BACHELOR OF ENGINEERING

PROGRAM IN MECHATRONICS ENGINEERING

GRADUATION REQUIREMENTS

Assumption University confers the degree of Bachelor of Engineering in Mechatronics Engineering upon students who meet all of the following requirements:
1. Have completed the total number of credits of the curriculum
2. Have obtained a cumulative grade point average of at least 2.00
3. Have met the minimum English proficiency requirement specified in one of the following criteria:
   (1) AU English Proficiency Assessment   70% or
   (2) TOEFL (iBT)   90   or
   (3) TOEFL (P)   575 or
   (4) IELTS   6.5
4. Have participated in 16 sessions of the Professional Ethics Seminar
5. Have obtained library and financial clearance from the University
6. Have demonstrated good behavior and discipline

OBJECTIVES OF CURRICULUM

To produce graduates who have the characteristics, knowledge and skills as follows:
1. Have moral and professional ethics.
2. Have knowledge in Mechatronics Engineering and able to apply knowledge.
3. Capable of conducting research in both theoretical and practical aspects.
4. Have good personality, good social manners and able to appropriately work with people of all levels.
5. Have strong mathematical, computational and information technology skills
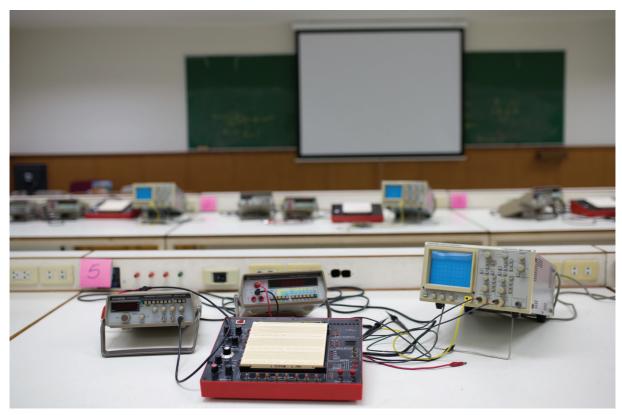
CURRICULUM STRUCTURE

Total number of credits	146 Credits
A. General Education Courses	**31 Credits**
Language Courses	12 Credits
Social Science Courses	6 Credits
Humanities Course	3 Credits
Science and Mathematics Courses	10 Credits
B. Specialized Courses	**109 Credits**
Basic Engineering Courses	20 Credits
Core Courses	21 Credits
Major Required Courses	62 Credits
Major Elective Courses	6 Credits
C. Free Elective Courses	**6 Credits**

COURSES

A. General Education Courses

Language Courses		12 Credits
BG 1001	English I	3 (2-3-6)
BG 1002	English II	3 (2-3-6)
BG 2000	English III	3 (2-3-6)
BG 2001	English IV	3 (2-3-6)

Social Science Courses		6 Credits
GE 2202	Ethics	3 (3-0-6)
MGT 1101	Introduction to Business	3 (3-0-6)

Humanities Course		3 Credits
GE 2101	World Civilization	3 (3-0-6)

Science and Mathematics Courses		10 Credits
BG 0008	General Chemistry Laboratory	1 (0-3-2)
BG 1108	General Chemistry	3 (3-0-6)
BG 1221	Computer Programming	3 (3-0-6)
BG 2208	Discrete Mathematics	3 (3-0-6)

B. Specialized Courses

Basic Engineering Courses — 20 Credits

BG 1204	Calculus I	3 (3-0-6)
BG 1205	Calculus II	3 (3-0-6)
BG 1211	Physics I	3 (3-0-6)
BG 1212	Physics Laboratory I	1 (0-3-2)
BG 1213	Physics II	3 (3-0-6)
BG 1214	Physics Laboratory II	1 (0-3-2)
BG 2207	Engineering Mathematics	3 (3-0-6)
BG 2212	Applied Statistics	3 (3-0-6)

Core Courses — 21 credits

Core Courses for All Concentrations — 17 credits

EE 2203	Signals and Systems	3 (3-0-6)
IE 1110	Engineering Materials	3 (3-0-6)
ME 1113	Engineering Drawing	3 (3-0-6)
ME 1114	Engineering Workshop	2 (0-4-2)
ME 2211	Engineering Mechanics I	3 (3-0-6)
ME 2220	Engineering Mechanics II	3 (3-0-6)

Core Courses for Concentration in Automation Engineering — 4 credits

EE 3402	Electrical Machines	3 (3-0-6)
EE 3403	Electrical Machines Laboratory	1 (3-0-6)

Core Courses for Concentration in Marine Engineering — 4 credits

ME 3501	Naval Architecture and Ship Construction	4 (4-0-8)

