



## **CURRICULUM**

### **Bachelor of Science in Mechanical Engineering (BSME)**

Academic Year 2018-2019

Reference CMOs: CMO No. 97 s. 2017, CMO No. 4 s. 2018 and CMO No. 20, s. 2013

### **Curriculum Description**

Mechanical Engineering is a profession that concerns itself with mechanical design, energy conversion, fuel and combustion technologies, heat transfer, materials, noise control, and acoustics, manufacturing processes, rail transport, automatic control, product safety and reliability, solar energy, and technological impacts to society.

### **Program Educational Objectives of Mechanical Engineering**

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

1. Successfully practice in mechanical and thermal systems for the advancement of society.
2. Promote professionalism in mechanical engineering practice.

### **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	Number of Hours Per Week		Credit Units
	Lec	Lab	
I. TECHNICAL COURSES			
A. Mathematics			
Differential Calculus	3	0	3
Integral Calculus	3	0	3
Differential Equations	3	0	3
Engineering Data Analysis	3	0	3
Numerical Methods	3	0	3
Sub-Total	15	0	15
B. Natural/Physical Sciences			
General Chemistry	3	3	4
Physics I	3	3	4
Modern Biology	2	3	3
Sub-Total	8	9	11
C. Basic Engineering Sciences			
Engineering Drawing	0	3	1
Computer-Aided Drafting	0	3	1
Computer Fundamentals and Programming	0	3	1
Statics of Rigid Bodies	3	0	3
Dynamics of Rigid Bodies	2	0	2
Mechanics of Deformable Bodies	3	0	3
Engineering Economics	3	0	3
Engineering Management	2	0	2
Technopreneurship	3	0	3
Introduction to Engineering	0	3	1
Environmental Science and Engineering	3	0	3
Sub-Total	19	12	23
D. Allied Courses			
Basic Electrical Engineering	2	3	3
Basic Electronics	2	3	3
DC and AC Machinery	2	3	3
Sub-Total	6	9	9
E. Fundamental Mechanical Engineering Courses			
Mechanical Engineering Orientation	1	0	1
Advanced Mathematics for ME	3	0	3
Methods of Research for ME	3	0	3
Fluid Mechanics	3	0	3
Machine Elements	2	3	3
Materials Engineering & Testing	2	3	3
Thermodynamics 1	3	0	3
Thermodynamics 2	3	0	3
Combustion Engineering	3	0	3
Heat Transfer	3	0	3
ME Laboratory 1	0	3	1
ME Laboratory 2	0	6	2
Manufacturing and Industrial Processes with Plant Visits	1	3	2
Basic Occupational Safety and Health	3	0	3
Workshop Theory and Practice	0	3	1
Machine Shop Theory	0	6	2
Control System Engineering	2	3	3
Fluid Machineries	3	0	3
Refrigeration Systems	3	0	3
Airconditioning and Ventilation Systems	3	0	3
Vibration Engineering	2	0	2
Computer Applications for ME	0	3	1
ME Practice with Comprehensive Examination	0	6	2
On the-Job-Training	320 hrs		4
Sub-Total	43	39	60

<b>F. Professional Mechanical Engineering Courses</b>			
Machine Design 1	3	0	3
Machine Design 2	2	3	3
ME Laboratory 3	0	6	2
Industrial Plant Engineering	3	3	4
Power Plant Design with Renewable Energy	4	3	5
ME Laws, Ethics, Codes and Standards	2	0	2
ME Project Study 1	0	3	1
ME Project Study 2	0	3	1
<b>Sub-Total</b>	<b>14</b>	<b>21</b>	<b>21</b>
<b>G. Elective Courses</b>			
ME Electives (2 units each)	4	0	4
<b>Sub-Total</b>	<b>4</b>	<b>0</b>	<b>4</b>
<b>TOTAL TECHNICAL COURSES</b>	<b>109</b>	<b>90</b>	<b>143</b>
<b>II. NON-TECHNICAL COURSES</b>			
<b>A. General Education Courses</b>			
Purposive Communication	3	0	3
Mathematics in the Modern World	3	0	3
Understanding the Self	3	0	3
Art Appreciation	3	0	3
Ethics	3	0	3
Readings in Philippine History	3	0	3
Contemporary World	3	0	3
Science, Technology and Society	3	0	3
<b>Sub-Total</b>	<b>24</b>	<b>0</b>	<b>24</b>
<b>B. General Education Elective and Mandated Courses</b>			
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
<b>Sub-Total</b>	<b>12</b>	<b>0</b>	<b>12</b>
<b>C. Physical Education</b>			
PE 1,2,3,4 (2 units each)	8	0	8
<b>Sub-Total</b>	<b>8</b>	<b>0</b>	<b>8</b>
<b>D. National Service Training Program</b>			
NSTP 1&2 (3 units each)	6	0	6
<b>Sub-Total</b>	<b>6</b>	<b>0</b>	<b>6</b>
<b>TOTAL NON-TECHNICAL COURSES</b>	<b>50</b>	<b>0</b>	<b>50</b>
<b>GRAND TOTAL</b>	<b>159</b>	<b>90</b>	<b>193</b>

<b>SUMMARY</b>	
<b>Courses</b>	<b>Number of Units</b>
A. Mathematics	15
B. Natural and Physical Sciences	11
C. Basic Engineering Sciences	23
D. Allied Courses	9
E. Fundamental Courses	54
F. Professional Mechanical Engineering Courses	27
G. Technical Electives	4
II. Non-Technical Courses	
A. General Education Courses	24
B. General Education Elective/Mandated Courses	12
C. Physical Education and NSTP	14
<b>TOTAL</b>	<b>193</b>

