CURRICULUM
Straight Bachelor's-Master's in Electronics Engineering (SBM ECE)
Academic Year 2021-2022
References: Final Draft of CMO – PSG for graduate degree programs in Engineering, CMO No. 15 s. 2019, CMO No. 101 s. 2017, CMO No. 4 s. 2018 and CMO No. 20 s. 2013

Curriculum Description

The Honor's Degree Program for the Master of Science in Electronics Engineering is a research degree with strong emphasis on contribution to knowledge and to mastery of the field of electronics engineering.

Electronics Engineering is the branch of engineering that integrates available and emerging technologies with knowledge of mathematics, natural, social and applied sciences to conceptualize, design, and implement new, improved, or innovative electronic, computer and communication systems, devices, goods, services and processes.

Upon completion of the Honor's Degree Program for MSECE, the student shall receive both the Bachelor of Science in Electronics Engineering and the Master of Science in Electronics Engineering degrees.

Program Educational Objectives

The Master of Science in Electronics Engineering alumni three to five years after graduation shall:
1. Successfully practice as electronics engineering specialists.
2. Uphold a high degree of professionalism, environmental awareness, social and ethical responsibility in engineering practice.
3. Contribute to the technological advancement through research for the welfare of society.

Student Outcomes

The graduates of Master of Science in Electronics Engineering from the Straight Bachelor's-Master's Program should have the ability to:
a. Demonstrate a comprehensive and broad understanding of electronics engineering principles and apply advanced knowledge on this specific discipline;
b. Analyze, synthesize, create and evaluate electronics engineering systems;
c. Design components, devices and systems to meet specified electronics engineering needs under real – world constraints;
d. Communicate effectively technical knowledge, both orally and in writing, on complex engineering activities;
e. Function effectively as an individual, a team member, or as a leader in diverse work environments;
f. Contribute to the generation, dissemination and preservation of electronics engineering knowledge, methodologies, techniques, and processes;
g. Engage in professional development and life-long learning;
h. Conduct oneself within professional and ethical standards; and
i. Perform independent scientific research that results in creation of new knowledge in the electronics engineering discipline

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
Engineering Management	2	0	2
Sub-total	5	9	8
D. Allied Courses			
Computer Programming 1	0	3	1
Discrete Mathematics	3	0	3
Circuits 1	3	3	4
Circuits 2	3	3	4
Basic Occupational Safety and Health	3	0	3
Material Science and Engineering	3	0	3
Environmental Science and Engineering	3	0	3
Physics 2	3	3	4
Sub-total	21	12	25
E. Professional Courses			
1. Core Courses			
Electromagnetics	4	0	4
Programming for Electronic Tests and Designs	0	3	1
Advanced Engineering Mathematics for ECE	3	0	3
Electronic Devices and Circuits	3	3	4
Digital Principles and Logic Design	3	3	4
Electronic Circuit Analysis and Design	3	3	4
Principles of Communication Systems	3	3	4
Electronic Systems and Design 1	2	3	3
Electronic Systems and Design 2	1	3	2
Modulation and Coding Techniques	3	3	4
Data Communications	3	3	4
Transmission Media and Antenna Systems	3	3	4
Signals, Spectra and Signal Processing	3	3	4
Microprocessor & Microcontroller Systems	3	3	4
ECE Review with Comprehensive Examination	0	6	2
ECE Seminars/Colloquium	0	3	1
ECE Laws and Professional Ethics	3	0	3
Sub-total	40	45	55

2. Technical Electives			
ECE Elective 1	2	3	3
ECE Elective 2	2	3	3
ECE Elective 3	2	3	3
Sub-total	**6**	**9**	**9**
F. On-the Job Training	(320 hours)		4
Total (Technical Courses)	**92**	**84**	**124**
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	**12**	**0**	**12**
C. Physical Education			
Physical Fitness, Gymnastics and Aerobics	2	0	2
Rhythmic Activities	2	0	2
Individual and Dual Sports	2	0	2
Team Sports	2	0	2
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**
III. MASTER'S DEGREE COURSES			
A. Foundation Course	6	0	9
B. Major Course	9	0	9
C. Elective Course	3	0	6
D. Thesis	6	0	6
Total (Master's Degree Courses)	**24**	**0**	**30**
GRAND TOTAL	166	84	204

