Republic of the Philippines
BATANGAS STATE UNIVERSITY
Pablo Borbon Main II,Alangilan Batangas
COLLEGE OF ENGINEERING, ARCHITECTURE & FINE ARTS
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CURRICULUM

Bachelor of Science in Mechatronics Engineering (BSMexE)

Academic Year 2018-2019

Reference CMOs: CMO No. 4 s. 2018 and CMO No. 20 s. 2013

Curriculum Description

Mechatronics Engineering deals with the branch of engineering that integrates available and emerging technologies with knowledge in mathematics, natural, social and applied sciences to conceptualize, design, and implement new, improved, or innovative mechatronics systems, devices, goods, services and processes.

Program Educational Objectives

The mechatronics engineering alumni three to five years after graduation shall:

1. Apply knowledge, skills and abilities in mechanical engineering, electrical engineering, electronics engineering, and computing in solving inter-disciplinary problems.
2. Work and lead competently, efficiently and effectively in multi-disciplinary teams to achieve design and/or project objectives.
3. Participate in lifelong learning to maintain professional, ethical and societal responsibilities.

Student Outcomes

The following skills, knowledge, and behaviors are expected to be attained by students as they progress through the program:

a. Ability to apply knowledge of mathematics and science to solve engineering problems.
b. Ability to design and conduct experiments, as well as to analyze and interpret data.
c. Ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability, in accordance with standards.
d. Ability to function on multidisciplinary teams.
e. Ability to identify, formulate, and solve engineering problems.
f. Understanding of professional and ethical responsibility.
g. Ability to communicate effectively.
h. Broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
i. Recognition of the need for, and an ability to engage in life-long learning.
j. Knowledge of contemporary issues.
k. Ability to use techniques, skills, and modern engineering tools necessary for engineering practice.
l. Knowledge and understanding of engineering and management principles as a member and leader in a team, to manage projects and in multidisciplinary environments.

CURRICULUM COMPONENTS

Classification/ Field / Course	No. of Hours/Week		Credit Units
	Lec	Lab	
I. TECHNICAL COURSES			
A. Mathematics			
Differential Calculus	3	0	3
Integral Calculus	3	0	3
Engineering Data Analysis	3	0	3
Differential Equations	3	0	3
Sub-total	**12**	**0**	**12**
B. Natural/Physical Sciences			
General Chemistry	3	3	4
Modern Biology	2	3	3
Physics 1	3	3	4
Sub-total	**8**	**9**	**11**
C. Basic Engineering Sciences			
Introduction to Engineering	0	3	1
Engineering Drawing	0	3	1
Computer-Aided Design	0	3	1
Engineering Economics	3	0	3
Technopreneurship	3	0	3
Engineering Management	2	0	2
Sub-total	**8**	**9**	**11**
D. Allied Courses			
Computer Programming 1	0	3	1
Digital Principles and Logic Design	3	3	4
Electronics Circuits: Devices and Analysis	3	3	4
Control Systems Engineering	2	3	3
Fundamentals of Data Communications	3	0	3
Power Electronics	1	3	2
Circuits 1	3	3	4
Circuits 2	3	3	4
Thermodynamics	3	0	3
Engineering Mechanics	3	0	3
Basic Occupational Safety and Health	3	0	3
Materials Science and Engineering	3	0	3
Environmental Science and Engineering	3	0	3
Physics 2	3	3	4
Sub-total	**36**	**24**	**44**
E. Professional Courses			
1. Core Courses			
Advanced Engineering Mathematics for MexE	3	0	3
Introduction to Electro-mechanical Systems and Automation	3	0	3
Pneumatics and Hydraulics Systems	2	3	3
Physical Systems Modelling of Machine Elements	1	3	2
Basic Workshop and Machining	1	3	2
Robotics 1	3	0	3
PLC Fundamentals and Programming	2	3	3
CAD/CAM and CNC	0	3	1
Robotics 2	2	3	3
Codes, Standards and Professional Ethics	3	0	3
MexE Seminars/Colloquium	0	3	1
Advanced PLC and Systems Integration	3	3	4
MexE Capstone Design 1	0	3	1
MexE Capstone Design 2	0	3	1
Microprocessor and Microcontroller Systems and Design	3	3	4
Electronics Measurements and Instrumentation	1	3	2
Sensors Engineering	2	3	3
Industrial Drives and Control	2	3	3
Research Methods	3	0	3
Manufacturing and Quality Control	3	0	3
Sub-total	**37**	**42**	**51**

