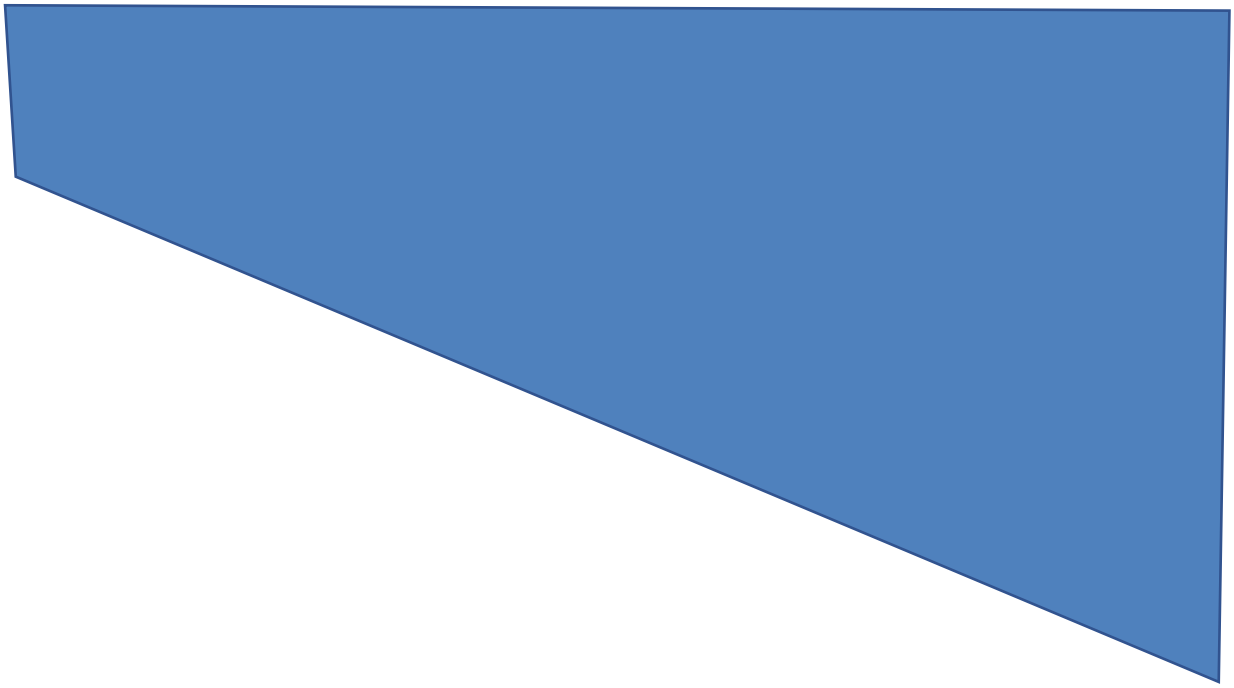

School of Mechanical Engineering (SME)

Faculty of Engineering

Bachelor of Engineering (Naval Architecture & Offshore Engineering)

ADMINISTRATION TEAM

Position	Name
Chair	Professor Dr. Mohd Hasbullah Idris hasbullah@utm.my 07-5534567
Associate Chair (Academic and Student Development)	Professor Dr. Izman Sudin izman@utm.my 07-5557051
Associate Chair (Research and Academic Staff)	Assoc. Prof. Ir. Dr. Zaini Ahmad azaini@utm.my 07-5557048
Associate Chair (Quality and Strategy)	Assoc. Prof. Dr. Haslinda Mohamed Kamar haslinda@utm.my 07-5557062
Associate Chair (Continuous Education and TNE)	Dr. Engku Mohammad Nazim Engku Abu Bakar nazim@utm.my 07-5534861
Associate Chair (Facility)	Assoc. Prof. Dr. Mohamed Ruslan Abdullah ruslanabdullah@utm.my 07-5534833
Director (Applied Mechanics & Design)	Assoc. Prof. Dr. Mohd Yazid Yahya yazidyahya@utm.my 07-5557044
Director (Aeronautics, Automotive & Ocean Engineering)	Assoc. Prof. Ir. Dr. Pakharuddin Mohd Samin pakhar@utm.my 07-5557043
Director (Materials, Manufacturing & Industrial Engineering)	Assoc. Prof. Dr. Muhamad Azizi Mat Yajid azizi@utm.my 07-5557038
Director (Thermal Fluids)	Dr. Aminuddin Saat aminuddin@utm.my 07-5557036

BACHELOR OF ENGINEERING (NAVAL ARCHITECTURE AND OFFSHORE ENGINEERING) PROGRAMME SPECIFICATIONS

1.	**Programme Name**	Bachelor of Engineering (Naval Architecture and Offshore Engineering)
2.	**Final Award**	Bachelor of Engineering (Naval Architecture and Offshore Engineering)
3.	**Awarding Institution**	Universiti Teknologi Malaysia
4.	**Teaching Institution**	Universiti Teknologi Malaysia
5.	**Professional or Statutory Body of Accreditation**	Engineering Accreditation Council (EAC)
6.	**Language(s) of Instruction**	Bahasa Melayu and English
7.	**Mode of Study (Conventional, distance learning, etc.)**	Conventional
8.	**Mode of Operation (Franchise, self-govern, etc.)**	Self-govern
9.	**Study Scheme (Full Time / Part Time)**	Full Time
10.	**Study Duration**	Minimum : 4 years Maximum : 6 years

Type of Semester	No of Semesters	No of Weeks/Semester
Normal	8	14
Short	1	8

11.	**Entry Requirements**	Matriculation/STPM/Diploma or equivalent

12. Programme Objectives (PEO)

(i) Demonstrate academic and technological excellence professionally and globally, particularly in areas related to naval architecture and offshore engineering practices and contribute innovatively to the nation's wealth creation.

(ii) Career advancement by achieving higher levels of responsibility, leadership and acquiring professional and advanced academic qualifications.

(iii) Recognize and practice professional, ethical, environmental and societal responsibilities and value different global and cultural aspects of their work and society.

(iv) Adapt and communicate effectively and be successful working with multi-disciplinary teams.

