To provide an effective environment to enhance the scientific temperament and leadership Quality through Rationalism, critical and logic thinking in the students and thereby promoting them to be a socially committed, employable and responsible youth.



**OBJECTIVES:** (a) Emphasize the role of Physics in life. (b) Develop the ability to conduct, observe, analyzes and report an experiment and to deal with physical and mathematical models. (c) Improve the fundamental concepts and advanced techniques of Physics. (d) Enhance intellectual, computational, experimental, communication and analytical skills of the students. (e) Provide the students with the modern techniques in physics.



VALUES

**CORE VALUES:** Innovation, Quality & Excellence, Integrity, Ethical Conscience, Fairness & Justice, Service Mindedness, Professionalism, Global Outlook, Honesty and Discipline & Accountability.



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## B.Sc PHYSICS: PROGRAMME EDUCATIONAL OBJECTIVES [PEOs] 03

After 4 to 5 years of graduation, the career and professional accomplishments attained by the Physics 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 able to:



**PEO1: COMPETENCY SKILLS:** To develop strong student competencies and its applications in a technology – rich, interactive environment.



**PEO2: ADAPTABILITY TO THE CHANGING ENVIRONMENTS:** 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.



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**PEO3: ENTHUSIASM IN RESEARCH:** To develop strong student skills in research, and interpretation of complex information.



**PEO4: SUSTAINABLE EXCELLENCE AND GROWTH IN THE CAREER:** Have sufficient breadth of understanding to enable continued professional development and lifelong learning throughout their career..



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## B.Sc PHYSICS: PROGRAMME SPECIFIC OUTCOME [PSOs] 04

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



**PSO1:** Introduce advanced techniques and ideas required in developing a suitable career in life.



**PSO2:** Understand and apply principles of Physics for understanding the scientific phenomenon in the recent research realms.



**PSO3:** Developing research oriented skills and to create an awareness on the impact of Physics on the society and development outside the scientific community.



**PSO4:** Enhance the ability of the students to use Mathematical and Statistical models in solving various problems in the course of study and also to make aware and handle various sophisticated instruments/equipment.



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# B.Sc PHYSICS: PROGRAMME OUTCOMES [POs] 05

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



**PO1: SCIENTIFIC TEMPER & KNOWLEDGE:** Apply knowledge of physics and its branches to provide solutions to complex problems.



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



**PO3: ANALYTIC SOLUTIONS:** Design practical solutions for complex real-life problems through proper case analysis 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.



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**PO4: CRITICAL / LOGICAL THINKING:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.



**PO5: ADAPTABILITY THROUGH TECHNOLOGY:** 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 RATIONALISM 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 & HONESTY:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the computing practice.



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



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**PO10: COMMUNICATION:** Communicate effectively on complex computing activities with the team members and with society at large, such as, being able to comprehend and demonstrate in simple manner, and give and receive clear instructions.



**PO11: PROJECT MANAGEMENT AND FINANCE:** Demonstrate knowledge and understanding of the scientific and reasoning 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.



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## CERTIFICATE COURSE

# CERPH003: BASICS OF MATLAB 06

## COURSE CURRICULUM

Course Name	Basics of MATLAB
Course Code	CERPH003
Year	2017-18
Course Designer	Mr. Haroon Hussain Moidu
Course Duration	30 Hrs
Course Schedule	June to September
Maximum Students Intake	60 Students



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#### 1. COURSE LEVEL

Foundational, skill-oriented certificate programme.

#### 2. PREREQUISITE

Higher Secondary level knowledge in Physics and Mathematics.

#### 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

Dr. Daughty John, Assistant Professor, Department of Physics..

#### 5. COURSE PREAMBLE

Learning computational tools in the need of the day of all of us, especially science students. Solving the already solved and studied areas in science by pen and paper method is old school now. The best computational tool to start with for any science student is MATLAB. As the name suggest, it provides us tools to do different mathematical calculations.

#### 6. DURATION

Total Duration: 30 Hrs. [Contact Class. 5 Hrs. Lab Hours 15Hrs, Course Works: 6 Hrs and Assessment Works: 6 Hrs]



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## 7. CURRICULUM FOCUS

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

## 8. COURSE OBJECTIVES

Learners are expected to

- Theoretical knowledge on classic physics problems
- Acquire ability to use MATLAB to solve them.

## 9. SKILL EXPECTED

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

- Use MATLAB in solving mathematical equations
- Understand classic physics problems.

## 10. COURSE OUTCOMES

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

CO No	Course Outcome(CO)	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Use MATLAB to solve mathematical equations	Understand
CO2	Study classic physics problems like LCR circuit and Harmonic Oscillator	Understand
CO3	Draw graphs of the results	Analyse



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CO No	Course Outcome(CO)	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO4	Prepare reports of the study	Evaluate

## 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	2	3	3	3	2	2	2	1	1	2	1	2	3	2	3	2
CO2	2	3	3	3	3	2	2	1	1	2	1	2	3	2	3	3
CO3	2	3	3	3	3	2	2	1	1	2	1	2	3	2	3	2
CO4	2	3	3	3	3	2	2	2	1	2	1	2	3	2	3	3
AVG	2	3	3	3	2.5	2	2	1.5	1	2	1	2	3	2	3	2.5