SUMMARY	
Courses	**Number of Units**
I. Technical Courses	
A. Mathematics	12
B. Natural/Physical Sciences	11
C. Basic Engineering Sciences	8
D. Allied Courses	25
E. Professional Courses	
1. Core Courses	55
2. Elective Courses	9
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
III. Master's Degree Courses	
A. Core Course	9
B. Major Course	9
C. Elective Course	6
D. Thesis	6
GRAND TOTAL	**204**

PROGRAM OF STUDY

FIRST YEAR
FIRST SEMESTER

Code	Course	Units	No. of Hours Lec	No. of Hours Lab	Prerequisite	Co-requisite
MATH 401	Differential Calculus	3	3	0		
SCI 401	General Chemistry	4	3	3		
ENGG 401	Introduction to Engineering	1	0	3		
GEd 102	Mathematics in the Modern World	3	3	0		
GEd 101	Understanding the Self	3	3	0		
GEd 105	Readings in Philippine History	3	3	0		
GEd 106	Purposive Communication	3	3	0		
PE 101	Physical Fitness, Gymnastics and Aerobics	2	2	0		
NSTP 111	National Service Training Program 1	3	3	0		
	Total	**25**	**23**	**6**		

FIRST YEAR
SECOND SEMESTER

Code	Course	Units	No. of Hours Lec	No. of Hours Lab	Prerequisite	Co-requisite
MATH 402	Integral Calculus	3	3	0	MATH 401	
SCI 403	Physics 1	4	3	3	MATH 401	MATH 402
ENGG 402	Engineering Drawing	1	0	3		
CPE 401	Computer Programming 1	1	0	3		
GEd 104	The Contemporary World	3	3	0		
GEd 108	Art Appreciation	3	3	0		
GEd 109	Science, Technology and Society	3	3	0		
PE 102	Rhythmic Activities	2	2	0	PE 101	
NSTP 121	National Service Training Program 2	3	3	0	NSTP 111	
	Total	**23**	**20**	**9**		

FIRST YEAR
MIDTERM

Code	Course	Units	No. of Hours Lec	No. of Hours Lab	Prerequisite	Co-requisite
SCI 402	Modern Biology	3	2	3		
GEd 103	Life and Works of Rizal	3	3	0		
GEd 107	Ethics	3	3	0		
	Total	**9**	**8**	**3**		

SECOND YEAR
FIRST SEMESTER

Code	Course	Units	No. of Hours Lec	No. of Hours Lab	Prerequisite	Co-requisite
MATH 404	Differential Equations	3	3	0	MATH 402	
SCI 404	Physics 2	4	3	3	SCI 403	
MATH 403	Engineering Data Analysis	3	3	0	MATH 402	
ENGG 403	Computer-Aided Design	1	0	3	ENGG 402	
ENGG 413	Environmental Science and Engineering	3	3	0	SCI 401	
EE 424	Circuits 1	4	3	3	MATH 402	SCI 404
ECE 401	Electromagnetics	4	4	0		MATH 404, SCI 404
ECE 402	Programming for Electronic Tests and Designs	1	0	3	CpE 401	
PE 103	Individual and Dual Sports	2	2	0	PE 101	
	Total	**25**	**21**	**12**		

SECOND YEAR
SECOND SEMESTER

Code	Course	Units	No. of Hours Lec	No. of Hours Lab	Prerequisite	Co-requisite
ENGG 412	Material Science and Engineering	3	3	0	SCI 401	
CpE 405	Discrete Mathematics	3	3	0	MATH 402	
EE 425	Circuits 2	4	3	3	EE 424	
ECE 403	Advanced Engineering Mathematics for ECE	3	3	0	MATH 404	
ECE 404	Electronic Devices and Circuits	4	3	3	EE 424, SCI 404	
ECE 405	Digital Principles and Logic Design	4	3	3	EE 424	ECE 404
PE 104	Team Sports	2	2	0	PE 101	
Fili 101	Kontekstwalisadong Komunikasyon sa Filipino	3	3	0		
	Total	**26**	**23**	**9**		

THIRD YEAR
FIRST SEMESTER

Code	Course	Units	No. of Hours Lec	No. of Hours Lab	Prerequisite	Co-requisite
ENGG 501	Computational Mathematics 1	3	3	0		
ECE 406	Electronic Circuit Analysis and Design	4	3	3	ECE 404	
ECE 407	Principles of Communication Systems	4	3	3		ECE 406
GECE 502	Modern Control Theory and Applications*	3	3	0	ECE 403, EE 425	
ECE 409	Electronic Systems and Design 1	3	2	3	ECE 404	
ECEE 401	ECE Elective 1	3	2	3	3rd year standing	
Fili 102	Filipino sa Iba't Ibang Disiplina	3	3	0		
	Total	**24**	**18**	**18**		