13. Programme Learning Outcomes (PLO)		
(a) Technical Knowledge and Competencies		
Intended Learning Outcomes	**Teaching and Learning Methods**	**Assessment**
PLO1		
Acquire and apply fundamental knowledge of mathematics, science and engineering principles to solve complex naval architecture and offshore engineering problems; Keywords: **Engineering knowledge**	Lectures, tutorials, laboratory works, seminars, studio works, directed reading, final year projects and problem – based learning.	Examinations, laboratory reports, seminar presentations, problem – based exercises, individual and group project reports.
PLO2		
Identify, formulate and analyse complex naval architecture and offshore engineering problems; Keywords: **Problem Analysis**	Lectures, tutorials, laboratory works, seminars, studio works, directed reading, final year projects and problem – based learning.	Examinations, laboratory reports, seminar presentations, problem – based exercises, individual and group project reports.
PLO3		
Design solutions for complex naval architecture and offshore engineering problems that fulfil health, safety, societal, cultural and environmental needs; Keywords: **Design/Development of Solutions**	Lectures, tutorials, laboratory works, seminars, studio works, directed reading, final year projects and problem-based learning.	Examinations, laboratory reports, seminar presentations, problem-based exercises, individual and group project reports.
PLO4		
Investigate complex naval architecture and offshore engineering problems using research-based knowledge and methods to produce conclusive results; Keywords: **Investigation**	Lectures, tutorials, laboratory works, seminars, studio works, directed reading, final year projects and problem-based learning.	Examinations, laboratory reports, seminar presentations, problem-based exercises, individual and group project reports

Intended Learning Outcomes	Teaching and Learning Methods	Assessment
PLO5		
Use modern engineering and information technology (IT) tools in complex naval architecture and offshore engineering activities, with an understanding of limitations; Keywords: **Modern Tools Usage**	Lectures, tutorials, laboratory works, seminars, studio works, directed reading, final year projects and problem-based learning.	Examinations, laboratory reports, seminar presentations, problem-based exercises, individual and group project reports.
(b) Generic Skills		
PLO6		
Apply professional engineering practice and solutions to complex naval architecture and offshore engineering problems related to societal, health, safety, legal and cultural issues with full responsibility and integrity; Keywords: **The Engineer and Society**	Lectures, tutorials, seminars, group projects and industrial training.	Industrial training and group project reports.
PLO7		
Evaluate the sustainability and impact of professional engineering work in the solutions of complex naval architecture and offshore engineering problems in societal and environmental contexts. Keywords: **Environment and Sustainability**	Tutorials, laboratory works, group assignments and projects, final year project presentations and problem-based learning.	Group reports, learning logs/diaries and oral presentations.
PLO8		
Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice; Keywords: **Ethics**	Lectures, tutorials, seminars, group projects and industrial training.	Industrial training and group project reports.

Intended Learning Outcomes	Teaching and Learning Methods	Assessment
PLO9		
Communicate effectively on complex naval architecture and offshore engineering activities both orally and in writing; Keywords: **Communication**	Seminars, assignments and final year projects.	Report and theses.
PLO10		
Work productively as an individual, and as a member or leader in a team that may involve multi-disciplinary settings; Keywords: **Team Working**	Lectures and project assignments.	Demonstrations, reports, tests, examinations and presentations.
PLO11		
Undertake life long learning and manage information including conducting literature study; Keywords: **Life Long Learning**	Lectures and project assignments.	Demonstrations, reports, tests, examinations and presentations.
PLO12		
Demonstrate and apply knowledge on finance and management principles and acquire entrepreneurship skill; Keywords: **Project Management, Finance & Entrepreneurship**	Lectures and project assignments.	Demonstrations, reports, tests, examinations and presentations.

14. Classification of Courses			
No.	**Classification**	**Credit Hours**	**Percentage**
i.	School Core Courses	62	44.3
ii.	Programme Core Courses	51	36.4
iii.	Programme Elective Courses	4	2.9
iv.	University Courses	23	16.4
Total		**140**	**100**
Classification of courses for engineering programme			
A	Engineering Courses	117	85
	Total credit hours for Part A	**117**	
B	Non – Engineering Courses	23	15
	Total credit hours for Part B	**23**	
Total credit hours for Part A and B		**140**	**100**
15. Total Credit Hours to Graduate		**138**	

Award Requirements

To graduate, students must:

- Attain a total of not less than 140 credit hours with a minimum CGPA of 2.00.
- Has passed all specified courses.
- Has applied for graduation and has been approved by the University.
- Has completed all four (4) short courses and one (1) test in UTM Professional Skills Certificate Programme.
- Other condition as specified.

Entry Requirements

The minimum qualifications for candidates who intend to do a Bachelor of Engineering (Naval Architecture & Offshore Engineering) are as follows:

1. Minimum results based on **the Malaysian High School Certificate (STPM)** (results would be based on the general requirements as well as other conditions as the pre-requisites for the programme set by the university).

University General Requirements:

i. Passed Malaysian Certificate Examination (SPM) or its equivalent with a credit in Bahasa Melayu/Bahasa Malaysia or a credit in Bahasa Melayu/Bahasa Malaysia, July Paper.

ii. Passed the Malaysian High School Certificate (STPM) or its equivalent and obtained the following:

   a) **Grade C (NGMP 2.00)** General Studies/General Paper, and

   b) **Grade C (NGMP 2.00)** in two (2) other subjects

iii. Passed the Malaysian University English Test (MUET) with minimum result of **Band 1**.

Programme Specific Requirements

i. Obtained a **CGPA of 2.80**; and Passed with a minimum **Grade B- (NGMP 2.67)** in two (2) of the following subjects:

   a) Mathematics T / Further Mathematics

   b) Physics or Chemistry

ii. Passed with at least a **Grade C** in Mathematics and Physics in the SPM level or equivalent.

iii. Passed the Malaysian University English Test (MUET) with minimum result of **Band 2**.

iv. Do not have any health problems that may affect their studies.

2. Minimum requirements for **Matriculation Certificates (KPM) / UM Science Foundation / UiTM Foundation** (fulfil the general requirements set by the university as well as other conditions of the programme).

General University Requirements

i. Passed Malaysian Certificate Examination (SPM) or its equivalent with a credit in Bahasa Melayu/Bahasa Malaysia or a credit in Bahasa Melayu/Bahasa Malaysia, July Paper.

ii. Passed the Matriculation Certificates (KPM) / UM Science Foundation / UiTM Foundation with a minimum **CGPA of 2.00** and passed all the core subjects.

iii. Passed the Malaysian University English Test (MUET) with minimum result of **Band 1**.

Programme Specific Requirements

i. Obtained a **CGPA of 2.80**; and Passed with a **Grade B- (2.67)** in two (2) of the following subjects:

   a) Mathematics / Engineering Mathematics

   b) Physics / Engineering Physics or Chemistry / Engineering Chemistry

ii. Passed with at least a **Grade C** in Mathematics and Physics in the SPM level or equivalent.

iii. Passed the Malaysian University English Test (MUET) with minimum result of **Band 2**.

iv. Do not have any health problems that may affect their studies.