Major Required Courses — 62 credits

Major Required Courses for All Concentrations — 41credits

CE 2704	Digital Logic Design	3 (3-0-6)
CE 2705	Digital Logic Design Laboratory	1 (0-3-2)
EE 2201	Electric Circuits	3 (3-0-6)
EE 2202	Electric Circuits Laboratory	1 (0-3-2)
EE 2401	Electromechanical Energy Conversion	3 (3-0-6)
EE 2402	Electromechanical Energy Conversion Laboratory	1 (0-3-2)
EE 2605	Engineering Electronics	3 (3-0-6)
EE 2606	Engineering Electronics Laboratory	1 (0-3-2)
EE 3406	Control Systems	3 (3-0-6)
EE 4705	Power Electronics	3 (3-0-6)
EE 4706	Power Electronics Laboratory	1 (0-3-2)
IE 3100	Manufacturing Processes	3 (3-0-6)
MCE 2101	Fundamentals of Mechatronics Engineering	3 (3-0-6)
MCE 2102	Mechatronics Engineering Laboratory I	1 (0-3-2)
MCE 4103	Mechatronics Engineering Laboratory II	1 (0-3-2)
MCE 4901	Mechatronics Engineering Project I	1 (0-3-2)
MCE 4902	Mechatronics Engineering Project II	2 (0-6-3)
ME 3110	Mechanics of Materials	3 (3-0-6)
ME 3311	Pneumatic and Hydraulic Systems	3 (3-0-6)
ME 3312	Pneumatic and Hydraulic Systems Laboratory	1 (0-3-2)

Major Required Courses for Concentration in Automation Engineering		21 credits
CE 4201	Image Processing and Computer Vision	3 (3-0-6)
EE 3405	Digital Control Systems	3 (3-0-6)
EE 3606	Electrical Instruments and Measurements	3 (3-0-6)
EE 3705	Microprocessors and Microcontrollers	3 (3-0-6)
MCE 4101	Introduction to Robotics	3 (3-0-6)
MCE 4102	Introduction to Industrial Automation	3 (3-0-6)
ME 3120	Mechanics of Machinery	3 (3-0-6)

Major Required Courses for Concentration in Marine Engineering		21 credits
ME 3204	Marine Electrical Powering and Systems	3 (3-0-6)
ME 3410	Thermodynamics	3 (3-0-6)
ME 3414	Fluid Mechanics	3 (3-0-6)
ME 3418	Heat Transfer	3 (3-0-6)
ME 4502	Marine Propulsion and Machinery Systems	3 (3-0-6)
ME 4506	Ship Dynamics	3 (3-0-6)
ME 4512	Ship Operation and Maintenance	3 (3-0-6)

Major Elective Courses		6 credits

Students can take major elective courses of 6 credits from the following courses.

CE 3001	Commercial Application Programming	3 (3-0-6)
CE 3003	Mobile Applications Development	3 (3-0-6)
CE 4221	Network Applications and Technology	3 (3-0-6)
CE 4224	Telecommunication Network Laboratory	1 (0-3-2)
CE 4225	Computer and Network security	3 (3-0-6)
CE 4301	Fundamental of Internet of Things	3 (3-0-6)
EE 3301	Electromagnetic Fields	3 (3-0-6)
EE 3704	Embedded Systems	3 (3-0-6)
EE 4305	Digital Signal Processing	3 (3-0-6)
EE 4501	Power System Analysis	3 (3-0-6)
EE 4503	Electrical System Design	3 (3-0-6)
EE 4506	High Voltage Engineering	3 (3-0-6)
EE 4602	Industrial Instrumentation and Control	3 (3-0-6)
EE 4603	Industrial Electronics	3 (3-0-6)
EE 4701	Microprocessor Interface Techniques	3 (3-0-6)
IE 2110	Introduction to Manufacturing with Plastics	3 (3-0-6)
IE 4101	Manufacturing and Information Technology	3 (3-0-6)
IE 4201	Engineering Management	3 (3-0-6)
IE 4203	Engineering Economics	3 (3-0-6)
MCE 4801	Instrument for Aviation	6 (6-0-12)
MCE 4903	Advanced Topics in Mechatronics Engineering	3 (3-0-6)
MCE 4904	Special Problems in Mechatronics Engineering	3 (3-0-6)
MCE 4907	Engineering Internship	3 (0-9- 6)
ME 4010	Machine Design	3 (3-0-6)
ME 4310	Mechanical Vibration	3 (3-0-6)
ME 4412	Internal Combustion Engines	3 (3-0-6)
ME 4414	Air Conditioning	3 (3-0-6)
ME 4505	Ship Design	3 (3-0-6)
ME 4602	Maritime Robotics	3 (3-0-6)
TE 3000	Principles of Communications	3 (3-0-6)

Students can also select major required courses of other majors as their major elective courses.

