

# **CHOICE BASED CREDIT SYSTEM**

Department of Marine Engineering

B.E (Marine Engineering)

## **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.
- ❖ Be a Centre of Excellence in skill development in emerging 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 and enable all round personality development in students.
- ❖ Empower students from across socio economic strata.
- ❖ Make a positive difference to society through technical education.

## **VISION AND MISSION OF THE DEPARTMENT**

### **Vision**

To collaborate with global marine community to promote the innovation in maritime studies with a comprehensive approach by using suitable scientific and technological tools and methodologies.

### **Mission**

- To facilitate and promote advanced knowledge in Marine Engineering by providing infrastructure and research facilities so as to achieve excellence in marine and connected fields.
- To provide opportunities for the exchange of ideas and practices and upholding the status, standards and knowledge of marine professionals worldwide.
- To provide a platform for interdisciplinary teaching and research.
- To collaborate with other Institutions and industries to take appropriate measures for promoting innovations in teaching-learning process, inter- disciplinary studies and research.

## **PROGRAMME EDUCATIONAL OBJECTIVES (PEO)**

### **PEO1:**

Become successful Marine Engineers who are able to be competent, innovative and productive in addressing the needs of the Shipping Industry or pursue higher education and research.

### **PEO2:**

Grow professionally with their knowledge and proficient skills throughout their career.

### **PEO3:**

Demonstrate high standard of ethical conduct, positive attitude and societal responsibilities.

## **PROGRAM OUTCOMES (PO)**

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> 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.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> 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.
<b>PO 5</b>	<b>Modern tool usage:</b> 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.
<b>PO 6</b>	<b>The engineer and society:</b> 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.
<b>PO 7</b>	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO 10</b>	<b>Communication:</b> 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

<b>PO 11</b>	<b>Project Management and Finance:</b> 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
<b>PO 12</b>	<b>Life-long learning:</b> Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the

### **PROGRAMME SPECIFIC OBJECTIVES (PSO)**

PSO1	Attain knowledge to carry out the watch keeping duties of an engineer officer on board a ship in a safely manner
PSO2	Attain Knowledge to maintain and operate machinery and equipment fitted on board ships at operational level
PSO3	Achieve excellence in outstanding leadership in Marine Engineering position and passion for lifelong learning and research in advanced fields.



**DEPARTMENT OF MARINE ENGINEERING  
CURRICULUM FOR B.E. (MARINE ENGINEERING)  
ACADEMIC YEAR - 2021-2024  
SEMESTER I**

S. No	Course code	Category	Course Title	Contact Hours	L	T	P	C
<b>THEORY</b>								
1	UEPH101	Basic Science Course	Engineering Physics – I	2	2	0	0	2
2	UEMT102	Basic Science Course	Engineering Mathematics I	4	3	1	0	4
3	UEME104	Engineering Science Course	Engineering Mechanics I	3	3	0	0	3
4	UELE103	Humanities and Social Science including Management Courses	Technical English I	2	2	0	0	2
5	UEME106	Engineering Science Course	Thermal Engineering-I	3	3	0	0	3
6	UECH104	Basic Science Course	Engineering Chemistry	2	2	0	0	2
7	UEMDC01	Mandatory Course 1	Universal Human Values I - Induction program	3 Weeks	-	-	-	-
<b>PRACTICAL</b>								
8	UEME1PE	Engineering Science Course	Engineering Practices Laboratory I	6	0	0	6	3
9	UEPHCPA	Basic Science Course	Engineering Physics Lab	2	0	0	2	1
10	UEME1PB	Professional Core Course	Life Saving Lab	3	0	0	3	1
11	UEME1PC	Engineering Science Course	Thermal Engineering Lab	3	0	0	3	1
12	UECHCPA	Basic Science Course	Engineering Chemistry Laboratory	2	0	0	2	1
13	UEME1PF	Engineering Science Course	Engineering Graphics Laboratory	3	3	0	0	3
14	UESPCPA		PT/Parade/Games	0	0	0	0	1
15		Value Added Course	English - Personality Development - I	1	0	0	0	0
<b>Total</b>				<b>36</b>	<b>18</b>	<b>1</b>	<b>16</b>	<b>25</b>

