DEPARTMENT OF PHYSICS

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 IN

CERPH002: COMMUNICATION ELECTRONICS

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

www.mamocollege.org

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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.

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

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: 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.

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

CERPH002: COMMUNICATION ELECTRONICS 06

COURSE CURRICULUM

Course Name	Communication Electronics
Course Code	CERPH002
Year	2017-18
Course Designer	Ms. Rukkiyya V. P.
Couse Duration	30 Hrs
Course Schedule	June to September
Maximum Students Intake	60 Students

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CURRICULUM FOR CERTIFICATE COURSE

1. COURSE LEVEL

Foundational, skill-oriented certificate programme.

2. PREREQUISITE

Plus two with physics as one of the subjects.

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. Rukkiyya V. P, Assistant Professor, Department of Physics..

5. COURSE PREAMBLE

Moving from paper to electronic communications can actually help our business connect easier, while saving time and money. In signal processing, signal is a function that conveys information about a phenomenon. In electronics and telecommunications, it refers to any time varying voltage, current or electromagnetic wave that carries information. In a communication system, a transmitter encodes a message to create a signal, which is carried to a receiver by the communications channel. This course intends to include the basic idea of fundamentals of the A/D and D/A conversion, receivers, transmitters and widely used techniques for the wave propagation and communication.

6. DURATION

Total Duration: 30 Hrs. [Contact Hrs. 20Hrs, Course Woks: 6 and Assessment

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Works: 4]

7. CURRICULUM FOCUS

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

8. COURSE OBJECTIVES

Learners are expected to

(a) Learning of principles behind the communication electronics.

(b) Knowledge of applications of communication electronics in everyday life.

9. SKILL EXPECTED

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

(a) To notify the learner about the fundamentals of modulation.

(b) To know about the applications of receivers and transmitters.

(c) To have knowledge about radiations and antennas.

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	Study the fundamentals of the A/D and D/A conversion and different types of modulations	Understand

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CO No	Course Outcome(CO)	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO2	Applications of receivers and transmitters in different fields.	Understand
CO3	Study the fundamentals of the A/D and D/A conversion and different types of modulations	Understand

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	3	0	1	1	1	2	1	0	0	2	1	2	0	2	1	1
CO2	3	0	2	1	2	2	1	0	1	3	2	2	2	3	2	2
CO3	2	0	3	2	3	2	1	0	1	3	2	2	3	3	3	2
AVG	**3**	**0.7**	**1**	**2**	**3**	**1.3**	**2.3**	**0.3**	**1**	**1**	**1.6**	**2.3**	**2.6**	**2.3**	**1.3**	**1.3**

12. MODULE-WISE COURSE CONTENTS

MODULE 1: SIGNALS AND SYSTEMS

MODULE DURATION: 7 Hrs. [Contact Hrs. 5 Hrs. Course Works: 1 and Assessment Works: 1]

MODULE CONTENT: Classifications of signals, concept of frequency in continuous - time and discrete –time signals. Theory of A/D and D/A conversion, Sampling of Analogue signals, sampling Theorem .modulation AM, FM, PM.

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MODULE OUTCOME: On successful completion of the module learners can familiarize with the fundamentals of the A/D and D/A conversion and different types of modulations.

MODULE 2: RECEIVERS

MODULE DURATION: 14 Hrs. [Contact Hrs. 9 Hrs. Course Works: 3 and Assessment Works: 2]

MODULE CONTENT: AM receivers – Automatic gain control – Communications receivers – FM receivers – Single and independent side band receivers. Transmitters – AM transmitters – FM transmitters – Television transmitters radio systems –VHF/UHF systems – Microwave systems – Satellite communications.

MODULE OUTCOME: On successful completion of the module learners will be able to know more about different types of receivers and some applications.

MODULE 3: RADIATION AND ANTENNAS

MODULE DURATION: 9 Hrs. [Contact Hrs. 6 Hrs.., Course Works: 2 and Assessment Works: 1]

MODULE CONTENT: Potential functions and the EM field – Radiation from an oscillating dipole –Power radiated by a current element–- Directivity – Gain and effective aperture– Frequency independent antennae —. Propagation of radio waves - Ground waves, Sky wave propagation, Space waves, Troposphere scatter propagation, Extra-terrestrial communication. Ionosphere –Reflection and refraction of waves by the ionosphere – Attenuation

MODULE OUTCOME: On successful completion of the module learners will be able to know more about antennas and propagation of waves.

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REFERENCES

1. Roddy and Coolen, J, *Electronic Communications*, (PHI, 1986). Chapters 7, 8, 9, 10, 11, 12, 18, 19
2. Kennedy, G. and Davis, B., *Electronic Communication Systems*, 4th Edition, McGraw Hill, 1992. Chapter 6 & 8.
3. Jordan E. C. and Balmain, K. G., *Electromagnetic Waves and Radiating Systems*, (PHI, 1979). Chapters 10, 11, 15 and 17.

ADDITIONAL REFERENCES & STUDY MATERIALS:

4. Proakis and Manolakis, *Digital Signal Processing*, Prentice Hall of India (1997)
5. Jacob Millman, Christos C. Halkias, Int*egrated Electronics Analog and Digital & System*.
6. Martin Plonus, *Electronics and Communications for Scientists and Engineers*.

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.

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15. DETAILED COURSE DELIVERY PLAN

Hour	Delivery Mode and Activity	Topics to be Covered
1	Contact Lecture 1	Classification of Signals
2	Contact Lecture 2	Time signals
3	Contact Lecture 3	Theory of A/D and D/A conversion
4	Contact Lecture 4	Sampling of Analogue Signal
5	Contact Lecture 5	Different types of Modulation
6	Course work 1	Developing a electronic Circuit for modulation
7	Assessment 1	Assignment on Modern techniques used Pulse code modulation
8	Contact Lecture 6	AM Receivers
9	Contact Lecture 7	Communication receivers
10	Contact Lecture 8	Transmitters
11	Contact Lecture 9	AM & FM Transmitters
12	Course work 2	Data collection of Different transmitters used
13	Assessment 2	Assignment on difference between AM and FM Receivers
14	Contact Lecture 10	Television transmitters
15	Contact Lecture 11	Radio Systems
16	Contact Lecture 12	VHF/UHF system
17	Contact Lecture 13	Microwave system
18	Contact Lecture 14	Satellite communication
19	Course work 3	Discussion recent development in radio system
20	Course work 4	Application Of Satellite Communication

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Hour	Delivery Mode and Activity	Topics to be Covered
21	Assessment 4	Multiple choice/ descriptive exam
22	Contact Hour 15	Basic Theory of radiation
23	Contact Lecture 16	Radiation of an oscillating dipole
24	Contact Lecture 17	Directivity
25	Course work 5	Review on the lectures using e resources
26	Contact Hour 18	Propagation of Waves
27	Contact Hour 19	Extra-terrestrial Communication
28	Contact Hour 20	Attenuation
29	Course work 6	Winding up the course
30	Assessment 5	Multiple choice/ descriptive exam

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.

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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

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.

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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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