C. Free Elective Course	6 Credits

Students can take free elective courses of 6 credits from any faculty in Assumption University upon completion of the prerequisites (if any).

STUDY PLAN
(1) AUTOMATION ENGINEERING

FIRST YEAR
First Semester

Code	Subjects	Credits
BG 1001	English I	3 (2-3-6)
BG 1204	Calculus I	3 (3-0-6)
BG 1211	Physics I	3 (3-0-6)
BG 1212	Physics Laboratory I	1 (3-0-6)
BG 1221	Computer Programming	3 (3-0-6)
BG 1113	Engineering Drawing	3 (2-3-6)
ME 1114	Engineering Workshop	2 (0-4-2)
	Total	**18 (13-13-34)**

Second Semester

Code	Subjects	Credits
BG 0008	General Chemistry Laboratory	1 (0-3-2)
BG 1002	English II	3 (2-3-6)
BG 1108	General Chemistry	3 (3-0-6)
BG 1205	Calculus II	3 (3-0-6)
BG 1213	Physics II	3 (3-0-6)
BG 1214	Physics Laboratory II	1 (0-3-2)
BG 2208	Discrete Mathematics	3 (3-0-6)
IE 1110	Engineering Materials	3 (3-0-6)
	Total	**20 (17-9-40)**

SECOND YEAR
First Semester

Code	Subjects	Credits
BG 2000	English III	3 (2-3-6)
BG 2207	Engineering Mathematics	3 (3-0-6)
CE 2704	Digital Logic Design	3 (3-0-6)
CE 2705	Digital Logic Design Laboratory	1 (0-3-2)
EE 2201	Electric Circuits	3 (3-0-6)
EE 2202	Electric Circuits Laboratory	1 (0-3-2)
MCE 2101	Fundamental of Mechatronics Engineering	3 (3-0-6)
MCE 2102	Mechatronics Engineering Laboratory I	1 (0-3-2)
ME 2211	Engineering Mechanics I	3 (3-0-6)
	Total	**21 (17-12-42)**

Second Semester

Code	Subjects	Credits
BG 2001	English IV	3 (2-3-6)
BG 2212	Applied Statistics	3 (3-0-6)
EE 2203	Signals and Systems	3 (3-0-6)
EE 2401	Electromechanical Energy Conversion	3 (3-0-6)
EE 2402	Electromechanical Energy Conversion Laboratory	1 (0-3-2)
EE 2605	Engineering Electronics	3 (3-0-6)
EE 2606	Engineering Electronics Laboratory	1 (0-3-2)
ME 2220	Engineering Mechanics II	3 (3-0-6)
	Total	**20 (17-9-40)**

THIRD YEAR
First Semester

Code	Subjects	Credits
EE 3402	Electrical Machines	3 (3-0-6)
EE 3403	Electrical Machines Laboratory	1 (0-3-2)
EE 3406	Control Systems	3 (3-0-6)
EE 3606	Electrical Instruments and Measurements	3 (3-0-6)
EE 3705	Microprocessors and Microcontrollers	3 (3-0-6)
ME 3120	Mechanics of Machinery	3 (3-0-6)
ME 3311	Pneumatic and Hydraulic Systems	3 (3-0-6)
ME 3312	Pneumatic and Hydraulic Systems Laboratory	1 (0-3-2)
	Total	**20 (18-6-40)**

Second Semester

Code	Subjects	Credits
GE 2101	World Civilization	3 (3-0-6)
CE 4201	Image Processing and Computer Vision	3 (3-0-6)
EE 3405	Digital Control Systems	3 (3-0-6)
IE 3100	Manufacturing Processes	3 (3-0-6)
ME 3110	Mechanics of Materials	3 (3-0-6)
	Total	**15 (15-0-30)**

FOURTH YEAR
First Semester

Code	Subjects	Credits
GE 2202	Ethics	3 (3-0-6)
MCE 4101	Introduction to Robotics	3 (3-0-6)
MCE 4103	Mechatronics Engineering Laboratory II	1 (0-3-2)
MCE 4901	Mechatronics Engineering Project I	1 (0-3-2)
MGT 1101	Introduction to Business	3 (3-0-6)
	One Major Elective Course	3 (3-0-6)
	One Free Elective Course	3 (3-0-6)
	Total	**17 (15-6-34)**

Second Semester

Code	Subjects	Credits
EE 4705	Power Electronics	3 (3-0-6)
EE 4706	Power Electronics Laboratory	1 (0-3-2)
MCE 4102	Introduction to Industrial Automation	3 (3-0-6)
MCE 4902	Mechatronics Engineering Project II	2 (0-6-3)
	One Major Elective Course	3 (3-0-6)
	One Free Elective Course	3 (3-0-6)
	Total	**15 (12-9-29)**