3. Minimu**m** qualifications for students with **Certificates/Diplomas** (fulfil the general requirements set by the university as well as specific requirements of the programme).

General University Requirements

i. Obtained a Diploma or equivalent qualification recognised by the Malaysian Government and approved by the Senate.

or

ii. Passed STPM examination in 2016 or before and obtained at least:

   a) **Grade C (NGMP 2.00)** General Studies/General Paper, and

   b) **Grade C (NGMP 2.00)** in two (2) other subjects

or

iii. Passed the Matriculation Certificates (KPM) / UM Science Foundation / UiTM Foundation in 2017 or before and obtained minimum **CGPA of 2.00.**

iv. Passed the Malaysian University English Test (MUET) with minimum result of **Band 1**.

v. Passed Malaysian Certificate Examination (SPM) or its equivalent with a credit in Bahasa Melayu/Bahasa Malaysia or a credit in Bahasa Melayu/Bahasa Malaysia, July Paper.

Programme Specific Requirements

i. Obtained a Diploma in Mechanical Engineering from UTM or equivalent with minimum **CGPA of 2.75**.

or

ii. For those who obtained a **CGPA of less than 2.75** but have at least **two (2)** years working experience in related field are eligible to apply.

or

iii. Meet the minimum entry requirements as required for STPM holders.

or

iv. Meet the minimum entry requirements as required for those who have completed the Matriculation Certificates (KPM) / UM Science Foundation / UiTM Foundation.

v. Passed with at least a **Grade C** in Mathematics and Physics in the SPM level or equivalent.

or

vi. Obtained at least a **C Grade (2.00)** in any one of the Mathematic courses at Diploma level.

v. Passed the Malaysian University English Test (MUET) with minimum result of **Band 2**.

vii. Do not have any health problems that may affect their studies.

Note:
Candidates are required to submit the results transcript of all their examinations taken during their Diploma study (semester one until the final semester) to UTM. A copy of the diploma or a letter of completion of study will also have to be submitted together with their applications.

Year of entry and duration of study will be based on the credit exemptions approved by the UTM.

PROFESSIONAL SKILLS CERTIFICATE (PSC)

Students are required to enrol in certificate programmes offered by the Centres of Excellence in the University and the School of Professional and Continuing Education (SPACE) during the duration of their studies in UTM. The four (4) short courses and one test are as follows:

1. How to Get Yourself Employed (HTGYE)
2. ISO 9001: 2008 Quality Management System Requirement (ISO)
3. Occupational Safety and Health Awareness (OSHA)
4. How to Manage Your Personal Finance (HTMYPF)
5. Test of English Communication Skills for Graduating Students (TECS):
   (i) TECS 1001 (Paper I – Oral Interaction)
   (ii) TECS 1002 (Paper II - Writing)

MOBILITY PROGRAMME (OUTBOUND)

Universiti Teknologi Malaysia (UTM) is offering five (5) types of mobility programs which allow UTM Student to go abroad and join academic programs in universities, institutions or organizations in all over the world. The opportunities offered are as below:

1. Study Abroad / Student Exchange

Study Abroad/Student Exchange programme is a programme which allow student to spend one or two semesters at universities abroad and take courses in regular semester with credit transfer opportunity.

2. Research Internship Abroad

Research Internship is a program which allow student to join research study or internship under the supervision of an academic staff at universities or industries abroad from all over the world.

3. Global Outreach Programme (GOP)

GOP is a 7 to 14 days academic based program to experience various cultures in other countries. It includes immersion elements such as research & academic activities, social responsibility and cross cultural activities.

4. International Invitation Programme

Students participate in program organised by international institutions/ organisations with the following themes:

(i) Seminar, Conference or Paper Presentation
(ii) Cultural Exhibition and Conference
(iii) Student Development Activity

5. Summer School Abroad

Summer School program is a program which is designed to provide educational opportunities in 4 to 8 weeks during summer holiday abroad. It is related to environment, local community, heritage and tradition.

Details and appropriate forms and procedures can be reached at **UTM International link: http://www.utm.my/international/outbound-mobility-programs/**

COURSE MENU

YEAR 1 : SEMESTER 1						
CODE	**COURSE**	**L**	**T**	**P/S**	**CREDIT**	**PRE-REQUISITE**
SKMM 1203	Statics*	3	1	0	3	
SKMM 1503	Engineering Drawing	1	0	6	3	
SKMM 1912	Experimental Methods	2	0	3	2	
SKMO 1922	Introduction to Naval Architecture and Offshore Engineering	0	0	3	2	
SKEU 1002	Electrical Technology	2	1	0	2	
SSCE 1693	Engineering Mathematics I	3	1	0	3	
ULAB 1122	Academic English Skills	3	0	0	2	
		Total			**17**	

YEAR 1 : SEMESTER 2						
CODE	**COURSE**	**L**	**T**	**P/S**	**CREDIT**	**PRE-REQUISITE**
SKMM 1013	Programming for Engineers	3	0	0	3	
SKMM 1113	Mechanics of Solids I*	3	1	0	3	SKMM 1203
SKMM 1213	Dynamics*	3	1	0	3	SKMM 1203
SKMM 1512	Introduction to Design	1	0	3	2	SKMM 1503
SSCE 1793	Differential Equations	3	1	0	3	SSCE 1693
UICI 1012/ ULAM 1012	Islamic and Asian Civilization/ Malay Language for Communication 2#	2	0	0	2	
		Total			**16**	

YEAR 2 : SEMESTER 1						
CODE	**COURSE**	**L**	**T**	**P/S**	**CREDIT**	**PRE-REQUISITE**
SKMM 2613	Materials Science	3	1	0	3	
SKMM 2313	Mechanics of Fluids I*	3	1	0	3	SKMM 1203
SKMM 2413	Thermodynamics*	3	1	0	3	
SKMM 2921	Laboratory I	0	0	2	1	SKMM 1912
SSCE 1993	Engineering Mathematics II	3	1	0	3	SSCE 1693
ULAB 2122	Advanced Academic English Skills	3	0	0	2	ULAB 1122
UHAS 1172/ UHAK 1022	Malaysian Dynamics/ Malaysian Studies 3#	2	0	0	2	
		Total			**17**	

YEAR 2 : SEMESTER 2						
CODE	**COURSE**	**L**	**T**	**P/S**	**CREDIT**	**PRE-REQUISITE**
SKMM 2223	Mechanics of Machines and Vibration*	3	1	0	3	SKMM 1213
SKMO 2123	Ship and Offshore Structures I	3	1	0	3	SKMM 1113
SKMO 2322	Naval Architecture I	1	0	3	2	
SKMO 2343	Marine Hydrodynamics	3	1	0	3	SKMM 2313
SKEU 2012	Electronics	2	0	0	2	SKEU 1002
SSCE 2193	Engineering Statistics	3	1	0	3	
		Total			**16**	