2. Technical Electives			
MexE Elective 1	3	0	3
MexE Elective 2	3	0	3
Sub-total	**6**	**0**	**6**
F. On-the-Job Training	320 hrs		**4**
Total (Technical Courses)	**107**	**84**	**139**
II. NON-TECHNICAL COURSES			
A. General Education Course			
Understanding the Self	3	0	3
Mathematics in the Modern World	3	0	3
The Contemporary World	3	0	3
Readings in Philippine History	3	0	3
Purposive Communication	3	0	3
Ethics	3	0	3
Art Appreciation	3	0	3
Science, Technology and Society	3	0	3
Sub-total	**24**	**0**	**24**
B. Filipino/Literature/Mandated Courses			
Kontekstwalisadong Komunikasyon sa Filipino	3	0	3
Filipino sa Iba't Ibang Disiplina	3	0	3
ASEAN Literature	3	0	3
Life and Works of Rizal	3	0	3
Sub-total	**8**	**0**	**8**
D. National Service Training Program			
NSTP 1	3	0	3
NSTP 2	3	0	3
Sub-total	**6**	**0**	**6**
Total (Non-Technical Courses)	**50**	**0**	**50**
GRAND TOTAL	**157**	**84**	**189**

SUMMARY	
Courses	**Number of Units**
I. Technical Courses	
A. Mathematics	12
B. Natural/Physical Sciences	11
C. Basic Engineering Sciences	11
D. Allied Courses	44
E. Professional Courses	
1. Core Courses	51
2. Elective Courses	6
F. OJT	4
II. Non-Technical Courses	
A. General Education Courses	24
B. Filipino/Literature/Mandated Courses	12
C. Physical Education	8
D. NSTP	6
GRAND TOTAL	**189**

PROGRAM OF STUDY

FIRST YEAR						
First Semester						
Course Code	**Course Title**	**No. of Hour/s**		**Unit/s**	**Pre-requisite/s**	**Co-requisite/s**
		Lec	**Lab**			
MATH 401	Differential Calculus	3	0	3		
SCI 401	General Chemistry	3	3	4		
ENGG 401	Introduction to Engineering	0	3	1		
GEd 102	Mathematics in the Modern World	3	0	3		
GEd 105	Readings in Philippine History	3	0	3		
GEd 101	Understanding the Self	3	0	3		
GEd 106	Purposive Communication	3	0	3		
PE 101	Physical Fitness, Gymnastics and Aerobics	2	0	2		
NSTP 111	National Service Training Program 1	3	0	3		
	Total	**23**	**6**	**25**		
FIRST YEAR						
Second Semester						
Course Code	**Course Title**	**No. of Hour/s**		**Unit/s**	**Pre-requisite/s**	**Co-requisite/s**
		Lec	**Lab**			
MATH 402	Integral Calculus	3	0	3	MATH 401	
SCI 403	Physics 1	3	3	4	MATH 401	MATH 402
GEd 104	The Contemporary World	3	0	3		
GEd 109	Science, Technology and Society	3	0	3		
GEd 108	Art Appreciation	3	0	3		
ENGG 402	Engineering Drawing	0	3	1		
CpE 401	Computer Programming 1	0	3	1		
PE 102	Rhythmic Activities	2	0	2	PE 101	
NSTP 121	National Service Training Program 2	3	0	3	NSTP 111	
	Total	**20**	**9**	**23**		
FIRST YEAR						
Midterm						
Course Code	**Course Title**	**No. of Hour/s**		**Unit/s**	**Pre-requisite/s**	**Co-requisite/s**
		Lec	**Lab**			
GEd 103	Life and Works of Rizal	3	0	3		
GEd 107	Ethics	3	0	3		
SCI 402	Modern Biology	2	3	3		
	Total	**8**	**3**	**9**		
SECOND YEAR						
First Semester						
Course Code	**Course Title**	**No. of Hour/s**		**Unit/s**	**Pre-requisite/s**	**Co-requisite/s**
		Lec	**Lab**			
MATH 404	Differential Equations	3	0	3	MATH 402	
SCI 404	Physics 2	3	3	4	SCI 403	
ENGG 403	Computer-Aided Design	0	3	1	ENGG 402	
MATH 403	Engineering Data Analysis	3	0	3	MATH 402	
ENGG 413	Environmental Science and Engineering	3	0	3	SCI 401	
ENGG 409	Engineering Mechanics	3	0	3	SCI 403	
EE 424	Circuits 1	3	3	4	MATH 402	SCI 404
ME 431	Thermodynamics	3	0	3	SCI 403, MATH 402	
PE 103	Individual and Dual Sports	2	0	2	PE 101	
	Total	**23**	**9**	**26**		
SECOND YEAR						
Second Semester						
Course Code	**Course Title**	**No. of Hour/s**		**Unit/s**	**Pre-requisite/s**	**Co-requisite/s**
		Lec	**Lab**			
MexE 401	Advanced Engineering Mathematics for MexE	3	0	3	MATH 404	
MexE 402	Introduction to Electro-mechanical Systems and Automation	3	0	3	EE 424, ENGG 409	
MexE 403	Pneumatics and Hydraulics Systems	2	3	3	ME 431	
MexE 404	Physical Systems Modelling of Machine Elements	1	3	2	ENGG 403, ENGG 409	
ECE 405	Digital Principles and Logic Design	3	3	4	EE 424	ECE 421
ECE 421	Electronics Circuits: Devices and Analysis	3	3	4	EE 424	
EE 425	Circuits 2	3	3	4	EE 424	MexE 401
PE 104	Team Sports	2	0	2	PE 101	
	Total	**20**	**15**	**25**		

