

CHOICE BASED CREDIT SYSTEM

(Applicable to all students registering from the academic year 2021-22 onwards)

Department of Electrical and Electronics Engineering

B.E (Electrical and Electronics Engineering – Marine)

Curriculum

ACADEMY OF MARITIME EDUCATION AND TRAINING (AMET)

DECLARED AS DEEMED TO BE UNIVERSITY

135, EAST COAST ROAD

KANATHUR, CHENNAI-603112



AMET
ACADEMY OF MARITIME EDUCATION AND TRAINING
DEEMED TO BE UNIVERSITY
(Under Section 3 of UGC Act 1956)

Vision and Mission of the Institution

Vision

To sustain identity as a World Class Leader in Maritime Education and empower learners with wholesome knowledge through progressive innovation in training, research and development which will render students a unique learning experience and a transformation impact on the Global Society.

Mission

AMET will strive continuously to

- ❖ Impart value-based higher education and technical knowledge with uncompromising strides of an outstanding quality.
- ❖ Emerge as a Centre of Excellence inculcating skill development in recent technologies in accordance with industrial trends.
- ❖ Create World class research capabilities on par with the finest in the world and broaden student's horizons beyond classroom education.
- ❖ Nurture talent and entrepreneurship to enable all round personality development among students.
- ❖ Empower students across socio economic strata
- ❖ Make a positive difference to society through technical education.

Vision and Mission of the Department

Vision

To emerge as a Centre for higher learning and research through development of highly competent, innovative and world class Marine Electrical and Electronics Engineers while remaining sensitive to ethical, societal and environmental issues.

Mission

- ❖ To impart quality education in order to produce highly innovative, socio- economically conscious Marine Electrical and Electronics Engineers.
- ❖ To provide knowledge and skills, that is essential to meet the local and global demands in Marine Electrical and Electronics Engineering.
- ❖ To upgrade student's technical knowledge through industry interaction activities.
- ❖ To foster strong ethics, positive attitude and transform the Department into Centre of Excellence by promoting world class research and development to meet the challenging needs of society.
- ❖ To motivate and guide students for developing entrepreneurship or pursue higher education and train them for overall personality development.

Program Educational Objectives (PEOs)

Program Educational Objectives (PEOs) are established by means of a consultation process. PEOs are specific statements outlining the career and educational milestones that the students will accomplish within three to five years of the graduation year.

The Electrical and Electronics Engineering –Marine Program graduates will

PEO1:

Have a successful career in Marine or other related Electrical and Electronics Engineering fields or pursue higher education and research in multidisciplinary area.

PEO2:

Apply Engineering fundamentals, technical knowledge, skills and modern tools to solve real world Electrical Engineering problems in Maritime industries.

PEO3:

Adapt to any environment and practice the ethics of their profession, consistent with a sense of social responsibility

PEO4:

Exhibit the skills by updating the breadth of knowledge in the life-long learning process to meet the global challenges.

PROGRAM OUTCOMES (PO's)

PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem Analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	Design/Development of solutions: Design solutions for complex engineering 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.
PO 4	Conduct investigations of complex problems: 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.
PO 5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	The Engineer 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 engineering practice.
PO 7	Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10	Communication: Communicate effectively on complex engineering activities with the engineering 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
PO 11	Project Management and Finance: Demonstrate knowledge and understanding of the engineering 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
PO 12	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.

PROGRAM SPECIFIC OUTCOMES (PSO'S)

PSO 1	Apply the knowledge of Electrical Engineering, investigate and solve the complex Marine Electrical Engineering problems to meet the specified needs with appropriate considerations for the society.
PSO 2	Develop solutions for complex Engineering problems in the broad field of power electronics and drives, power systems, high voltage Engineering and Marine Engineering and control.
PSO 3	Analyze, design and integrate Electrical systems in on board ships and apply modern tools and techniques in marine industries and create passion for life-long learning and research in advanced fields.