YEAR 3 : SEMESTER 1						
CODE	**COURSE**	**L**	**T**	**P/S**	**CREDIT**	**PRE-REQUISITE**
SKMM 3023	Applied Numerical Methods	3	0	0	3	SKMM 1013 SSCE 1793
SKMM 3931	Laboratory II	0	0	3	1	SKMM 2921
SKMO 3333	Naval Architecture II	3	1	0	3	SKMO 2322
SKMO 3353	Ship Resistance and Propulsion	3	1	0	3	SKMM 2313
SKMO 3713	Ship and Offshore Production Technology	3	0	0	3	
UHAK 1012	Graduate Success Attributes	2	0	0	2	
UHAK 1032	Introduction to Entrepreneurship	2	0	0	2	
		Total			**17**	

YEAR 3 : SEMESTER 2						
CODE	**COURSE**	**L**	**T**	**P/S**	**CREDIT**	**PRE-REQUISITE**
SKMM 3033	Finite Element Methods	3	0	0	3	SKMM 1113**
SKMM 3242	Instrumentation	2	0	0	2	SKEU 2012**
SKMM 3623	Materials Engineering	3	0	0	3	SKMM 2613
SKMO 3133	Ship and Offshore Structure II	3	1	0	3	SKMO 2123**
SKMO 3523	Ship and Offshore Design I	2	0	3	3	SKMO 3333** SKMO 3353**
SKMO 3812	Marine Transport and Economics	2	0	0	2	
ULAB 3162	English for Professional Purposes	3	0	2	2	ULAB 1122 ULAB 2122
		Total			**18**	

SHORT SEMESTER						
CODE	**COURSE**	**L**	**T**	**P/S**	**CREDIT**	**PRE-REQUISITE**
SKMO 3915	Industrial Training				5	##, SKMO 2123**, SKMM 2223**
		Total			**5**	

YEAR 4 : SEMESTER 1						
CODE	**COURSE**	**L**	**T**	**P/S**	**CREDIT**	**PRE-REQUISITE**
SKMO 4233	Dynamics of Marine Vehicles	3	0	0	3	SKMM 2223 SKMO 2343
SKMO 4422	Marine and Offshore Engineering System	2	0	0	2	SKMM 2413
SKMO 4533	Ship and Offshore Design II	2	0	3	3	SKMO 3523
SKMO 4912	Undergraduate Project I	0	0	6	2	SKMM 2223** SKMO 2123**
SKMO 4941	Marine Laboratory I	0	0	3	1	SKMO 3333** SKMO 3353**
SKMO 4xx2	Marine and Offshore Elective I	2	0	0	2	
UICL 2302	Thinking of Science and Technology	2	0	0	2	
UHAK 2XX2/ UICL 2XX2	Elective Cluster 2@3	2	0	0	2	
		Total			**17**	

YEAR 4 : SEMESTER 2						
CODE	**COURSE**	**L**	**T**	**P/S**	**CREDIT**	**PRE-REQUISITE**
SKMM 4902	Engineering Professional Practice	0	0	2	2	Must be at least 3rd year
SKMO 4924	Undergraduate Project II	0	0	12	4	SKMO 4912
SKMO 4823	Marine Management, Safety and Environment	3	0	0	3	
SKMO 4951	Marine Laboratory II	0	0	3	1	SKMO 4233**
SKMO 4yy2	Marine and Offshore Elective II	3	0	0	2	
ULAX 1112	Language Skills Elective (Foreign Language)	2	0	0	2	
UKQE 3001	Extra Curricular Experiential Learning (ExCel)	0	0	3	1	
UKQX xxx2	Co-curriculum and Service Learning Elective	0	0	3	2	Completed three extracurricular experience programmes
		Total			**17**	

Subject to changes:

* Core Courses – minimum passing grade is C (50%)
# University general course for international student only, international students are not required to take UICI 1012 (semester 1) and UHAS 1172 (semester 2).
** Minimum grade D- (30%) in the pre-requisite courses
Obtained minimum of 80 credits

Notes: L – Lecture, T – Tutorial, P/S – Practical/Studio

ELECTIVE COURSES
Choose one (1) from each elective group (Elective I and Elective II):

Elective I

SKMO 4012 Marine Meteorology and Oceonography
SKMO 4132 Marine Control Engineering
SKMO 4142 Reliability of Ship and Offshore Structures

Elective II

SKMO 4152 Platform, Pipeline and Sub-Sea Technology
SKMO 4262 Risers and Mooring Dynamics
SKMO 4452 Marine Engineering System Project

GRADUATION CHECKLIST

To graduate, students must pass all the stated courses in this checklist. It is the responsibility of the students to ensure that all courses are taken and passed. Students who do not complete any of the course are not allowed to graduate.

NO	COURSE CODE	COURSE NAME	CREDIT EARNED (JKD)	CREDIT COUNTED (JKK)	TICK (/) IF PASSED
MECHANICAL ENGINEERING COURSES					
1	SKMM 1013	Programming for Engineers	3	3	
2	SKMM 1113	Mechanics of Solids I	3	3	
3	SKMM 1203	Statics	3	3	
4	SKMM 1213	Dynamics	3	3	
5	SKMM 1503	Engineering Drawing	3	3	
6	SKMM 1512	Introduction to Design	2	2	
7	SKMO 1922	Introduction to Naval Architecture & Offshore Engineering	2	2	
8	SKMM 1912	Experimental Methods	2	2	
9	SKMM 2223	Mechanics of Machines & Vibration	3	3	
10	SKMM 2313	Mechanics of Fluids I	3	3	
11	SKMM 2413	Thermodynamics	3	3	
12	SKMM 2613	Materials Science	3	3	
13	SKMM 2921	Laboratory I	1	1	
14	SKMM 3023	Applied Numerical Methods	3	3	
15	SKMM 3033	Finite Element Methods	3	3	
16	SKMM 3242	Instrumentation	2	2	
17	SKMM 3623	Materials Engineering	3	3	
18	SKMM 3931	Laboratory II	1	1	
19	SKMM 4902	Engineering Professional Practice	2	2	
20	SKMO 2123	Ship & Offshore Structures I	3	3	
21	SKMO 2322	Naval Architecture I	2	2	
22	SKMO 2343	Marine Hydrodynamics	3	3	
23	SKMO 3133	Ship & Offshore Structures II	3	3	
24	SKMO 3333	Naval Architecture II	3	3	