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



Semester II

S. No	Course code	Category	Course Title	Contact Hours	L	T	P	C
<b>THEORY</b>								
1	UEPHC02	Basic Science Course	Engineering Physics – II	2	2	0	0	2
2	UEIT201	Engineering Science Course	Python for Problem Solving	2	2	0	0	2
3	UEME203	Engineering Science Course	Basic Electrical Engineering	3	3	0	0	3
4	UEMT201	Basic Science Course	Engineering Mathematics II	3	2	1	0	3
5	UEME205	Engineering Science Course	Engineering Mechanics-II	3	3	0	0	3
6	<b>UEMDC02</b>	<b>Mandatory Course 2</b>	<b>Environmental science</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>
7	UELE201	Humanities and Social Science including Management Courses	Technical English II	2	2	0	0	2
8	UEME208	Engineering Science Course	Thermal Engineering-II	3	3	0	0	3
9	UEME209	Engineering Science Course	Material Science and Metallurgy	3	3	0	0	3
<b>PRACTICAL</b>								
12	UEITCPA	Engineering Science Course	Python Programming Laboratory	2	0	0	2	1
13	UEME2PB	Engineering Science Course	Basic Electrical Engineering Laboratory	2	0	0	2	1
14	UEME2PD	Engineering Science Course	Engineering Practices Laboratory II	6	0	0	6	3
15	UESPCPB		PT/Parade/Games	0	0	0	0	1
16		Value Added Course	English - Personality Development - II	2	0	0	0	0
<b>Total</b>				<b>35</b>	<b>22</b>	<b>1</b>	<b>10</b>	<b>27</b>

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





Semester III

S. No	Subject Code	Category	Course Title	Contact Hours	L	T	P	C
<b>THEORY</b>								
1	UEME301	Engineering Science Course	Electrical Machines	3	3	0	0	3
		Open Elective Course	OEC -1	3	3	0	0	3
2	UEME302	Engineering Science Course	Integrated Circuit	3	3	0	0	3
3	UEME303	Engineering Science Course	Strength of Materials	3	3	0	0	3
4	UEME304	Engineering Science Course	PLC & Embedded System and Data Network	3	3	0	0	3
5	UEME305	Professional Core Course	Safety Emergency Measures & Practices I	4	4	0	0	4
<b>PRACTICAL</b>								
7	UEME3PA	Engineering Science Course	Electrical Machines Lab	2	0	0	2	1
8	UEME3PB	Engineering Science Course	Integrated Circuit Lab	2	0	0	2	1
9	UEME3PC	Engineering Science Course	PLC Lab	3	0	0	3	1
10	UEME3PD	Engineering Science Course	Strength of Materials Lab	2	0	0	2	1
11	UEME3PE	Engineering Science Course	Engineering Practices Laboratory III	6	0	0	6	3
12	UESPCPC		PT/Parade/Games	0	0	0	0	1
13		Value Added Course	English - Personality Development - III	2	0	0	0	0
<b>Total</b>				<b>36</b>	<b>19</b>	<b>0</b>	<b>15</b>	<b>27</b>

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



Semester IV

S. No	Subject Code	Category	Course Title	Contact Hours	L	T	P	C
<b>THEORY</b>								
1	UEME402	Open Elective	OEC -2	3	3	0	0	3
2	UEME403	Professional Core Elective	PEC -1	4	4	0	0	4
3	UEME404	Professional Core Course	Marine Electrical Technology I	3	3	0	0	3
4	UEME405	Engineering Science Course	Microprocessor and Microcontroller	3	3	0	0	3
5	UEME406	Professional Core Course	Pumps & Pumping Systems-I	3	3	0	0	3
6	UEME407	Professional Core Course	Marine Electrical Measurements	3	3	0	0	3
7	UEME408	Professional Core Course	Marine Refrigeration & Air Conditioning	3	3	0	0	3
8	UEMT401	Basic Science	Mathematical Foundation for Data Science and Artificial Intelligence	1	1	1	0	2
<b>PRACTICAL</b>								
10	UEME4PA	Professional Core Course	Marine Refrigeration & Air Conditioning Laboratory	2	0	0	2	1
11	UEME4PB	Professional Core Course	Marine Electrical Lab – I	2	0	0	2	1
12	UEME4PC	Engineering Science Course	Micro Processor & Micro Controller Lab	2	0	0	2	1
13	UEME4PD	Engineering Science Course	Engineering Practices Laboratory IV	6	0	0	6	3
14	UESPCPD		PT/Parade/Games	0	0	0	0	1
15		Value Added Course	English - Personality Development - IV	1	0	0	0	0
<b>Total</b>				<b>36</b>	<b>23</b>	<b>1</b>	<b>12</b>	<b>31</b>