STUDY PLAN
(2) MARINE ENGINEERING

FIRST YEAR
First Semester

Code	Subjects	Credits
BG 1001	English I	3 (2-3-6)
BG 1204	Calculus I	3 (3-0-6)
BG 1211	Physics I	3 (3-0-6)
BG 1212	Physics Laboratory I	1 (3-0-6)
BG 1221	Computer Programming	3 (3-0-6)
BG 1113	Engineering Drawing	3 (2-3-6)
ME 1114	Engineering Workshop	2 (0-4-2)
	Total	**18 (13-13-34)**

Second Semester

Code	Subjects	Credits
BG 0008	General Chemistry Laboratory	1 (0-3-2)
BG 1002	English II	3 (2-3-6)
BG 1108	General Chemistry	3 (3-0-6)
BG 1205	Calculus II	3 (3-0-6)
BG 1213	Physics II	3 (3-0-6)
BG 1214	Physics Laboratory II	1 (0-3-2)
BG 2208	Discrete Mathematics	3 (3-0-6)
IE 1110	Engineering Materials	3 (3-0-6)
	Total	**20 (17-9-40)**

SECOND YEAR
First Semester

Code	Subjects	Credits
BG 2000	English III	3 (2-3-6)
BG 2207	Engineering Mathematics	3 (3-0-6)
CE 2704	Digital Logic Design	3 (3-0-6)
CE 2705	Digital Logic Design Laboratory	1 (0-3-2)
EE 2201	Electric Circuits	3 (3-0-6)
EE 2202	Electric Circuits Laboratory	1 (0-3-2)
MCE 2101	Fundamental of Mechatronics Engineering	3 (3-0-6)
MCE 2102	Mechatronics Engineering Laboratory I	1 (0-3-2)
ME 2211	Engineering Mechanics I	3 (3-0-6)
	Total	**21 (17-12-42)**

Second Semester

Code	Subjects	Credits
BG 2001	English IV	3 (2-3-6)
BG 2212	Applied Statistics	3 (3-0-6)
EE 2203	Signals and Systems	3 (3-0-6)
EE 2401	Electromechanical Energy Conversion	3 (3-0-6)
EE 2402	Electromechanical Energy Conversion Laboratory	1 (0-3-2)
EE 2605	Engineering Electronics	3 (3-0-6)
EE 2606	Engineering Electronics Laboratory	1 (0-3-2)
ME 2220	Engineering Mechanics II	3 (3-0-6)
	Total	**20 (17-9-40)**

THIRD YEAR
First Semester

Code	Subjects	Credits
EE 3406	Control Systems	3 (3-0-6)
ME 3204	Marine Electrical Powering and Systems	3 (3-0-6)
ME 3311	Pneumatic and Hydraulic Systems	3 (3-0-6)
ME 3312	Pneumatic and Hydraulic Systems Laboratory	1 (0-3-2)
ME 3410	Thermodynamics	3 (3-0-6)
ME 3414	Fluid Mechanics	3 (3-0-6)
	Total	**16 (15-3-32)**

Second Semester

Code	Subjects	Credits
GE 2101	World Civilization	3 (3-0-6)
IE 3100	Manufacturing Processes	3 (3-0-6)
ME 3110	Mechanics of Materials	3 (3-0-6)
ME 3418	Heat Transfer	3 (3-0-6)
ME 3501	Naval Architecture and Ship Construction	4 (4-0-8)
	One Free Elective Course	3 (3-0-6)
	Total	**19 (19-0-38)**

FOURTH YEAR
First Semester

Code	Subjects	Credits
GE 2202	Ethics	3 (3-0-6)
MCE 4103	Mechatronics Engineering Laboratory II	1 (0-3-2)
MCE 4901	Mechatronics Engineering Project I	1 (0-3-2)
ME 4502	Marine Propulsion and Machinery Systems	3 (3-0-6)
MGT 1101	Introduction to Business	3 (3-0-6)
	One Major Elective Course	3 (3-0-6)
	One Free Elective Course	3 (3-0-6)
	Total	**17 (15-6-34)**

Second Semester

Code	Subjects	Credits
EE 4705	Power Electronics	3 (3-0-6)
EE 4706	Power Electronics Laboratory	1 (0-3-2)
MCE 4902	Mechatronics Engineering Project II	2 (0-6-3)
ME 4506	Ship Dynamics	3 (3-0-6)
ME 4512	Ship Operation and Maintenance	3 (3-0-6)
	One Major Elective Course	3 (3-0-6)
	Total	**15 (12-9-29)**