25	SKMO 3353	Ship Resistance & Propulsion	3	3	
26	SKMO 3523	Ship & Offshore Design I	3	3	
27	SKMO 3713	Ship & Offshore Production Technology	3	3	
28	SKMO 3812	Marine Transport & Economics	2	2	
29	SKMO 3915	Industrial Training	5	HL	
30	SKMO 4233	Dynamics of Marine Vehicles	3	3	
31	SKMO 4422	Marine & Offshore Engineering System	2	2	
32	SKMO 4533	Ship & Offshore Design II	3	3	
33	SKMO 4823	Marine Management, Safety & Environment	3	3	
34	SKMO 4912	Undergraduate Project I	2	2	
35	SKMO 4924	Undergraduate Project II	4	4	
36	SKMO 4941	Marine Laboratory I	1	1	
37	SKMO 4951	Marine Laboratory II	1	1	
38	SKMO 4xx2	Elective I	2	2	
39	SKMO 4yy2	Elective II	2	2	
		TOTAL CREDIT FOR MECHANICAL ENGINEERING COURSES (A)	**101**	**96**	
ELECTRICAL COURSES (School of Electrical Engineering)					
1	SKEU 1002	Electrical Technology	2	2	
2	SKEU 2012	Electronics	2	2	
		TOTAL CREDIT FOR ELECTRICAL COURSES (B)	**4**	**4**	
MATHEMATICS COURSES (Faculty of Science)					
1	SSCE 1693	Engineering Mathematics I	3	3	
2	SSCE 1793	Differential Equations	3	3	
3	SSCE 1993	Engineering Mathematics II	3	3	
4	SSCE 2193	Engineering Statistics	3	3	
		TOTAL CREDIT FOR MATHEMATICS COURSES (C)	**12**	**12**	

UNIVERSITY GENERAL COURSES					
CLUSTER 1: APPRECIATION OF PHILOSOPHY, VALUE & HISTORY					
1	UICI 1012	Islamic & Asian Civilization (for local students only)	2	2	
	UHAK 1022	Malaysian Studies 3 (for international students only)			
2	UHAS 1172	Malaysian Dynamics (for local students only)	2	2	
	ULAM 1012	Malay Language for Communication 2 (for international students only)			
CLUSTER 2: GENERIC SKILLS					
1	UHAK 1012	Graduate Success Attributes	2	2	
2	UHAK 2xx2	Generic Skills Elective #	2	2	
CLUSTER 3: KNOWLEDGE EXPANSION					
1	UICL 2302	Thinking of Science & Technology	2	2	
2	UICL 2xx2	Knowledge Expansion Elective #	2	2	
CLUSTER 4: CO-CURRICULUM & SERVICE LEARNING					
1	UKQX xxx2	Co-curriculum & Service Learning Elective	2	2	
2	UKQE 3001	Extra Curricular Experiential Learning	1	1	
CLUSTER 5: LANGUAGE SKILLS					
1	ULAB 1122	Academic English Skills	2	2	
2	ULAB 2122	Advanced Academic English Skills	2	2	
3	ULAB 3162	English for professional Purposes	2	2	
4	ULAX 1112	Language Skills Elective (Foreign Language)	2	2	
CLUSTER 6: ENTREPRENEURSHIP					
1	UHAK 1032	Introduction to Entrepreneurship	2	2	
		TOTAL CREDIT FOR UNIVERSITY GENERAL COURSES (D)	**23**	**23**	
		TOTAL CREDIT TO GRADUATE (A + B + C + D)	**140**	**135**	
Note: # Choose either UHAK 2xx2 or UICL 2xx2					

OTHER COMPULSORY COURSES			
PROFESSIONAL SKILLS CERTIFICATE (PSC)			
1	GLL 1001	How To Get Yourself Employed	
2	GLL 1029	ISO 9001:2008 Quality Management System Requirement	
3	GLL 1040	Occupational Safety, Health and Environment	
4	GLL 1041	How to Manage Your Personal Finance	
5	Test of English Communication Skills (TECS)		
	TECS 1001	Oral Interaction	
	TECS 1002	Writing	

COURSE SYNOPSIS FOR B. ENG (NAVAL ARCHITECTURE AND OFFSHORE ENGINEERING)

SKMM 1013 Programming for Engineers

This course formally introduces the concept of computers, algorithms, programming languages, pseudo-code, and design of programs for solution to computational engineering problems. The two programming languages introduced in this course are C and MATLAB. Topics covered in this course include data types, constants, variables, arithmetic operations, assignment statement, looping, formatted I/O, functions, arrays, matrix operations, data structures, plotting and model building.

SKMM 1113 Mechanics of Solids I

The course provides students with the knowledge to determine the strength and stiffness of engineering structures being used. The structures that will be used in this course are bars, pins, bolts, shafts and beams and the types of applied loadings are axial forces, deformations due to the change in temperature, torsional loads, transverse loads and combination of these loads. At the end of the course, students should be able to determine the mechanical properties of the materials with respect to their strength and stiffness. Students should be able to calculate stresses, strains and deformations in structures due to various types of loading conditions. In addition, they should be able to solve problems related to statically determinate and indeterminate structures.

SKMM 1203 Statics

This course introduces students to the part of mechanic which is a pre-requisite for most engineering courses including SKMM 1213, SKMM 2313 and SKMM 1113. The course enables student to acquire the essential basic knowledge of resultant and equilibrium of forces. It will examine key elements in producing free body diagrams for particles and rigid bodies, as essential first step in solving applied mechanics problems. Exposure to the concept of moment and equilibrium equations with reference of Newton's Law enhances the relevance of friction, trusses, frames and machines applications. Students are also introduced to the concept of distributed forces, which include centroid and centre of gravity and the generated surface area and volume of revolution. Hence, students will be able to demonstrate and apply the knowledge in continuing subjects which requires the analytical skills developed in this subject.

SKMM 1213 Dynamics

The course is an extension to SKMM 1203, which is the pre-requisite to this course. It introduces students to the part of mechanics which considers the action of forces in producing motion. This course provides an exposure to students on the theory of the kinetics and kinematics of particles and rigid bodies. The concepts of energy, work, momentum and impulse are also introduced. At the end of the course students should be able to apply the principles to study and analyse the behaviour and responses of dynamical systems. They should also be able to solve the dynamic problems related to the determination of forces energy and power to move a body.