PEO / PO Mapping:

PROGRAM EDUCATIONAL OBJECTIVES	PROGRAM OUTCOMES											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PEO01	√	√	√	√	√	√		√	√	√	√	√
PEO02	√	√	√	√	√	√		√	√		√	
PEO03	√	√	√	√		√	√	√	√	√	√	
PEO04	√	√	√	√		√	√	√			√	√



**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
CURRICULUM FOR B.E. (Electrical and Electronics Engineering (Marine))**

ACADEMIC YEAR - 2021-2022

SEMESTER I

S. No	Course Code	Category	Course Title	Contact Hours	L	T	P	C
THEORY								
1	UELEC01	Humanities and Social Science including Management Courses	Technical English	2	2	0	0	2
2	UEPHC01	Basic Science Course	Engineering Physics-I	3	3	0	0	3
3	UEMTC01	Basic Science Course	Engineering Mathematics-I	4	3	1	0	4
4	UEEEEC01	Engineering Science Course	Basic Electrical Engineering	4	3	1	0	4
5	UEMDC01	Mandatory Course 1	Universal Human Values I - Induction program	3 weeks	-	-	-	-
PRACTICAL								
6	UELECPA	Humanities and Social Science including Management Courses	Communication Skills Laboratory - I	2	0	0	2	1
7	UEEECPA	Engineering Science Course	Basic Electrical Engineering Laboratory	2	0	0	2	1
8	UEMCCPA	Engineering Science Course	Engineering Graphics	5	1	0	4	3
9	UEWSCPA	Engineering Science Course	Work Shop Practices	4	0	0	4	2
TOTAL				26	12	2	12	20

*L- Lecture; T-Tutorial; P-Practical; C-Credit



SEMESTER II

S. No	Course Code	Category	Course Title	Contact Hours	L	T	P	C
THEORY								
1.	UECHC01	Basic Science Course	Engineering Chemistry	4	4	0	0	4
2.	UEPHC02	Basic Science Course	Engineering Physics-II	2	2	0	0	2
3.	UEMTC02	Basic Science Course	Engineering Mathematics-II	4	3	1	0	4
4.	UEITC01	Engineering Science Course	Python for problem solving	3	3	0	0	3
5	UEMDC02	Mandatory Course 2	Environmental Sciences	2	2	0	0	0
6	UEMDC03	Mandatory Course 3	Gender sensitivity	2	2	0	0	0
PRACTICAL								
7	UELECPB	Humanities and Social Science including Management Courses	Communication Skills Laboratory - II	2	0	0	2	1
8	UEPHCPA	Basic Science Course	Engineering Physics Laboratory	2	0	0	2	1
9	UECHCPA	Basic Science Course	Engineering Chemistry Laboratory	2	0	0	2	1
10	UEITCPA	Engineering Science Course	Python Programming Lab	2	0	0	2	1
TOTAL				25	16	1	8	17



SEMESTER III

S. No	Course Code	Category	Course Title	Contact Hours	L	T	P	C
THEORY								
1.	UEMTC03	Basic Science Course	Engineering Mathematics-III	4	3	1	0	4
2.	UEMCC01	Engineering Science Course	Engineering Mechanics	3	3	0	0	3
3.	UEEE301	Professional Core Course 1	Electric Circuit Analysis	3	3	0	0	3
4.	UEEE302	Professional Core Course 2	Electromagnetic Theory	3	3	0	0	3
5.	UEEE303	Professional Core Course 3	Electrical Machines-I	3	3	0	0	3
6.	UEEE304	Engineering Science Course	Electron Devices and Circuits	3	3	0	0	3
7	UEMDC04	Mandatory Course 4	Constitution of India	2	-	-	-	-
8	UEVCC01	Employment Opportunity Course	Value Added Training Program-I	2	-	-	2	-
9	UEVCC02	Industrial Visit	Industrial Visit-I	-	-	-	-	-
PRACTICAL								
10	UEEE3PA	Professional Lab Course 1	Electrical Machines-I Laboratory	2	0	0	2	1
11	UEEE3PB	Professional Lab Course 2	Electric Circuit Analysis Laboratory	2	0	0	2	1
12	UEEE3PC	Engineering Science Course	Electrical Workshop Practices	2	0	0	2	1
13	UELECPC	Humanities and Social Science including Management Courses	Interpersonal Communication	2	0	0	2	1
TOTAL				31	18	1	10	23