## 12. MODULE-WISE COURSE CONTENTS

### MODULE 1

**MODULE DURATION:** 2 Hrs. [Lab Hrs: 1, Assessment Works: 1]

**MODULE CONTENT:** What Is MATLAB? The MATLAB System, MATLAB online help.

**MODULE OUTCOME:** On successful completion of the module learners can familiarize with the basics of the MATLAB

### MODULE 2

**MODULE DURATION:** 2 Hrs. [Lab Hours: 1, Assessment Works: 1]



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**MODULE CONTENT:** MATLAB Documentation, Starting and Quitting MATLAB, MATLAB Desktop

**MODULE OUTCOME:** On successful completion of the module, learners will be able to know how to install and setup MATLAB in ones machine

#### MODULE 3

**MODULE DURATION:** 8 Hrs. [Contact Hrs : 2, Lab Hours: 3 Hrs., Course Works:2 and Assessment Works: 1]

**MODULE CONTENT:** Matrices and Arrays, sum, transpose and diag, Subscripts, The Colon Operator, Expressions: Variables, Numbers, Operators and Functions, Examples of Expressions

**MODULE OUTCOME:** On successful completion of the module learners will be able to know more about matrices, arrays and other expressions

#### MODULE 4

**MODULE DURATION:** 8 Hrs. [Contact Hrs. 2, Lab Hours: 3 Hrs., Course Works:2 and Assessment Works: 1]

**MODULE CONTENT:** Graphics, Overview of MATLAB Plotting, Editing Plots, Examples — Using MATLAB Plotting Tools, Preparing Graphs for Presentation, Basic Plotting Functions.

**MODULE OUTCOME:** On successful completion of the module learners will be able to know more about plotting in MATLAB

#### MODULE 5

**MODULE DURATION:** 10 Hrs. [Contact Hrs. 2, Lab Hours: 4, Course Works:2 and Assessment Works: 2]



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**MODULE CONTENT:** Solving Simple harmonic oscillator and LCR circuits.  
Plotting the solutions

**MODULE OUTCOME:** On successful completion of the module learners will be able to know more about classic physics problems and how to use MATLAB to solve them

### REFERENCES

1. *Getting Started with MATLAB 7*, The Math Works
2. Peter Issa Kattan, *MATLAB for Beginners: A Gentle Approach*.

### ADDITIONAL REFERENCES & STUDY MATERIALS:

3. Rudra Pratap, *Getting started with MATLAB*.

## 13. DELIVERY MODE

The course employs multi-mode delivery mechanism including contact lecture, online videos, and Online and offline course works.

## 14. DELIVERY SCHEDULE

June to September.

## 15. DETAILED COURSE DELIVERY PLAN

Hour	Delivery Mode and Activity	Topics to be Covered
1	Lab session 1	What Is MATLAB? The MATLAB System, MATLAB online help
2	Assessment 1	Assignment on Installation of MATLAB



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Hour	Delivery Mode and Activity	Topics to be Covered
3	Lab session 2	MATLAB Documentation, Starting and Quitting MATLAB, MATLAB Desktop
4	Assessment 2	Assignment on using MATLAB Desktop
5	Contact Lecture 1	Matrices and Arrays, sum, transpose and diag, Subscripts, The Colon Operator,
6	Lab session 3	Matrices and Arrays, sum, transpose and diag, Subscripts, The Colon Operator
7	Contact Lecture 2	Expressions: Variables, Numbers, Operators and Functions, Examples of Expressions
8	Lab session 4	Expressions: Variables, Numbers, Operators and Functions
9	Lab session 5	Examples of Expressions
10	Course work 1	Matrices and Arrays
11	Course work 2	Expressions:
12	Assessment 3	Assignment on Matrices and Arrays, Expressions
13	Contact Lecture 3	Graphics, Overview of MATLAB Plotting, Editing Plots,
14	Lab session 6	Graphics, Overview of MATLAB Plotting, Editing Plots,
15	Contact Lecture 4	Examples — Using MATLAB Plotting Tools, Preparing Graphs for Presentation, Basic Plotting Functions



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Hour	Delivery Mode and Activity	Topics to be Covered
16	Lab session 7	Examples — Using MATLAB Plotting Tools,
17	Lab session 8	Preparing Graphs for Presentation, Basic Plotting Functions
18	Course work 3	Homework on plotting tools
19	Course work 4	Homework on plotting functions
20	Assessment 4	Multiple choice/ descriptive exam
21	Contact Lecture 5	Solving Simple harmonic oscillator
22	Lab session 9	Program for Solving Simple harmonic oscillator
23	Contact Lecture 6	Solving LCR circuits. Plotting the solutions
24	Lab session 10	Program for Solving LCR circuits
25	Lab session 11	Plotting solution of SHM
26	Lab session 12	Plotting solution of LCR circuits
27	Course work 5	Homework on programs of other examples
28	Course work 6	Homework on plotting of other examples
29	Assessment 5	Multiple choice examination
30	Assessment 6	Descriptive examination

## 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.



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



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Principal: 0495-2295121



[www.mamocollege.org](http://www.mamocollege.org)

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



# MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

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Re-Accredited by NAAC with A Grade]

## DEPARTMENT OF PHYSICS

### CURRICULUM FOR CERTIFICATE COURSE - CERPH003

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



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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.



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