SKMM 1503 Engineering Drawing

This subject introduces student to the use of technical drawing in an effective way for communicating and integrating with engineering concepts. Such environment will provide a platform where the engineer can share and exchange information. This subject will also enlighten the student on the significant changes in the engineering and technical graphic due to the use of computer and CAD (Computer Aided Design) software. At the end of the course, student should be able to apply the skill and knowledge of engineering drawing to interpret design, using graphics method such as geometric drawing, orthographic projection, isometric, machine drawing, detailed drawing, and basic CAD software.

SKMM 1512 Introduction to Design

This course is designed to expose students to the concepts and methods to develop an efficient process and apply it to solve engineering design problems creatively and effectively.

SKMO 1922 Introduction to Naval Architecture and Offshore Engineering

The course comprises two parts intended to introduce students to the field of naval architecture and offshore engineering. The first part raises the students' awareness on the importance and necessity in developing systematic approach for solving naval architecture and offshore engineering problems. It introduces the importance of some generic skills to naval architects and offshore engineers. It also provides students an overview of the different fields within naval architecture and offshore engineering and a description of the naval architects and offshore engineer's work and professional responsibilities. The second part aims to expose students to the hands-on nature of basic engineering workshop skills.

SKMM 1912 Experimental Methods

This course is conducted through lectures and experiments. For the first seven weeks, students are exposed to the experimental method theory followed by laboratory works for the next seven weeks. The lecture shall cover the fundamental of experimental method and the basic principles in measurements, instrumentation and analysis of results. It shall focus on the design of mechanical experiments, selection of sensors and transducers, estimation of errors and display of results. It shall also cover the analysis of results and proper report writing. Student comprehension will be tested in two written examinations. During the practical sessions, several groups of 5 – 6 students will be formed to conduct several experiments. The students are expected to apply the theories thought earlier in the first part of the semester in designing experiments, recording data and displaying results. The students will also conduct statistical analysis of results and present the experimental outcome in a report.

SKMM 2223 Mechanics of Machines and Vibration

The course requires SKMM 1213 as the pre-requisite. It is designed to expose students to the application of concepts in mechanics (statics and dynamics) to solve real world mechanical engineering problems pertaining to various machines which include belt and pulley systems, gears, flywheels, governors and gyroscopes. Students will also be exposed to the methods of balancing rotating masses and parts of a combustion engine. The

concept of vibration with respect to one-degree-freedom is also studied. At the end of the course, the students should be able to solve problems related to various mechanical systems. In addition, they should be able to evaluate analytically the parameters of components of various machines under study.

SKMM 2313 Mechanics of Fluids I

The principle aim of this course is to provide students with an understanding of the properties of fluids and to introduce fundamental laws and description of fluid behaviour and flow. It will emphasize on the concept of pressure, hydrostatic pressure equation and its application in the measurement of pressure, static force due to immersed surfaces, floatation and buoyancy analysis. Dynamic flow analysis inclusive of technique in solving flow problems is introduce especially to solve flow measurement, mass or volumetric flow rate, momentum in flow and loss in pipe network. Lastly, some basic dimensional analysis and similarities will be introduced. At the end of the course, the student should be able to demonstrate an ability to analyze whether statically, dynamically or kinematically problems related directly to fluids.

SKMM 2413 Thermodynamics

Thermodynamics is a basic science that deals with energy. This course introduces students to the basic principles of thermodynamics. It will discuss basic concepts and introduces the various forms of energy and energy transfer as well as properties of pure substances. A general relation for the conservation of energy principle expressed in the First Law of Thermodynamics will be developed and applied to closed systems and extended to open systems. The second law of thermodynamics will be introduced and applied to cycles, cyclic devices and processes.

SKMM 2613 Materials Science

This course introduces students to the fundamentals of materials science and engineering with emphasis on atomic bonding, crystal structures and defects in metals. It will introduce students to the various classes of materials including metals, ceramics, polymers and composites and their fundamental structures. The course will also provide basic diffusion mechanisms, metal solidification phase diagrams and heat treatment processes. At the end of the course, students should be able to apply the knowledge of atomic bonding and crystal structures to predict the physical and mechanical behaviour of materials, and use the principles of phase diagrams and heat treatments to the design of materials and their properties.

SKMM 2921 Laboratory I

This course is introduced in the second year of the Mechanical Engineering programme involving two hours per week session and experimental based courses. It consists of six laboratories; Strengths of Materials Laboratory, Materials Science Laboratory, Mechanics of Machines Laboratory, Electrical Laboratory and Fluid Laboratory. Students will be grouped into 5 to 6 people for each experiment. It is based on the theories that have been learned in the particular courses at the same semester. In general, every student has to carry out a total of twelve experiments. At the end of the session, students have to submit a report for each experiment and will be evaluated based on this report.

SKMM 3023 Applied Numerical Methods

This course formally introduces the steps involved in engineering analysis (mathematical modelling, solving the governing equation, and interpretation of the results). Examples of case studies in applied mechanics, strength of materials, thermal science, and fluid mechanics are presented. Methods for solving the nonlinear equations, simultaneous linear algebraic equations, eigenvalue problem, interpolation, numerical differentiation, numerical integration, initial value problems, boundary value problem and partial differential equation are introduced.

SKMM 3033 Finite Element Methods
This course gives students an exposure to the theoretical basis of the finite element method and its implementation principles, and introduces the use of general purpose finite element software for solving real-life engineering problems.

SKMM 3623 Materials Engineering
This course is designed to introduce students to the concept of fracture mechanics and how engineering materials respond to mechanical loads. The failure behaviour of engineering materials will cover fracture, fatigue, creep, wear and corrosion. The course will also provide students with knowledge of how to conduct failure analysis and determine the root cause of failure under different mechanical loading. The mechanical behaviour of polymeric materials, ceramics and composites will also be covered as well examples of case studies of selecting engineering materials for specific product designs.

SKMM 3915 Industrial Training
Industrial training exposes students to the real work setting in various industries for 12 weeks. The students are placed in industries that best suit their area of studies. It is an experiential learning that requires the students to learn the process and able to apply their knowledge acquired in class in actual industrial setting. The knowledge acquired during practical training may be used later in final year classes as well as to equip them with sufficient knowledge for job interviews.

SKMM 3931 Laboratory II
This course is introduced in the third year of Mechanical Engineering programme involving two hours per week and experimental based courses. It consists of six laboratories; Strength of Materials Laboratory, Thermodynamics Laboratory, Materials Science Laboratory, Mechanics of Machines Laboratory, Electrical Laboratory and Fluids Laboratory. Students will be grouped into 5 to 6 for each experiment. It is based on the theory learned in the particular courses at the same semester. In total, every student have to carry out twelve experiments. At the end of the session, students have to submit a report for each experiment and will be evaluated based on this report.