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



Semester V

S. No	Subject Code	Category	Course Title	Contact Hours	L	T	P	C
<b>THEORY</b>								
1	UEME501	Professional Core Elective	PEC - 2	3	3	0	0	3
2	UEME502	Professional Core Course	Marine Auxiliary Machinery – I	4	4	0	0	4
3	UEME503	Professional Core Course	Marine Electrical Technology – II	2	2	0	0	2
4	UEME505	Professional Core Course	Marine Internal Combustion Engines-I	5	5	0	0	5
5	UEME506	Professional Core Course	Naval Architecture – I	3	3	0	0	3
6	UEME507	Professional Core Course	Pumps & Pumping System – II	3	3	0	0	3
7	UEME508	Professional Core Course	Safety Emergency Measures & Practices II	3	3	0	0	3
8	UEIT501	Engineering Science Course	Data Science	1	1	0	0	1
<b>PRACTICAL</b>								
9	UEME5PA	Professional Core Course	Basic Fire Fighting Lab	4	0	0	4	2
10	UEME5PB	Professional Core Course	Marine Electrical Technology Laboratory II	2	0	0	2	1
11	UEME504	Professional Core Course	Marine Engineering Equipment Drawing - I	3	0	0	3	1
12	UEME5PC	Engineering Science Course	Fluid Mechanics Lab	2	0	0	2	1
13	UESPCPE		PT/Parade/Games	0	0	0	0	1
14		Value Added Course	ScaleUp - Personality Development - I	1	0	0	0	0
<b>Total</b>				<b>36</b>	<b>24</b>	<b>0</b>	<b>11</b>	<b>32</b>

\*Note for DGS Programme one credit is allotted for the PT/Parade/Games

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



Semester VI

S. No	Subject Code	Category	Course Title	Contact Hours	L	T	P	C
<b>THEORY</b>								
1	UEME601	Professional Core Course	Marine Auxiliary Machinery – II	4	4	0	0	4
2	UEME602	Professional Elective Course	PEC - 3	3	3	0	0	3
3	UEME603	Professional Core Course	Marine Internal Combustion Engines-II	5	5	0	0	5
4	UEME604	Professional Core Course	Marine Engineering Practice	4	4	0	0	4
5	UEME605	Engineering Science Course	Power Electronics, High Voltage & Electric propulsion	2	2	0	0	2
6	UEME606	Professional Core Course	Safety Emergency Measures & Practice III	3	3	0	0	3
7	UEME607	Professional Core Course	Naval Architecture – II	3	3	0	0	3
	UEIT601	Engineering Science Course	Artificial Intelligence	2	2	0	0	2
<b>PRACTICAL</b>								
8	UEME6PA	Professional Core Course	Advanced Electrical Engineering Lab.	3	0	0	3	1
9	UEME6PB	Engineering Science Course	Internal Combustion Engine Lab	4	0	0	4	2
10	UEME6PC	Engineering Science Course	Power Electronics Lab	2	0	0	2	1
11	UESPCPF		PT/Parade/Games	0	0	0	0	1
12		Value Added Course	ScaleUp - Personality Development - II	1	0	0	0	0
<b>Total</b>				<b>36</b>	<b>26</b>	<b>0</b>	<b>9</b>	<b>31</b>

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



Semester VII

S. No	Subject Code	Category	Course Title	Contact Hours	L	T	P	C
<b>THEORY</b>								
1	UEME701	Professional Elective Course	PEC - 4	3	3	0	0	3
2	UEME702	Professional Core Course	Marine Control Engineering & Automation	3	3	0	0	3
3	UEME703	Professional Core Course	Shipboard Leadership & Management	2	2	0	0	2
<b>INTERNSHIP/AFLOAT TRAINING</b>								
4	UEME7S1	Professional Core Course	Ship Construction & Stability & Marine Environment Protection	19	-	-	19	3
5	UEME7S2	Professional Core Course	Electro Technology		-	-		3
6	UEME7PC	Professional Core Course	Internship I		-	-		3
7	UEME7PD	Professional Core Course	Viva – Voce I		-	-		3
<b>PRACTICAL</b>								
8	UEME7PA	Professional Core Course	Automation Laboratory	2	0	0	2	0
9	UEME7PB	Professional Core Course	Project work	6	0	0	6	5
10	UESPCPG		PT/Parade/Games	0	0	0	0	1
11		Value Added Course	ScaleUp - Personality Development - III	1	0	0	0	0
<b>Total</b>				<b>36</b>	<b>8</b>	<b>0</b>	<b>27</b>	<b>27</b>

