

MARINE ENGINEERING PROGRAMMES

PROGRAMME HANDBOOK

AKADEMI LAUT MALAYSIA MARINE ENGINEERING DEPARTMENT

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PROGRAMMES OFFERED BY

PRE SEA MARINE ENGINEERING DEPARTMENT





A Diploma in Marine Engineering (DME)



Programme Educational Objectives (PEOs)

Four to five years upon successful completion of the programme, the Diploma of Marine Engineering programme will produce Marine Engineering practitioners who:

PEO 1

Analyse and apply the knowledge, understanding and proficiency while providing services to the maritime industry.

PEO 2

Lead and engage in teams in problemsolving tasks through analytical thinking and effective communicative abilities

PEO 3

Continue to advance his/her knowledge and competencies to explore future development in the maritime industries.

PEO 4

Practice ethical and professional values in providing services to the recipients and providers of the maritime industry.



Programme Learning Outcomes (PLOs)

PLO 1

Apply basic mathematical, scientific and engineering knowledge in marine engineering principles and practices.

PLO₂

Analyse marine engineering problems related to operations and maintenance at the operational level.

PLO₃

Identify and propose possible solutions with regards to marine engineering issues.

PLO 4

Apply appropriate techniques, resources and marine engineering tools to related activities, with an awareness of situational and safety limitations.

PLO 5

Demonstrate knowledge of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to marine practice.

PLO 6

Communicate effectively on marinerelated activities within the community and society.

PLO 7

Function effectively as an individual and a member of a team.

PLO 8

Display an understanding of professional ethics, responsibilities and norms of marine engineering practices.

PLO₉

Demonstrate awareness of management, business practices and entrepreneurship.

PLO 10

Demonstrate an understanding of the impact of engineering practices on the environment, taking into account the need for sustainability.

PLO 11

Recognize professional development needs and engage with self-improvement and lifelong learning.



Programme Curriculum Structure (by semester)

No.	Code	Subjects	Credit Hours
1.	DEA 1113	Introduction to Engineering Science	3
2.	DEA 1122	Introduction to Engineering Mathematics	2
3.	DEA 1132	Introduction to Engineering Thermodynamics	2
4.	DEA 1611	Basic Applied Mechanics	1
5.	DEA 1142	Introduction to Industrial Chemistry	2
6.	DEA 1013	Maritime English	3
7.	MPU 2411	Co-Curriculum I	1
8.	DEA 1912	Maintenance & Repair - Metal Working Skills	2
9.	DEA 1413	Marine Engineering Knowledge	3
Total Credit Hours			

Code	Subjects	Credit Hours	
DEA 1152	Differential & Integral Calculus	2	
DEA 1162	Introduction to Thermodynamic Processes	2	
DEA 1622	Fluid Mechanics	2	
DEA 1631	Engineering Materials	1	
MPU 2421	Co-Curriculum II	1	
DEA 1922	Maintenance & Repair - Machining Skills	2	
DEA 1213	Marine Automatic Control Systems	3	
MPU 2212	Professional Ethics	2	
DEA 1423	Engineering Knowledge General I	3	
DEA 1712	Basic Marine Electro technology	2	
Total Credit Hours			
	DEA 1152 DEA 1162 DEA 1622 DEA 1631 MPU 2421 DEA 1922 DEA 1213 MPU 2212 DEA 1423 DEA 1712	DEA 1152 Differential & Integral Calculus DEA 1162 Introduction to Thermodynamic Processes DEA 1622 Fluid Mechanics DEA 1631 Engineering Materials MPU 2421 Co-Curriculum II DEA 1922 Maintenance & Repair - Machining Skills DEA 1213 Marine Automatic Control Systems MPU 2212 Professional Ethics DEA 1423 Engineering Knowledge General I DEA 1712 Basic Marine Electro technology	

No.	Code	Subjects	Credit Hours		
1.	DEA 2173	Applied Thermodynamics I	3		
2.	DEA 2223	Marine Control & Automation	3		
3.	DEA 2813 / MPU 2313	Application of Leadership & Team Working Skills	3		
4.	DEA 2723	Fundamental of Alternating Current	3		
5.	DEA 2731	Marine Electrical Practice I	1		
6.	MPU 2113 / MPU 2123	Pengajian Malaysia / Bahasa Melayu Komunikasi	3		
7.	DEA 2933	Plant Training I	3		
8.	DEA 2512	Engineering Drawing	2		
Total	Total Credit Hours 21				

No.	Code	Subjects	Credit Hours		
1.	DEA 2312	Naval Architecture	2		
2.	DEA 2183	Applied Thermodynamics II	3		
3.	DEA 2431	Marine Steam Turbines	1		
4.	DEA 2433	Engineering Knowledge General II	3		
5.	DEA 2743	Advances Marine Electro Technology	3		
6.	DEA 2751	Electronic Circuits	1		
7.	DEA 2762	Marine Electrical Practice II	2		
8.	DEA 2943	Plant Training II	3		
9.	DEA 2521	Engineering Design	1		
Tota	Total Credit Hours 19				