SEMESTER IV

S. No	Course Code	Category	Course Title	Contact Hours	L	T	P	C
THEORY								
1.	UEMTC04	Basic Science Course	Mathematical foundation for Data science and AI	2	2	0	0	2
2	UEMCC02	Engineering Science Course	Thermodynamics	3	3	0	0	3
3	UEMDC05	Humanities and Social Science including Management Courses	Universal Human Values 2- Understanding Harmony	3	3	0	0	3
4	UEEE401	Professional Core Course 4	Linear and Digital IC Applications	3	3	0	0	3
5.	UDEE402	Professional Core Course 5	Electrical Machines -II	3	3	0	0	3
6	UDEE403	Professional Core Course 6	Transmission and Distribution	3	3	0	0	3
7		Open Elective Course 1	OEC 1	3	3	0	0	3
8	UEMDC05	Mandatory Course 5	Essence of Indian Knowledge Tradition	2	2	0	0	0
9	UEVCC03	Employment Opportunity Course	Value Added Training Program-II	2	0	0	2	0
10	UEVCC04	Industrial Visit	Industrial Visit - II	0	0	0	0	0
PRACTICAL								
11	UEEE4PA	Professional Lab Course 3	Integrated Circuits Laboratory	2	0	0	2	1
12	UEEE4PB	Professional Lab Course 4	Electrical Machines -II Laboratory	2	0	0	2	1
13	UELECPD	Humanities and Social Science including Management Courses	Professional Communication	2	0	0	2	1
TOTAL				30	22	0	8	23



SEMESTER V

S. No	Course Code	Category	Course Title	Contact Hours	L	T	P	C
THEORY								
1.	UEMDC06	Humanities and Social Science including Management Courses	Professional Ethics and Human Values	3	3	0	0	3
2	UEITC02	Engineering Science Course	Data Science	3	3	0	0	3
3	UEEE501	Professional Core Course 7	Processor and Controllers for onboard ships	3	3	0	0	3
4	UEEE502	Professional Core Course 8	Control Systems	4	3	1	0	4
5		Professional Elective Course 1	PEC 1	3	3	0	0	3
6		Open Elective Course 2	OEC 2	3	3	0	0	3
7	UEVCC05	Employment Opportunity Course	Value Added Training Program-III	2	-	-	2	-
8	UEVCC06	Industrial Visit	Industrial Visit-III	-	-	-	-	-
PRACTICAL								
9	UEEE5PA	Professional Lab Course 5	Processor and Controllers Laboratory	2	0	0	2	1
10	UEEE5PB	Professional Lab Course 6	Control Systems Laboratory	2	0	0	2	1
11	UEEE5PC	Internship	Internship - 1	0	0	0	0	1
TOTAL				25	18	1	6	22



SEMESTER VI

S. No	Course Code	Category	Course Title	Contact Hours	L	T	P	C
THEORY								
1.	UEEE601	Professional Core Course 9	Power Electronics	3	3	0	0	3
2	UEEE602	Professional Core Course 10	Power System Analysis	3	3	0	0	3
3.	UEEE603	Professional Core Course 11	Marine Electrical Technology	3	3	0	0	3
4	UEITC03	Engineering Science Course	Artificial Intelligence	3	3	0	0	3
5		Professional Elective Course 2	PEC 2	3	3	0	0	3
6		Professional Elective Course 3	PEC 3	3	3	0	0	3
7		Open Elective Course 3	OEC 3	3	3	0	0	3
8	UEVCC07	Employment Opportunity Course	Professional Development Programme-I	2	2	0	0	0
9	UEVCC08	Employment Opportunity Course	Value Added Training Program-IV	2	-	-	2	-
10	UEVCC09	Industrial Visit	Industrial Visit-IV	-	-	-	-	-
PRACTICAL								
11	UEEE6PA	Professional Lab Course 7	Power Electronics Laboratory	2	0	0	2	1
12	UEEE6PB	Professional Lab Course 8	Marine Electrical Technology Laboratory	2	0	0	2	1
13	UEEE6PC	Project	Mini project	4	0	0	4	2
TOTAL				33	23	0	10	25