THIRD YEAR						
First Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
MexE 405	Basic Workshop and Machining	1	3	2	MexE 404	ENGG 412
MexE 406	Robotics 1	3	0	3	ENGG 410, MexE 401	
MexE 407	PLC Fundamentals and Programming	2	3	3	ECE 405, MexE 403	
ECE 426	Fundamentals of Data Communications	3	0	3		
ECE 427	Electronics Measurements and Instrumentation	1	3	2	ECE 421, CpE 401	
ECE 428	Power Electronics	1	3	2	ECE 421	
ENGG 404	Engineering Economics	3	0	3	MATH 402	
ENGG 412	Materials Science and Engineering	3	0	3	SCI 401	
	Total	**17**	**12**	**21**		
THIRD YEAR						
Second Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
MexE 408	CAD/CAM and CNC	0	3	1	MexE 405	
MexE 409	Robotics 2	2	3	3	MexE 406	
ECE 425	Control Systems Engineering	2	3	3	MATH 404, EE 425	
ICE 405	Sensors Engineering	2	3	3		ECE 427
ICE 406	Industrial Drives and Control	2	3	3	EE 425	
Fili 101	Kontekstwalisadong Komunikasyon sa Filipino	3	0	3		
ENGG 416	Research Methods	3	0	3	MATH 403	
MexEE 401	MexE Elective 1	3	0	3	3rd year standing	
	Total	**17**	**15**	**22**		
THIRD YEAR						
Midterm						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
ECE 415	Microprocessor and Microcontroller Systems and Design	3	3	4	CpE 401, ECE 405	
MexE 410	Codes, Standards and Professional Ethics for MexE	3	0	3	4th year standing	
ENGG 411	Basic Occupational Safety and Health	3	0	3		
	Total	**9**	**3**	**10**		
FOURTH YEAR						
First Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
MexE 411	MexE Seminars/Colloquium	0	3	1	4th year standing	
MexE 412	Advanced PLC and Systems Integration	3	3	4	MexE 407	
MexE 413	MexE Capstone Design 1	0	3	1	ENGG 416	
ENGG 406	Engineering Management	2	0	2		
IE 425	Manufacturing and Quality Control	3	0	3	MATH 403	
Fili 102	Filipino sa Iba't Ibang Disiplina	3	0	3		
MexEE 402	MexE Elective 2	3	0	3	MexEE 401	
	Total	**14**	**9**	**17**		
FOURTH YEAR						
Second Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
Litr 102	ASEAN Literature	3	0	3		
ENGG 405	Technopreneurship	3	0	3	4th year standing	
MexE 414	MexE Capstone Design 2	0	3	1	Graduating	
ENGG 417	On-the-Job Training	320 hours		4	4th year standing	
	Total	**6**	**3**	**11**		
GRAND TOTAL UNITS		**157**	**84**	**189**		