No.	Code	Subjects	Credit Hours
1.	DEA 3956	Shipboard Training I	6
Total	Credit Hours		6

No.	Code	Subjects	Credit Hours
1.	DEA 3966	Shipboard Training II	6
Tota	Credit Hours		6

No.	Code	Subjects	Credit Hours	
1.	DEA 4323	Ship Construction	3	
2.	DEA 4453	Engineering Knowledge General III	3	
3.	DEA 4463	Marine Diesel Engines	3	
4.	DEA 4472	Marine Steam Boilers	2	
5.	DEA 4822	Watch Keeping Preparatory	2	
6.	DEA 4021	Applied Computing	1	
Total Credit Hours				



Programme Courses Synopsis (by semester)

Semester 1

DEA 1113

Introduction to Engineering Science

The subject aims to provide students with an understanding of the fundamental of engineering science. The module shall familiarize the students with the elementary principles and theorems relating to each topic and apply these principles to engineering problems.

DEA 1122

Introduction to Engineering Mathematics

The subject aims to provide students with an understanding of the fundamental of engineering mathematics. The module shall familiarize the students with the elementary and theorems relating to each topic and apply these principles to engineering problems.

DEA 1132

Introduction to Engineering Thermodynamics

The subject aims to provide students with basic knowledge of the Principle of Thermodynamics.

DEA 1611

Basic Applied Mechanics

The subject aims to provide students with an understanding of the fundamental of Mechanics. The module shall familiarize the students in analysing the elementary and theorems relating to forces equilibrium, emphasising the application of these principles to engineering problems.

DEA 1142

Introduction to Industrial Chemistry

The subject aims to provide students with basic knowledge of industrial chemistry.

DEA 1013

Maritime English

The subject aims to familiarize students with the IMO SMCP, Maritime English vocabulary, and shipping terms.
The subject shall prepare students for developing the knowledge, understanding and proficiency in Maritime English, especially the SMCP (Stand ard Marine Communication Phrases) and Marine Communication.

MPU 2411

Co-Curriculum I

The subject aims to provide learners with the basic skills of one of the following: Band, Corporate Social Responsibility (CSR) Project, Dragon Boat, First Aider, Kayaking and Swimming.

DEA 1912

Maintenance & Repair

- Metal Working Skills

The subject aims to provide students with an understanding of the fundamental of metalworking skills.

DEA 1413

Marine Engineering Knowledge

The subject aims to provide students with a general knowledge of ships' main propulsion engines and their associated auxiliary machinery, including diesel engines, marine boilers, steam turbines, and gas turbines.

DEA 1152

Differential & Integral Calculus

The subject aims to provide students with an understanding of the fundamentals of trigonometry, algebra, and calculus. The module shall familiarize the students with the elementary principles and theorems relating to each topic and apply these principles to engineering problems.

DEA 1162

Introduction to Thermodynamic Processes

The subject aims to enable students to demonstrate knowledge and understanding of basic Thermodynamic processes.

DEA 1622

Fluid Mechanics

The subject aims to provide students with basic knowledge of fluid mechanics.

DEA 1631

Engineering Materials

The subject aims to provide students with basic knowledge of engineering materials.

MPU 2421

Co-Curriculum II

The subject aims to enable the students to gain a working knowledge of CAD 3D modelling. Theoretical concepts of engineering graphics, including orthographic projection, auxiliary views, and sectioning general dimensioning and tolerancing and geometric, determine if the criteria of that assignment have been met. Students are also given the opportunity to select the other subject offered under Co-Curricular I yet to take during Semester I.

DEA 1922

Maintenance & Repair

- Machining Skills

The subject aims to provide students with an understanding of the fundamental of machining skills.

DEA 1213

Marine Automatic Control Systems

The subject aims to provide students with basic knowledge of automatic control systems used onboard ships.

MPU 2212

Professional Ethics

The subject aims to provide students with basic knowledge of professional ethics.

DEA 1423

Engineering Knowledge General I

The subject aims to provide students with working knowledge of operating main and auxiliary machinery and associated control systems.

DEA 1712

Basic Marine Electro Technology

The subject aims to provide learners with working knowledge by introducing the concepts of electrical resistance, voltage, current flow in dc and ac circuits, and understanding of lighting, cables, and hatteries.

DEA 2173

Applied Thermodynamics I

The subject aims to provide students with working knowledge of the application of Thermodynamics with reference to the system found onboard ships.

DEA 2223

Marine Control & Automation

The subject aims to provide students with further knowledge in automatic control systems, and components found onboard ships.

DEA 2813 / MPU 2313

Application of Leadership & Team Working Skills

The subject aims to provide a person with the knowledge, skill, and understanding of leadership and teamwork at the operational level on board ships.

DEA 2723

Fundamentals of Alternating Current

The subject aims to provide students with the working understanding, identification, and working principle of alternating current. The module will also familiarize with the power distribution system and high voltage installation.

DEA 2731

Marine Electrical Practice I

The subject aims to enable students to understand the maintenance and repair carried out on electrical equipment onboard ships.