SEMESTER VII

S. No	Course Code	Category	Course Title	Contact Hours	L	T	P	C
THEORY								
1.	UEEE701	Professional Core Course 12	Power System Protection and Switchgear	3	3	0	0	3
2.	UEEE702	Professional Core Course 13	Solid State Drives	3	3	0	0	3
3	UEEE703	Professional Core Course 14	Marine Control Engineering and Automation	3	3	0	0	3
4		Open Elective Course 4	OEC 4	3	3	0	0	3
5		Professional Elective Course 4	PEC 4	3	3	0	0	3
6.	UEVCC10	Employment Opportunity Course	Professional Development Programme - II	2	2	0	0	0
7.	UEVCC11	Employment Opportunity Course	Value Added Training Program-V	2	-	-	2	-
8.	UEVCC12	Industrial Visit	Industrial Visit-V	-	-	-	-	-
PRACTICAL								
9.	UEEE7PA	Professional Lab Course 9	Marine Control Engineering and Automation Laboratory	2	0	0	2	1
10	UEEE7PB	Professional Lab Course 10	High Voltage Switchgear Laboratory	2	0	0	2	1
11	UEEE7PC	Project	Project Work - Phase 1	4	0	0	4	2
12.	UEEE7PD	Internship	Internship-2	0	0	0	0	1
TOTAL				27	17	0	10	20



SEMESTER VIII

S. No	Course Code	Category	Course Title	Contact Hours	L	T	P	C
THEORY								
1.		Professional Elective Course 5	PEC 5	3	3	0	0	3
2.		Professional Elective Course 6	PEC 6	3	3	0	0	3
3.	UEVCC13	Industrial Visit	Industrial Visit–VI	-	-	-	-	-
PRACTICAL								
4.	UEEE8PA	Project	Project Work - Phase 2	14	0	0	14	7
TOTAL				20	6	0	14	13



CBCS CURRICULUM (2020-21)

List of professional elective courses (PEC) offered by the Department

Sl. No.	Course Code	Title of the PEC	Contact Hours	L	T	P	C
PEC1							
1	UEEEEE01	Communication Engineering	3	3	0	0	3
2	UEEEEE02	Electrical Power Plant Engineering	3	3	0	0	3
3	UEEEEE03	Smart Technologies in Maritime Industry	3	3	0	0	3
4	UEEEEE04	Solar and Energy Storage System	3	3	0	0	3
5	UDEEEE05	Instrumentation and Control	3	3	0	0	3
6	UEEEEE06	Marine Electrical System Design and Layout	3	3	0	0	3
7	UEEEEE07	SWAYAM / MOOCs Course	3	3	0	0	3
PEC2							
1	UEEEEE08	PLC and SCADA Systems	3	3	0	0	3
2	UEEEEE09	Design of Electrical Apparatus	3	3	0	0	3
3	UEEEEE10	Measurements and Instrumentation	3	3	0	0	3
4	UEEEEE11	Wind Energy Conversion Systems	3	3	0	0	3
5	UEEEEE12	Bio-Medical Instrumentation	3	3	0	0	3
6	UEEEEE13	Marine Engineering - I	3	3	0	0	3
7	UEEEEE14	SWAYAM / MOOCs Course	3	3	0	0	3
PEC3							
1	UEEEEE15	Special Electrical Machines	3	3	0	0	3
2	UEEEEE16	Electrical Power Utilization and Illumination	3	3	0	0	3
3	UEEEEE17	AI and ML for Onboard ship Automation	3	3	0	0	3
4	UEEEEE18	High Voltage Engineering	3	3	0	0	3
5	UEEEEE19	Neuro Fuzzy and Genetic Programming	3	3	0	0	3
6	UEEEEE20	Process Control and Marine Automation	3	3	0	0	3
7	UEEEEE21	SWAYAM / MOOCs Course	3	3	0	0	3
PEC4							
1	UEEEEE22	Embedded System Design	3	3	0	0	3
2	UEEEEE23	Robotics and Automation	3	3	0	0	3
3	UEEEEE24	Industry 4.0	3	3	0	0	3
4	UEEEEE25	Wireless Sensor Networks	3	3	0	0	3
5	UEEEEE26	Distributed Computer Control Systems	3	3	0	0	3
6	UEEEEE27	Marine Engineering – II	3	3	0	0	3
7	UEEEEE28	SWAYAM / MOOCs Course	3	3	0	0	3