SKMM 4902 Engineering Professional Practice
This course introduces students to engineering ethics and an engineer's responsibilities towards safety, health and welfare of the public. It emphasizes on the engineer as a professional man, engineers & society, code of ethics and professional conduct, standards, laws and regulations pertaining to professional engineering practice. The course will also introduce students to organize, in a group, community service activities in a planned and structured manner. At the end of the course, students should be able to demonstrate and apply engineering professional ethics in their career as an engineer.

SKMM 4912 Undergraduate Project I
This course introduces the final year students on how to do academic research on their own by applying knowledge and skills they acquired from other courses. Given a topic on a project, students have to identify a problem, gather relevant information to the problem and propose solutions to problems. In this course, students have to do some literature surveys in order to understand the nature of the problem and investigate work done by other researchers in line with their work. The students are also required to propose a methodology on how to solve the problems. By the end of this course, the students are expected to submit and present their research proposal to be assessed by their supervisors and panel of assessors.

SKMM 4924 Undergraduate Project II
This course is the continuation of Undergraduate Project (UGP) I. It enhances the students'

knowledge and ability to identify and solve problems through academic research. It will provide an exercise for the student in carrying out research with minimum supervision and the ability to plan and manage their work effectively. This course will also develop the students' capability to present, discuss and analyze results of the research clearly, effectively and confidently in both oral presentation and in dissertation.

SKMO 2123 Ship and Offshore Structure I
This course is concerned with the knowledge on loading and stresses of ship and offshore structure. It begins with the components and functions on ship and offshore structures. The floating hull loading, shear forces and bending moments are then in detail discussed. The important structural strength analysis for ship and offshore structures will be highlighted on bending and buckling afterward.

SKMO 2322 Naval Architecture I
This course introduces students to basic naval architectural knowledge. It enables students to familiarize themselves with naval architectural terms, ship components, and undertakes simple hydrostatics and stability calculations. Tools and techniques required in future naval architecture work are introduced here. The course includes hands-on individual and group projects.

SKMO 2343 Marine Hydrodynamics
Basic knowledge of marine hydrodynamics theory and CFD software are introduced. Enhancement of Knowledge in Mechanics of Fluids I started with some discussion on motion of Viscous/Real fluid and an Ideal fluid. Further discussion are also given in surface waves and hydrodynamic of slender bodies

SKMO 3133 Ship and Offshore Structure II
This course is divided into three main areas, namely ship/platform topside vibration, finite element methods and underwater structural failure. In the vibration it starts with introduction to the structural vibration, free vibration and forced vibration. It is then followed by the vibration calculation in ships and platform topside structure. Method of determining vibration characteristics and reducing vibration are given for design practices. FEM covers the analysis of statically indeterminate structure by the direct stiffness method of truss, beam and plane frames. The students are also required to carry out building frame project using FEM software. In the underwater structural failure, it reviews the various modes of structural failure and highlights the importance of fracture induced failure and contrasts it with the limited coverage given to fracture mechanics in underwater. This section will discuss some examples of well-known failures/accidents attributed to cracking. Then, using a simple example we shall compare the failure load predicted from linear elastic fracture mechanics with the one predicted by classical strength of material. The ability to learn independently, working in team and interpret the results objectively will also be emphasized in this course.

SKMO 3333 Naval Architecture II
This course introduces students to further naval architectural knowledge. It enables students to familarise themselves with naval architectural terms ship components and undertakes hydrostatics and stability calculations. Students will be able to carry out calculations to determine ship stability in all conditions. The content covers calculation of areas, moments and centroids, transverse stability, longitudinal stability, large angle stability, damage stability and launching.

SKMO 3523 Ship and Offshore Design I
This course firstly explains the concepts of engineering design and later relates them to the process and procedures in ship design. Emphasis is made on preliminary design

calculations to satisfy owner's requirements and related legislations. The hands on part will deals with design tasks, including hull form design (manually and computer aided) hydrostatics calculation and General Arrangement Design. The students will be given a real design job and working as consultant group to closely replicates the real ship design practice.

SKMO 3353 Ship Resistance & Propulsion
This course introduces students to ship hydrodynamics, dimensional analysis, fundamental of ship resistance, ship resistance and its components, fundamental of ship model testing and extrapolation methods and marine propulsors. The course also includes propeller theories, methods of propeller design and the study of cavitation phenomena together with the analysis of propeller-engine matching.

SKMO 3713 Ship and Offshore Production Technology
This course is essential as it prepares the students with the basic knowledge and exposure on construction process of ship & offshore structures. This course covers the hardware and software aspects of ship and offshore production technology. It begins with the introduction to shipbuilding industry, its importance and development in world economics and in Malaysia, Ship and offshore/production construction process flow chart and activities. Production/construction yards location, layout and facilities. Material treatments including surface preparation, cutting process, welding, painting process and etc. that involved in the construction process. It followed by subassembly, block assembly and erection process of offshore structures. Upon completion, launching, transporting and upsetting process will also be discussed. On the soft engineering side, the quality control and production system will also be taught. Apart from normal lecture hours, the student is expected to carry out class assignment, field survey or site visits to ship and offshore production yards and technical writing. Therefore, the course is expected to develop and enhance the student ability to discuss and explain the related knowledge, work in team effectively, long life learning and communication skills.

SKMO 3812 Marine Transport & Economic
The course focuses on delivering knowledge to students on two aspects of maritime transport and economics. Firstly is on the basic definitions and process for the efficient operation of global port and shipping operations. Secondly is on the basic definition for the economics of port and shipping operations up to the concepts for appraising investment and financial performance. Additional knowledge is also given to students on the current issues influencing the world maritime scenario. The topics selected are globalization, technology and knowledge while addressing environmental issues.

SKMO 3915 Industrial Training
Industrial training exposes students to the real work setting in various industries for 12 weeks. The students are placed in industries that best suit their area of studies. It is an experiential learning which requires the students to learn the process and able to apply their knowledge acquired in class into actual industrial setting. The knowledge acquire during practical training may be used later in final year class as well as to equip them with sufficient knowledge for job interviews.

SKMO 4233 Dynamics of Marine Vehicles
Marine vehicles and structures are built for transportation and also to perform various marine activities such as fishing and offshore drilling. This course provides the knowledge of the characteristics of vessels/structures and the effect of the environment on their behaviour. The course begins with the introduction to effects of waves on vessels and structures. Since ocean waves are complex in nature, by incorporating linear wave theory, statistical methods can be adopted to study the irregular behaviour of waves and relate to vessels/structures motions characteristics. Some of the topics include; Introduction to sea keeping and solving seakeeping in waves using strip theory, Introduction to

maneuverability of vessels that are motions in the horizontal plane so that they can proceed on a straight path, turn or take other avoiding actions in calm water as well as in waves, wind and current. This course emphasises on the students' ability to identify and solve the behaviour marine vehicles/ structures problems by carrying the necessary calculation and analysis.