MPU 2123

Bahasa Melayu Komunikasi

Matapelajaran ini membolehkan pelajar memahami dan menguasai kemahiran asas Bahasa Melayu dan kecekapan berbahasa untuk berkomunikasi bagi melahirkan idea dan perasaan secara lisan dan penulisan.

MPU 2113

Pengajian Malaysia

Matapelajaran ini bertujuan melahirkan pelajar yang memahami peranannya dalam proses pembinaan negara bangsa dan bersemangat patriotic dalam menghadapi cabaran pembangunan.

DEA 2933

Plant Training I

The subject aims to equip the students with the knowledge of working safety procedures and equipment in the workshop and on board ship.

DEA 2512

Engineering Drawing

The subject aims to enable students to demonstrate an adequate skill related to engineering drawing information and requirements, including identifying different displays of drawing from a mechanical product assembly drawing.

DEA 2312

Naval Architecture

The subject aims to provide students with fundamentals in Naval Architecture.

DEA 2183

Applied Thermodynamics II

The subject aims to provide students with working knowledge of Thermodynamics with reference to the system found on board ship.

DEA 2431

Marine Steam Turbines

The subject aims to provide students with working knowledge of the construction and operation of marine steam turbines.

DEA 2443

Engineering Knowledge General II

The subject aims to provide students with working knowledge of operating main and auxiliary machinery and associated control systems.

DEA 2743

Advanced Marine Electro Technology

The subject aims to provide students with working understanding, identification and working principle of generators and motors electronic components in the circuit. This module will also provide students with an understanding of motor starting.

DEA 2751

Electronics Circuits

The subject aims to provide students with basic knowledge of electronic circuits.

DEA 2762

Marine Electrical Practice II

The subject aims to enable students to understand the detection of electric malfunction and measures to prevent damage.

DEA 2943

Plant Training II

The subject aims to equip the students with knowledge of working safety procedures and equipment in the workshop and on board ship.

DEA 2521

Engineering Design

To provide students with an understanding of basic engineering design concepts with the introduction of the Finite Element Method (FEM) design analysis using CAD/CAE software. The module shall familiarize the students in analysing the strength and stiffness of machine parts due to the effects of loading. The module shall also familiarize the students in the process of selection and purchase of standard machinery components.

Semester 5 & 6

DEA 3956

Shipboard Training I &

DEA 3966

Shipboard Training II

This Shipboard Practical Training aims to use the Training and Assessment Record Book (TARB) onboard to demonstrate competence to undertake the functions in accordance with STCW Code & IMO Model Course 7.04. Satisfactorily completed, this book shall serve as documentary evidence that a cadet has completed a properly structured training programme approved by the Director of Marine and demonstrated competence in the skill required by Rules and the Standards of Competence of Officer.

Upon returning to campus, the student needs to sit an assessment for a quick check on demonstrating knowledge, understanding, and appropriate decision-making during shipboard training.

Semester 7

DEA 4323

Ship Construction

The subject aims to provide students with working knowledge of ship construction.

DEA 4453

Engineering Knowledge General III

The subject aims to provide students with working knowledge of operating main and auxiliary machinery and associated control systems.

DEA 4463

Marine Diesel Engines

The subject aims to provide students with theoretical explanations on the main propulsion machinery after undergoing the sea-phase of the programme.

DEA 4472

Marine Steam Boiler

The subject aims to provide students with working knowledge of marine boiler construction and operation.

DEA 4822

Watch Keeping Preparatory

The subject aims to provide students with knowledge of watchkeeping principles and engineering on board ships.

DEA 4021

Applied Computing

The subject aims to provide the students with basic knowledge of computer.

Internal Assessment Scheme

1. Passing Criteria

- · 50% in each LCA (minimum 2 LCAs for each subject)
- · 50% in Final examination + 50% Overall (LCA+ FINAL).



B Marine Engineering Bridging Course for Mechanical Engineer (AEBC)



Programme Educational Objectives (PEOs)

Programme Objectives

On completion of the programme, students will have sufficient knowledge of the basic principles to be observed in keeping an engineering watch as per STCW Regulation III/2, and III/1 with respect to STCW 2010 and national requirements and will have sufficient knowledge, understanding and skill to carry out that part of duties and responsibilities concerned with the operation, maintenance and repair of:

- · Marine Machinery
- Electrical, Electronic and Control Equipment
- Controlling the Operation of the Ship
- · Care for Persons on board

Programme Aim

The programme aims to provide the students with the knowledge, understanding and skill necessary to prepare Engineering graduates who meet the entry requirements for the Watchkeeper Certificate of Competency (Motor/Steam) for unlimited voyages.

The course is conducted in 4 phases, and students will need to complete the mandatorily required phases as stipulated by the Director of Marine, Marine Department Malaysia. Exemption from any of the phases will only be granted by the Director of Marine, Marine Department, Malaysia.