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			
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		
SCI 401	General Chemistry	3	3	4		
GEd 106	Purposive Communication	3	0	3		
MATH 401	Differential Calculus	3	0	3		
ENGG 401	Introduction to Engineering	0	3	1		
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		
CpE 401	Computer Programming 1	0	3	1		
ENGG 402	Engineering Drawing	0	3	1		
PE 102	Rhythmic Activities	2	0	2	PE 101	
NSTP 121	National Service Training Program 2	3	0	3	NSTP 1	
	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 107	Ethics	3	0	3		
GEd 103	Life and Works of Rizal	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			
ME 401	ME Orientation	1	0	1	ENGG 401	
MATH 404	Differential Equations	3	0	3	MATH 402	
ENGG 407	Statics of Rigid Bodies	3	0	3	SCI 403, MATH 402	
ME 402	Thermodynamics I	3	0	3	SCI 403, MATH 402	
EE 419	Basic Electrical Engineering	2	3	3	SCI 403, MATH 402	
MATH 403	Engineering Data Analysis	3	0	3	MATH 401	
ENGG 403	Computer Aided Design	0	3	1	ENGG 402	
ME 403	Workshop Theory and Practice	0	3	1		
PE 103	Individual and Dual Sports	2	0	2	PE 101	
Fili 101	Kontekstwalisadong Komunikasyon sa Filipino	3	0	3		
	Total	20	9	23		
SECOND YEAR						
Second Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
ME 404	Advanced Mathematics for ME	3	0	3	MATH 404	
ENGG 408	Dynamics of Rigid Bodies	2	0	2	ENGG 407	
ME 405	Thermodynamics 2	3	0	3	ME 402	
EE 422	DC and AC Machinery	2	3	3	EE 419	
ME 406	Fluid Mechanics	3	0	3	ME 402	
ENGG 418	Mechanics of Deformable Bodies	3	0	3	ENGG 407	ENGG 408
ME 407	Computer Applications for ME	0	3	1	ENGG 403	
ME 408	Machine Shop Theory and Practice	0	6	2	ME 403	
PE 104	Team Sports	2	0	2	PE 101	
Fili 102	Filipino sa Iba't Ibang Disiplina	3	0	3		
	Total	21	12	25		



THIRD YEAR						
First Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
ENGG 416	Research Methods	3	0	3	MATH 403	
ME 409	Heat Transfer	3	0	3	ME 405	
ME 410	Combustion Engineering	3	0	3	ME 405	
ME 411	Fluid Machinery	3	0	3	ME 406	
ME 412	Machine Elements	2	3	3	ENGG 408	
ME 413	Materials Engineering and Testing	2	3	3	ENGG 418, SCI 401	
ME 414	ME Elective 1	2	0	2		
ME 415	ME Laboratory 1	0	3	1	ME 405	
ENGG 414	Numerical Methods	3	0	3	ME 404	
Litr 102	ASEAN Literature	3	0	3		
Total		24	9	27		
THIRD YEAR						
Second Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
ME 416	Vibration Engineering	2	0	2	MATH 404	
ME 417	Refrigeration Systems	3	0	3	ME 409	
ME 418	Machine Design 1	3	0	3	ME 412, ME 413	ME 421
ME 419	ME Elective 2	2	0	2		
ECE 422	Basic Electronics	2	3	3	EE 419	
ME 420	ME Laboratory 2	0	6	2	ME 411, ME 415	
ENGG 404	Engineering Economics	3	0	3	MATH 402	
ME 421	ME Laws, Ethics, Contracts, Codes and Standards	2	0	2	GEd 107	
ME 422	ME Project Study 1	0	3	1	ENGG 416	
Total		17	12	21		
THIRD YEAR						
Midterm						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
ME 423	Airconditioning and Ventilation Systems	3	0	3	ME 417	
ENGG 411	Basic Occupational Safety and Health	3	0	3		
ME 424	Machine Design 2	2	3	3	ME 418	
Total		8	3	9		
FOURTH YEAR						
First Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
ENGG 417	On-the-Job Training	320		4	4th Year Standing	
ENGG 413	Environmental Science and Engineering	3	0	3	SCI 401	
ME 425	Power Plant Design with Renewable Energy	4	3	5	ME 410, ME 411	
Total		7	3	12		
FOURTH YEAR						
Second Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
ENGG 405	Technopreneurship	3	0	3	4th Year Standing	
ME 426	Industrial Plant Engineering	3	3	4	ME 423, ME 411	ME 428
ME 427	ME Project Study 2	0	3	1	ME 422	
ME 428	Manufacturing and Industrial Processes with Plant Visits	1	3	2	ENGG 411	ME 426
ME 429	ME Laboratory 3	0	6	2	ME 425	
ENGG 406	Engineering Management	2	0	2		
ME 430	ME Practice with Comprehensive Examination	0	6	2	Graduating	
ECE 425	Control System Engineering	2	3	3	ECE 422	
Total		11	24	19		
GRAND TOTAL UNITS		159	90	193		

- ME Electives:**
1. Introduction to Robotics
  2. Industrial Robots
  3. Engine Friction and Lubrication
  4. Solar Energy and Wind Energy Utilization
  5. Design of Thermal Systems