SKMO 4422 Marine and Offshore Engineering System
The course covers the main engineering systems of the ship and offshore structure machinery. This includes the propulsion and auxiliary systems. Selected analyses of the thermodynamic processes of the system, description of the plant main components, operating principle and performances will be studied. This includes the marine diesel engine and steam turbine power plant, electric and hydraulic power system. Other important support system such as air conditioning, fire, condition and performance monitoring system will also be covered.

SKMO 4533 Ship and Offshore Design II
This course is the continuation of Ship Design I course. Having design the ship hull forms and its related general arrangement to serve its functions done previously, this course continues by continuing the necessary design tasks including Stability Calculation and Assessment, Scantling Calculation and Strength Assessment, and Shell Expansion & Material take off. This course emphasis is Hands on Design Project works (in group) with continuous monitoring from the lecturer. Apart from providing the necessary technical knowledge and skills, the course also aimed at developing the necessary generic skills such as team working, oral and written presentation skills, project management skills etc. The contents and conduct of the design project are as much as possible tailored to the real design practice in industry.

SKMO 4823 Engineering Management Environment & Safety
This course aims to prepare students with knowledge on basic principles of management, project management, marine environment and safety. The management part will examine key issues in management and organization, past management and today, strategic management, organizational structure and design, human resource management, motivating employees and leadership. Project management shall cover network analysis, resources constrained project, crash time and project performance and risk assessment. Main topics covered under environment and safety will be IMO, MARPOL, SOLAS and the like. OSHA 1994, Factories and Machinery Act 1967 shall also be mentioned. Safety topics cover hazard identification, risk assessment and control, basic principles of accident prevention and occupational health. At the end of the course, students should be able to describe fundamental aspects of management, integrate knowledge in engineering and management in making business decisions, apply the principles of hazard identification, risk assessment/ control, plan, design and implement an effective safety program.

SKMO 4912 Undergraduate Project I
This course introduces the final year students on how to do academic research on their own by applying knowledge and skills they acquired from other courses. Given a topic on a project students have to identify a problem, gather relevant information to the problem and propose solutions to problems. In this course, students have to do some literature surveys in order to understand the nature of the problem and investigate work done by other researchers in line with their work. The students are also required to propose a methodology on how to solve the problems. By the end of this course, the students are expected to submit and present their research proposal to be assessed by their supervisors and panel of assessors.

SKMO 4924 Undergraduate Project II
This course is the continuation of Undergraduate Project (UGP) I. It enhances the students' knowledge and ability to identify and solve problems through academic research. It will

provide an exercise for the student in carrying out research with minimum supervision and the ability to plan and manage their work effectively. This course will also develop the students' capability to present, discuss and analyze results of the research clearly, effectively and confidently in both oral presentation and in dissertation.

SKMO 4941 Marine Laboratory I

This course is designed to enable students to apply knowledge on ship resistance and ship stability, and motions in their laboratory works. This course will also train students to plan and manage their work within a given timeline. It also develops students' capability to present, discuss and analyse experimental results clearly, effectively and confidently in an oral presentation as well as in a written laboratory reports.

SKMO 4951 Marine Laboratory II

This course is designed to enable students to apply knowledge of seakeeping, maneuvering and also ship propulsion in their laboratory works. This course will also train students to plan and manage their work within a given timeline. It also develop students' capability to present, discuss and analyse experimental results clearly, effectively and confidently in an oral presentation as well as in a written laboratory reports.

ELECTIVE COURSES:

Elective courses are offered to provide a wider area of study. Students can choose the courses according to their interest. Elective I tend to focus on general issues in marine industry. While Elective II covers more technically inclined matters. Details of each course are as follows;

ELECTIVE I

SKMO 4012 Marine Meteorology and Oceanography

This course gives an introduction to the courses of oceanography and marine meteorology. It explains the fluid physical characteristics and movement on the earth surface. As such, the student will have a clear understanding of the weather which results from the interaction between the atmosphere and the sea surface.

SKMO 4132 Marine Control Engineering

The course encompasses control engineering analysis and the vessel's auxiliary systems. This includes marine control engineering systems, hydraulic and electrical system. The students are expected to solve control engineering problems, analyse the performance and operation of marine control systems

SKMO 4142 Reliability of Ship and Offshore Structures

This course provides reliability of ship and offshore structure as the complement of the failure probability for a rational measure of safety in structural design. The course applies the reliability method which deals with the uncertain nature of loads, resistance, etc. and leads to assessment of the reliability. The reliability method is based on analysis models for the structure in conjunction with available information about loads and resistances and their associated uncertainties. These are introduced to the analysis models that are usually imperfect, and the information about loads and resistances is usually incomplete. At the end of the course, students should be able to calculate the reliability as assessed by reliability method that is generally not a purely physical property of the structure but rather a nominal measure of safety of the structure given a certain analysis model and a certain amount and quality of information.

ELECTIVE II

SKMO 4152 Platform Pipeline and Sub-Sea-Technology
This course provides the concepts of offshore platform, submarine pipeline and subsea-technology, basic calculation on strength and fatigue, safety on fatigue life, reliability assessment, design issues, fabrication, installation and operations of offshore platform, submarine pipelines and risers, and also understanding of the equipment used in subsea developments.

SKMO 4262 Riser and Mooring Dynamics
This course provides the design and installation operations of riser and mooring Systems. Emphasis is made on design of deep water moorings and riser system by the accepted industry practices, design codes and criteria. It starts with the types and layout of risers layout, geometry of mooring and line types. Then, the riser and mooring line design cycle is introduced and in this section, the students calculate the environmental loads pretension and static equilibrium, and Vortex Induced Vibration (VIV), and analyze the static and dynamic performances including floater. The students also solve the dynamic performances of riser/ mooring lines using simulation software (eg. MOSES) and analyze the fatigue of riser and mooring chains.

SKMO 4452 Marine Engineering System Project
Marine Engineering System Project is designed for final year students to perform marine systems design. Students are required to specifically design a typical marine engineering system for a chosen ship or offshore vehicles. Students are then required to integrate these systems together to form a workable compromise and fulfill the vessel's intended function. The students are expected to understand the design processes, operations and selection of the auxiliary systems. During the course of the subject students are required to have numerous discussions and presentations to complete the design. Implementation of this course is via group project.