The following are the 4 phases:

- Phase 1 Ship familiarization and workshop training in the academy
- Phase 2 Academic and Professional Studies in the Academy
- Phase 3 Shipboard / Sea Training
- Phase 4 Oral preparatory course



Programme Curriculum Structure (by phase)

Phase 1

No.	Code	Subjects	Credit Hours
1.	DEB 1413	Marine Engineering Knowledge	3
2.	DEB 1714	Electrotechnology and Power Electronics	4
3.	DEB 1313	Naval Architecture and Ship Construction	3
4.	DEB 1213	Marine Controls and Automation	3
5.	DEB 1913	Marine Engineering Laboratory	3
Tota	19		

Phase 2

No.	Code	Subjects	Credit Hours		
1.	DEB 1433	Engineering Knowledge (Motor)	3		
2.	DEB 1423	Engineering Knowledge (General)	3		
3.	DEB 1443	Engineering Knowledge (Steam)	3		
4.	DEB 1723	Marine Electrical Practice	3		
5.	DEB 1923	Marine Plant Maintenance	3		
Tota	Total Credit Hours 15				

Phase 3 (4 Weeks)

No. Subjects	Week
1. Basic Safety Training	1
2. Proficiency in Survival Craft & Rescue Boat	1
3. Advanced Fire Fighting	1
4. Medical First Aid	1
Total Weeks	

Phase 4: Industrial Training Onboard Ships (52 Weeks)

Shipboard Training (with Shipboard Training Record Book) 18 credits

Phase 5 (2 Weeks)

Oral Preparatory & Watch-keeping Course	Classroom	Practical
Marine Engineering Watch Keeping course	32 hours	NIL
Oral Examination Preparatory Course (Including Mock Oral)	48 hours	NIL
Subtotal	80 hours	NIL
AEBC Total Duration	83 Weeks	



Programme Courses Synopsis (by phase)

Phase 1

DEB 1413

Marine Engineering Knowledge

The subject provides the students with a general working knowledge of ships' main propulsion engines and their associated auxiliary machinery, including diesel engines, marine boilers, steam turbines, and gas turbines.

DEB 1714

Electrotechnology and Power Electronics

The subject provides the students with the working knowledge of alternating the current theory and principles of the 3 phase ac system and introduction to electronics integrated with the power system.

DEB 1213

Marine Controls and Automation

The subject provides the students with the knowledge and of the working principles of marine controls and automation.

DEB 1313

Naval Architecture and Ship Construction

The subject provides the students with an understanding of the principles that maintain the stability of oceangoing ships under various conditions of cargo loading and seaway.

The subject also provides an understanding of the design and constructional aspects of ships with reference to effective maintenance.

DEB 1913

Marine Engineering Laboratory

The subject equips the students with knowledge of safety procedures and equipment in the workshop and onboard ship.

Phase 2

DEB 1433

Engineering Knowledge (Motor)

The subject provides the students with knowledge and understanding of the constructional, operational and related systems of marine diesel engines.

DEB 1423

Engineering Knowledge (General)

The subject provides the students with the knowledge and understanding of the constructional, operational, and related systems, especially marine auxiliary machinery.

DEB 1443

Engineering Knowledge (Steam)

The subject provides the students with the knowledge and understanding of the constructional, operational, and related systems, especially marine auxiliary machinery.

DEB 1723

Marine Electrical Practice

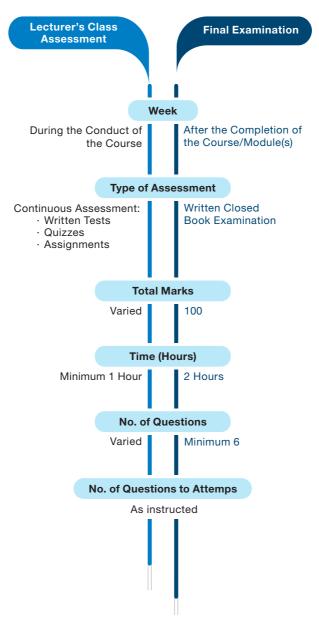
The subject provides the knowledge to operate and maintain the shipboard electrical system safely.

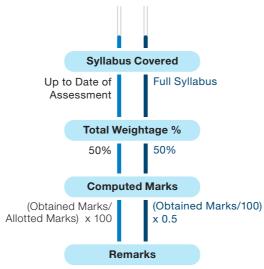
DEB 1923

Marine Plant Maintenance

The subject equips the students with the knowledge of working safety procedures and equipment in the workshop and onboard ship.

Examination Scheme





- 1. A minimum of 2 LCAs will be conducted of which at least one will be a written test.
- 2. 50% weightage will be applied on the average of computed marks for all LCAs.



Notes:

- 1. Passing criteria:
 - · 50% in each LCA (minimum 2 LCA for each subject)
 - · 50% in Final examination + 50% Overall (LCA+ FINAL).
- 2. A final assessment by viva-voce will be conducted by Marine Department, Malaysia. Certification will be by Marine Department, Malaysia.
- 3. For Practical Assessments, relevant assessment sheets are used to evaluate skill levels and safe working practices.
- 4. Oral Assessment based on TARB book will be carried out after completion of the shipboard training.