CBCS CURRICULUM (2020-21)

PEC5							
1	UEEEEE29	Power Electronics for Renewable Energy Systems	3	3	0	0	3
2	UEEEEE30	Power System Operation and Control	3	3	0	0	3
3	UEEEEE31	Energy Audit and Regulations	3	3	0	0	3
4	UEEEEE32	VLSI System Design	3	3	0	0	3
5	UEEEEE33	Internet of Things for shipping industry	3	3	0	0	3
6	UEEEEE34	Maintenance of Marine Electrical Equipment	3	3	0	0	3
7	UEEEEE35	SWAYAM / MOOCs Course	3	3	0	0	3
PEC 6							
1	UEEEEE36	Micro grids and smart grids	3	3	0	0	3
2	UEEEEE37	Total Quality Management	3	3	0	0	3
3	UEEEEE38	Flexible AC Transmission Systems	3	3	0	0	3
4	UEEEEE39	Modern Electric Vehicles	3	3	0	0	3
5	UEEEEE40	Power Quality	3	3	0	0	3
6	UEEEEE41	Marine Electrical Propulsion and Control	3	3	0	0	3
7	UEEEEE42	SWAYAM / MOOCs Course	3	3	0	0	3



CBCS CURRICULUM (2020-21)

List of open elective courses (OEC) offered by EEE Department

IV Sem

Sl. No.	Course Code	Title of the OEC1	Contact Hours	L	T	P	C
1	UEEEEO01	Hybrid Energy Resources in ships	3	3	0	0	3
2	UEEEEO02	Principles of Robotics and Applications	3	3	0	0	3
3	UEEEEO03	Industrial Electronics	3	3	0	0	3

V Sem

Sl. No.	Course Code	Title of the OEC2	Contact Hours	L	T	P	C
1	UEEEEO04	Smart Sensors	3	3	0	0	3
2	UEEEEO05	PLC and HMI in Automation	3	3	0	0	3
3	UEEEEO06	Basic Principles of Industrial Automation	3	3	0	0	3

VI Sem

Sl.No.	Course Code	Title of the OEC3	Contact Hours	L	T	P	C
1	UEEEEO07	Smart Shipping	3	3	0	0	3
2	UEEEEO08	Solar Energy Systems	3	3	0	0	3
3	UEEEEO09	Energy Management Systems	3	3	0	0	3

VII Sem

Sl.No.	Course Code	Title of the OEC4	Contact Hours	L	T	P	C
1	UEEEEO10	Electronic Navigation Equipments and Maintenance	3	3	0	0	3
2	UEEEEO11	Introduction to Electric Vehicles,	3	3	0	0	3
3	UEEEEO12	Internet of Things	3	3	0	0	3



AMET CURRICULUM – CREDIT SHARE

Semester	Contact Hours	Lecture	Tutorial	Practical	Credits
Semester 1	26	12	2	12	20
Semester 2	25	16	1	8	17
Semester 3	31	18	1	10	23
Semester 4	30	22	0	8	23
Semester 5	25	18	1	6	22
Semester 6	33	23	0	10	25
Semester 7	27	17	0	10	20
Semester 8	20	6	0	14	13
Total	217	132	5	78	163

Distribution of Credits

Humanities	Basic Science	Engineering Science	Professional Core	Professional Elective	Open Elective	Project /Internship	Total
12	25	30	53	18	12	13	163