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



Semester VIII

S. No	Subject Code	Category	Course Title	Contact Hours	L	T	P	C
<b>THEORY</b>								
1	UEME802	Professional Core Course	Safety Emergency Measures & Practices-IV	3	3	0	0	3
2	UEME803	Engineering Science Course	Mechanics of Machines	3	3	0	0	3
3	UEME804	Professional Core Course	Instrumentation & Control	3	3	0	0	3
4	UEME805	Engineering Science Course	Pneumatics, Hydraulics & Electrical Control Systems	2	2	0	0	2
<b>INTERNSHIP/AFLOAT TRAINING</b>								
5	UEME8S1	Professional Core Course	Engineering Knowledge( General & Motor)	19	-	-	19	3
6	UEME8S2	Professional Core Course	Shipboard Safety		-	-		3
7	UEME8PC	Professional Core Course	Internship II		-	-		3
8	UEME8PD	Professional Core Course	Viva-Voce II		-	-		3
<b>PRACTICAL</b>								
9	UEME8PA	Engineering Science Course	Pneumatics, Hydraulics & Electrical Control System Lab	2	0	0	2	1
10	UEME801	Professional Core Course	Marine Engineering Equipment Drawing-II	3	0	0	3	2
11	UESPCPH		PT/Parade/Games	0	0	0	0	1
12		Value Added Course	ScaleUp - Personality Development - IV	1	0	0	0	0
<b>Total</b>				<b>36</b>	<b>11</b>	<b>0</b>	<b>24</b>	<b>27</b>

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



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

Sl. No.	Subject Code	Title of the PEC	Contact Hours	L	T	P	C
<b>PEC1 (IV Sem)</b>							
1	UEMEE01	Marine Resource Management	4	4	0	0	4
2	UEMEE02	Cross Docking	4	4	0	0	4
3	UEMEE03	Marine Vibration Measurement Techniques	4	4	0	0	4
4	UEME403	Marine Boilers and Steam Engineering	4	4	0	0	4
<b>PEC2 (V Sem)</b>							
1	UEME501	Ship Fire Prevention & Control	3	3	0	0	3
2	UEMEE06	Renewable Energy applied for Marine Engineering	3	3	0	0	3
3	UEMEE07	Safety Resources Management on board ships	3	3	0	0	3
<b>PEC3 (VI Sem)</b>							
1	UEME602	Marine Environmental Protection	3	3	0	0	3
2	UEMEE08	Surface engineering and coating technology	3	3	0	0	3
3	UEMEE09	Emergency management & damage control	3	3	0	0	3
<b>PEC4 (VII Sem)</b>							
1	UEME701	IMO & International Convention	3	3	0	0	3
2	UEMEE11	Dry Docking and Ship Repair	3	3	0	0	3
3	UEMEE12	Energy Efficient Ship Operation	3	3	0	0	3



**List of open elective courses (OEC) offered of all the Undergraduate Degree Programmes**

**III Semester**

Sl. No.	Subject Code	Title of the OEC3	Contact Hours	L	T	P	C
1	UEMEO01	Ship Safety and Environmental Protection	3	3	0	0	3
2	UEMEO02	Ship Recycling	3	3	0	0	3
3	UEME402	Fuel Lubrication and Technology	3	3	0	0	3
1	UEMEO04	Special duty vessels and Types of Operation	3	3	0	0	3
2	UEMEO05	Marine Corrosion and Prevention	3	3	0	0	3

**IV Semester**

Sl. No.	Subject Code	Title of the OEC5	Contact Hours	L	T	P	C
1	UEMEO07	Material handling Equipments	3	3	0	0	3
2	UEMEO08	Risk Management	3	3	0	0	3
1	UEMEO09	Fire Fighting and Controls	3	3	0	0	3
2	UEMEO10	Roles of Classification Society	3	3	0	0	3





<b>Semester</b>	<b>Credits</b>
<b>Semester 1</b>	<b>25</b>
<b>Semester 2</b>	<b>27</b>
<b>Semester 3</b>	<b>27</b>
<b>Semester 4</b>	<b>31</b>
<b>Semester 5</b>	<b>32</b>
<b>Semester 6</b>	<b>31</b>
<b>Semester 7</b>	<b>27</b>
<b>Semester 8</b>	<b>27</b>
<b>Total</b>	<b>227</b>

**COMMON FRAME WORK FOR CURRICULUM DEVELOPMENT  
AMET CURRICULUM – CREDIT SHARE**

<b>Humanities</b>	<b>Basic Science</b>	<b>Engineering Science</b>	<b>Professional Core</b>	<b>Professional Elective</b>	<b>Open Elective</b>	<b>Project</b>	<b>PT/Parade</b>	<b>Total</b>
4	17	73	101	13	6	5	8	227