C Officer in Charge of an Engineering Watch 750kW or More Near Coastal Voyage (AWKE)



Programme Educational Objectives (PEOs)

On completion of the course, students will have sufficient knowledge, understanding and skill to carry out that part of duties and responsibilities to the levels of knowledge, understanding and proficiency required for certification of officers as laid down in Rules 17A, JL/P/01/2009, Standards of Competence, Marine Department Malaysia for the following Functions:

- · FUNCTION 1 Marine Engineering at the operational level
- FUNCTION 2 Electrical, electronic and control engineering at the operational level
- · FUNCTION 3 Maintenance and Repair at the operational level
- FUNCTION 4 Controlling of the operation of the ship and care for persons on board at the operational level
- · Maritime English
- · Leadership and Teamworking



Programme Learning Outcomes (PLOs)

At the end of this programme, students should be able to:

PLO 1

Use appropriate tools for fabrication and repair on board.

PLO₂

Use of hand tools, electrical and electronic measuring and test equipment for fault finding maintenance and repair.

PLO₃

Maintain a safe engineering watch.

PLO 4

Use English in written and oral form.

PLO 5

Understand electrical, electronic and control engineering.

PLO 6

Understand maintenance and repair at the operational level.

PLO 7

Ensure compliance with pollution prevention requirements.

PLO 8

Understand ship construction.

PLO 9

Monitor compliance with Legislative Requirements.



Programme Curriculum Structure (by semester)

No.	Subjects	Credit Hours
1.	Engineering Knowledge Motor (EKM)	106
2.	Engineering Knowledge General (EKG)	213
3.	Naval Architecture and Ship Construction (NASC)	29
4.	Maritime English	60
5.	Maritime Legislation	26
6.	Leadership and Teamwork	20
7.	Marine Electrical Practice (MEP)	136
Tot	590	



Engineering Knowledge Motor (EKM)

The module provides the students with the knowledge and understanding of Diesel engines, boilers and associated systems. It also provides the students with the ability to operate, monitor, manage and evaluate engine performance and capacity, maintains the safety of equipment, systems and services.

Engineering Knowledge General (EKG)

The subject aims to provide students with working knowledge of operating main and auxiliary machinery and associated control systems.

Naval Architecture and Ship Construction (NASC)

The subject aims to provide students with fundamentals in Naval Architecture.

Maritime English

The subject aims to familiarize students with the IMO SMCP, Maritime English vocabulary, and shipping terms. The subject shall prepare students for developing the knowledge, understanding and proficiency in Maritime English, especially the SMCP (Standard Marine Communication Phrases) and Marine Communication.

Maritime Legislation

The subject provides the students with the basic working knowledge of the relevant IMO conventions concerning the safety of life at sea, security and protection of the marine environment.

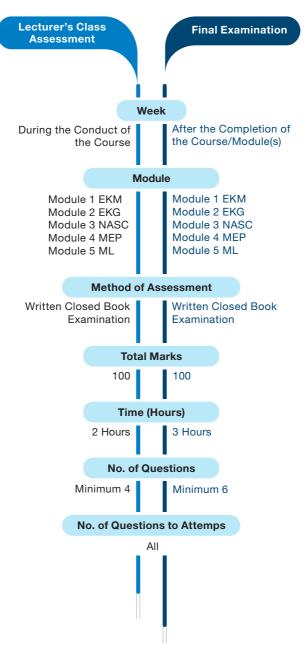
Leadership & Teamwork

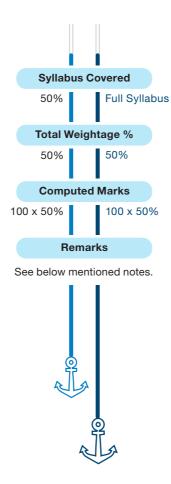
The subject aims to provide a person with the knowledge, skill, and understanding of leadership and teamwork at the operational level on board ships.

Marine Electrical Practice (MEP)

The subject aims to enable students to understand the maintenance and repair done on electrical equipment onboard ships.

Examination Scheme





Notes:

- 1. Passing criteria:
 - · 50% in LCA
 - · 50% in Final Examination + 50% Overall (LCA + Final)
- 2. A final assessment by viva-voce will be conducted by Marine Department, Malaysia. Certification will be by Marine Department, Malaysia.
- 3. Maritime English, Maritime Legislation, and Leadership and Teamwork assessed in Module 5 paper.









A Chief and Second Engineer 3000kW or More (Motor) Near Coastal Voyage (ACSC1)



Programme Educational Objectives (PEOs)

On completion of the course, students will have sufficient knowledge, understanding and skill to carry out that part of duties and responsibilities to the levels of knowledge, understanding and proficiency required for certification of officers as laid down by Marine Department, Malaysia for the following functions:

- · Marine Engineering
- · Electrical, electronic and control engineering
- · Maintenance and Repair
- · Controlling the operation of the ship and Care for persons on board



Programme Learning Outcomes (PLOs)

To produce well-rounded graduates with the following outcomes:

PLO 1

Apply knowledge, understanding and proficiency of theories and principles of shipboard machinery.

PLO₂

Discover, process, interpret, analyze and predict problems related to marine engineering at operational and management level.

PLO₃

Identify and suggest possible solutions to marine engineering issues.

Communicate and articulate information and ideas effectively in both verbal and written forms.

PLO 4

Work effectively in a multinational ambience applying team working skills.

PLO 5

Apply values, ethics, morality and professionalism in their career pursuit.

PLO 6

Manage information and engage in life – long learning.

PLO 7

Apply managerial and entrepreneurial skills contributing to the safety of personnel and ship.

PLO 8

Demonstrate leadership qualities.

PLO 9

Demonstrate leadership qualities.



Programme Curriculum Structure

No.	Subjects	Contact Hours	
1.	Electrotechnology & Marine Electrical Practice	60	
2.	Naval Architecture & Ship Construction	60	
3.	Engineering Knowledge (Motor)	120	
4.	Engineering Knowledge (General)	120	
Tot	Total Contact Hours 360		



Module 1

Electrotechnology and Marine Electrical Practice

The module provides students with the knowledge and skills to operate and maintain a shipboard electrical system safely.

Module 2

Naval Architecture and Ship Construction

The module provides an understanding of the principles that maintain the stability of Near Coastal ships under various conditions of cargo loading and seaway.

The module also provides an understanding of the design and constructional aspects of ships with reference to effective maintenance.

Module 3

Engineering Knowledge (Motor)

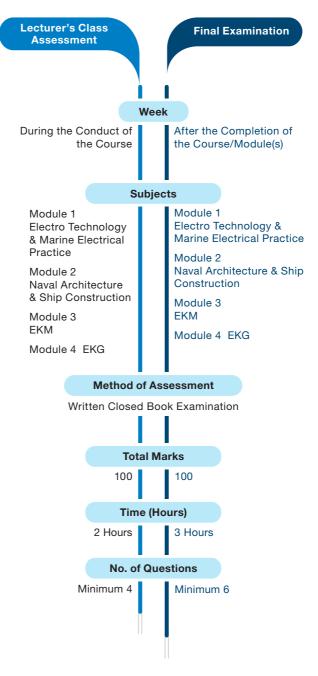
The module provides the students with the knowledge and understanding of Diesel engines, Boilers and associated systems. It also provides the students with the ability to operate, monitor, manage and evaluate engine performance and capacity, maintains the safety of equipment, systems and services.

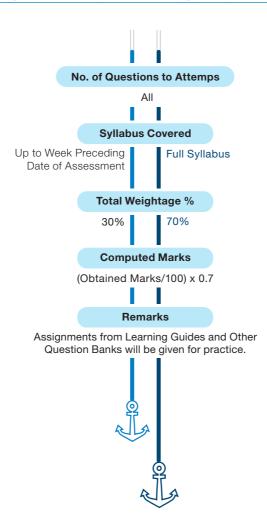
Module 4

Engineering Knowledge (General)

The module provides the students with the knowledge and understanding of various auxiliary systems. It also provides the students with the ability to operate, monitor, manage and evaluate engine performance and capacity, maintains the safety of equipment, systems and services.

Examination Scheme





Notes:

- 1. Passing criteria:
 - · 50% in LCA
 - · 50% in Final Examination + 50% Overall (LCA + Final)
- A final assessment by viva-voce will be conducted by Marine Department, Malaysia. Certification will be by Marine Department, Malaysia.



B Chief and Second Engineer Officer (Motor/Steam) Unlimited Voyage (ACSU)



Programme Educational Objectives (PEOs)

On completion of the course, students will have sufficient knowledge, understanding and skills with competencies required for certification of officers as laid down by the Marine Department, Malaysia. The Objectives of the Course are to prepare the student for the following Competencies:

- · Manage the operation of propulsion plant and machinery
- · Plan and schedule operations
- · Operation, surveillance, performance assessment and maintaining the safety of propulsion plant and auxiliary machinery
- · Manage fuel, lubrication and ballast operations
- · Manage the operation of electrical and electronic control equipment
- Manage troubleshooting, restoration of electrical and electronic control equipment to operating condition
- · Manage safe and effective maintenance and repair procedures
- · Detect and identify the cause of machinery malfunctions and correct faults
- · Ensure safe working practices
- · Control trim, stability and stress
- · Monitor and control compliance with legislative requirements and measures to ensure the safety of life at sea, security and protection of the marine environment
- Maintain safety and security of the vessel, crew and passengers and the operational condition of life-saving, fire-fighting and other safety systems
- · Develop emergency and damage control plans and handle emergency situations
- · Use leadership and managerial skills



Programme Learning Outcomes (PLOs)

To produce well-rounded graduates with the following outcomes:

PLO 1

Apply knowledge, understanding and proficiency of theories and principles of shipboard machinery.

PLO₂

Discover, process, interpret, analyze and predict problems related to marine engineering at operational and management level.

PLO₃

Identify and suggest possible solutions to marine engineering issues.

PLO 4

Communicate and articulate information and ideas effectively in both verbal and written forms.

PLO 5

Work effectively in a multinational ambience applying team working skills.

PLO 6

Apply values, ethics, morality and professionalism in their career pursuit.

PLO 7

Manage information and engage in lifelong learning.

PLO 8

Apply managerial and entrepreneurial skills contributing to the safety of personnel and ship.

PLO 9

Demonstrate leadership qualities.



Programme Curriculum Structure

No.	Subjects	Contact Hours
1.	Module 1 Electrical, Electronics & Control Engineering (EECE)	170
2.	Module 2 Controlling the Operation of the Ship and Care for Persons on board (NASC)	100
3.	Module 3 Marine Engineering Knowledge Motor (EKM)	121
4.	Module 4 Marine Engineering Knowledge General (EKG)	107
Total Contact Hours		498

No.	Subjects	Contact Hours
1.	Module 1 Electrical, Electronics & Control Engineering (EECE)	170
2.	Module 2 Controlling the Operation of the Ship and Care for Persons on board (NASC)	100
3.	Module 3 Marine Engineering Knowledge Steam (EKS)	113
4.	Module 4 Marine Engineering Knowledge General (EKG)	107
Tot	490	



Programme Courses Synopsis

Module 1

Electrical, Electronic and Control Engineering

The module provides students with the knowledge and skills to operate and maintain a shipboard electrical system safely.

Module 2

Naval Architecture and Ship Construction

The module provides an understanding of the principles that maintain the stability of ships under various conditions of cargo loading and seaway.

The module also provides an understanding of the design and constructional aspects of ships with reference to effective maintenance.

Module 3

Engineering Knowledge (Motor)

The module provides the students with the knowledge and understanding of Diesel engines, Boilers and associated systems. It also provides the students with the ability to operate, monitor, manage and evaluate engine performance and capacity, maintains the safety of equipment, systems and services.

Module 3

Engineering Knowledge (Steam)

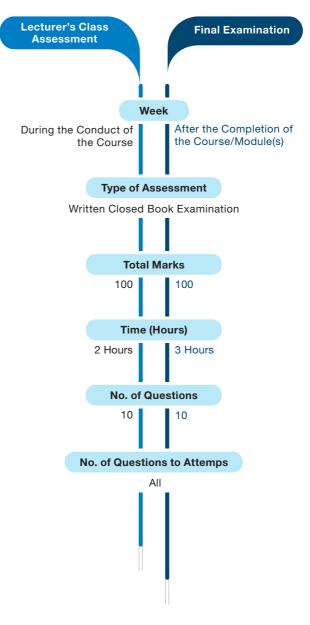
The module provides the students with the knowledge and understanding of steam turbines, boilers and associated systems. It also provides the students with the ability to operate, monitor, manage and evaluate plant performance and capacity, maintains the safety of equipment, systems and services.

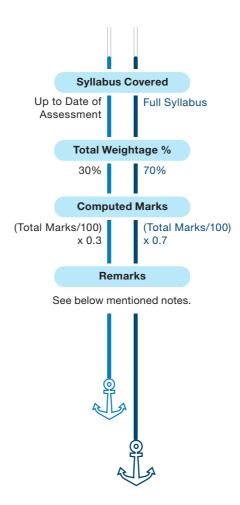
Module 4

Engineering Knowledge (General)

The module provides the students with the knowledge and understanding of various auxiliary systems. It also provides the students with the ability to operate, monitor, manage and evaluate engine performance and capacity, maintains the safety of equipment, systems and services.

Examination Scheme





Notes:

- 1. Passing criteria:
 - · 50% in LCA
 - · 50% in Final Examination + 50% Overall (LCA + Final)
- 2. A final assessment by viva-voce will be conducted by Marine Department, Malaysia. Certification will be by Marine Department, Malaysia.



C Advanced Diploma in Marine Engineering (ADME)



Programme Educational Objectives (PEOs)

PEO 1

The ADME programme aims to produce a marine engineer who leads and engages teams in problem-solving tasks through analytical thinking and effective communicative abilities.

PEO 2

The ADME programme aims to produce a marine engineer who continues to advance the knowledge and competencies to explore future developments in the maritime industry.

PEO 3

The ADME programme aims to produce a marine engineer who engages in the safe operation of the ship, ensuring conformance to regulatory requirements with the use of ICT and modern tools.



Programme Outcomes (POs)

PLO 1

The student will be able to describe advanced and comprehensive theoretical and technical knowledge in the field of Marine Engineering.

PLO₂

The student will be able to apply critical, analytical, and evaluation skills to resolve innovative solutions in the field of Marine Engineering.

PLO₃

The student will be able to perform tasks, duties and responsibilities, including related practices and procedures in the field of Marine Engineering.

PLO 4

The student will be able to work together with different people locally and internationally in diverse learning and working communities in the field of Marine Engineering.

PLO 5

The student will be able to relate ideas both in written or oral forms using a different appropriate form of presentation confidently, accurately and coherently in the appropriate context in a well-structured manner to a diversity of audience.

PLO 6

The student will be able to use a broad range of information, media and technology applications to support the study of Marine Engineering.

PLO 7

The student will be able to solve problems in Marine Engineering by combining numerical and graphical data.

PLO 8

The student will be able to work autonomously and demonstrate decision-making capacity, accountabilities, leadership and professionalism within the organization related to the maritime industry.

PLO₉

The student will be able to integrate effectively in self-directed lifelong learning and professional pathways.

PLO 10

The student will be able to demonstrate entrepreneurial competency and appreciation of broader social-political, economic and cultural issues at local and regional levels.

PLO 11

The student will be able to identify ethical issues, make decisions ethically, and act professionally within the varied social and professional environment and practices, as well as local and global issues related to the maritime industry and environmental issues.



Programme Curriculum Structure (by semester)

Semester 1

No.	Code	Subjects	Credit Hours
1.	AEA 1218	Electrical, Electronics & Control Engineering	8
2.	AEA 1226	Naval Architecture and Ship Construction	6
3.	AEA 1117	Engineering Principle	7
Total Contact Hours			21

Semester 2

No.	Code	Subjects	Credit Hours
1.	AEA 1236/ AEA 1246	Engineering Knowledge (Motor) / Engineering Knowledge (Steam)	6
2.	AEA 1256	Engineering Knowledge (General)	6
3.	AEA 1127	Engineering Mathematics	7
For Motor Total Contact Hours for Steam			19 19

Semester 3

No.	Code	Subjects	Credit Hours
1.	MPU 2163/ MPU 2133	Pengajian Malaysia/ Bahasa Melayu Komunikasi	3
2.	MPU 2223	Professional Ethics	3
3.	MPU 2312	Application of Leadership and Team Working Skills	2
4.	MPU 2412	Co-curriculum (Swimming I)	2
Total Contact Hours			10



Programme Courses Synopsis (by semester)

Module 1

Electrical, Electronics & Control Engineering (EECE)

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Module 2

Naval Architecture and Ship Construction

The module provides an understanding of the principles that maintain the stability of ships under various conditions of cargo loading and seaway.

The module also provides an understanding of the design and constructional aspects of ships with reference to effective maintenance.

Module 3

Engineering Knowledge (Motor)

The module provides the students with the knowledge and understanding of Diesel engines, Boilers and associated systems. It also provides the students with the ability to operate, monitor, manage and evaluate engine performance and capacity, maintains the safety of equipment, systems and services.

Module 4

Engineering Knowledge (Steam)

The module provides the students with the knowledge and understanding of steam turbines, boilers and associated systems. It also provides the students with the ability to operate, monitor, manage and evaluate plant performance and capacity, maintain the safety of equipment, systems and services.

Module 5

Engineering Knowledge (General)

The module provides the students with the knowledge and understanding of various auxiliary systems. It also provides the students with the ability to operate, monitor, manage and evaluate engine performance and capacity, maintain the safety of equipment, systems and services.

Module 6

Engineering Principle (EP)

The module provides students with an understanding of fundamental principles of fluid mechanics, solid mechanics, machine vibrations, thermodynamics and computational methods, including introduction level of finite-element method (FEM) and computational fluid dynamic (CFD).

Module 7

Engineering Mathematics (EM)

The module provides students with the underpinning knowledge of advanced engineering mathematics that is generally covered as pre-requisites in the undergraduate engineering programme to solve design and performance analysis-related problems.

Module 8

Pengajian Malaysia (PM)

Matapelajaran ini bertujuan melahirkan pelajar yang memahami peranannya dalam proses pembinaan negara bangsa dan bersemangat patriotik dalam menghadapi cabaran pembangunan.

Module 9

Bahasa Melayu Komunikasi (BMK)

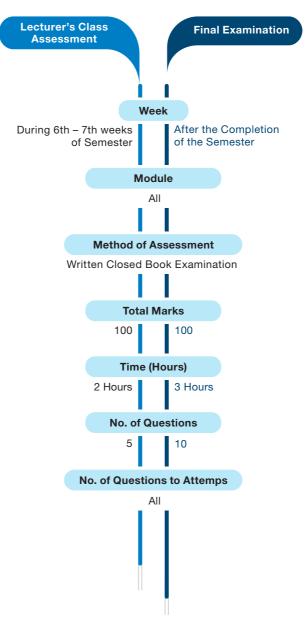
Matapelajaran ini membolehkan pelajar memahami dan menguasai kemahiran asas Bahasa Melayu dan kecekapan berbahasa untuk berkomunikasi bagi melahirkan idea dan perasaan secara lisan dan penulisan.

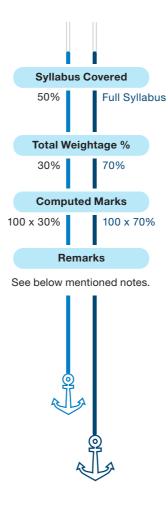
Module 10

Professional Ethics (PE)

The module enables the students to create an awareness of Engineering Ethics and Human Values, implant Moral and Social Values and Loyalty and appreciate the rights of others.

Examination Scheme





Notes:

- 1. Passing criteria:
 - · 50% in LCA
 - · 50% in Final Examination
- 2. A final assessment by viva-voce will be conducted by Marine Department, Malaysia. Certificate of competency will be issued by Marine Department.
- 3. For Practical Assessments, relevant assessment sheets will be used to evaluate skill levels and safe working practices.