THIRD YEAR
SECOND SEMESTER

Code	Course	Units	No. of Hours Lec	No. of Hours Lab	Prerequisite	Co-requisite
ECE 410	Electronic Systems and Design 2	2	1	3	ECE 406, ECE 405	
ECE 411	Modulation and Coding Techniques	4	3	3	ECE 407	
ECE 412	Data Communications	4	3	3	ECE 407	
ECE 413	Transmission Media and Antenna Systems	4	3	3	ECE 407	
ECE 414	Signals, Spectra, and Signal Processing	4	3	3	ECE 403, MATH 403	
	Foundation/Major/Elective Course 1*	3	3	0		
	Foundation/Major/Elective Course 1*	3	2	3		
	Total	**24**	**18**	**18**		

THIRD YEAR
MIDTERM

Code	Course	Units	No. of Hours Lec	No. of Hours Lab	Prerequisite	Co-requisite
ECE 415	Microprocessor & Microcontroller Systems and Design	4	3	3	CpE 401, ECE 405	
ENGG 404	Engineering Economics	3	3	0	MATH 403	
	Total	**7**	**6**	**3**		

FOURTH YEAR
FIRST SEMESTER

Course	Course	Units	No. of Hours Lec	No. of Hours Lab	Prerequisite	Co-requisite
Litr 102	ASEAN Literature	3	3	0		
GECE 503	Management of Technology	3	3	0	4th year standing	
ENGG 417	On-the-Job Training	4	320 hours		4th year standing	
	Foundation/Major/Elective Course 2*	3				
	Foundation/Major/Elective Course 3*	3				
	Total	**16**	**6**	**3**		

FOURTH YEAR
SECOND SEMESTER

Course	Course	Units	No. of Hours Lec	No. of Hours Lab	Prerequisite	Co-requisite
ENGG 411	Basic Occupational Safety & Health	3	3	0		
ECE 417	ECE Review with Comprehensive Examination	2	0	6		
ECE 418	ECE Seminars/Colloquium	1	0	3	4th year standing	
ECE 420	ECE Laws and Professional Ethics	3	3	0	4th year standing	
ENGG 406	Engineering Management	2	2	0	ENGG 404	
ECEE 403	ECE Elective 3	3	2	3	ECEE 402	
	Foundation/Major/Elective Course 4*	3				
ENGG 503	Design of Experiments and Data Analytics*	3	3	0		
	Total	**20**	**10**	**15**		

FIFTH YEAR
FIRST SEMESTER

Code	Course	Units	No. of Hours Lec	No. of Hours Lab	Prerequisite	Co-requisite
GECE 601	Master's Thesis 1*	3				
	Total	**3**	**0**	**0**		

FIFTH YEAR
SECOND SEMESTER

Code	Course	Units	No. of Hours Lec	No. of Hours Lab	Prerequisite	Co-requisite
GECE 602	Master's Thesis 2*	3				
	Total	**3**	**0**	**0**		

*MS Courses

Course Crediting			
MS COURSE		BS COURSE	
Course Code	Course Title	Course Code	Course Title
ENGG 501	Computational Mathematics 1	ENGG 415	Numerical Methods & Analysis
ENGG 503	Design of Experiments and Data Analytics	ENGG 416	Research Methods
GECE 502	Modern Control Theory and Applications	ECE 408	Feedback and Control Systems
GECE 503	Management of Technology	ENGG 405	Technopreneurship

MAPPING OF CURRICULUM COURSES TO PROGRAM OUTCOMES

Course Code	Course Description	STUDENT OUTCOMES						
		1	2	3	4	5	6	7
First Year								
MATH 401	Differential Calculus	I						I
SCI 401	General Chemistry	I					I	I
ENGG 401	Introduction to Engineering	I		I		I		I
GEd 102	Mathematics in the Modern World	I						
GEd 101	Understanding the Self			I				
GEd 105	Readings in Philippine History							I
GEd 106	Purposive Communication			I				I
PE 101	Physical Fitness, Gymnastics and Aerobics							I
NSTP 111	National Service Training Program 1			I				
MATH 402	Integral Calculus	I						I
SCI 403	Physics 1	I					I	I
ENGG 402	Engineering Drawing							I
CPE 401	Computer Programming 1							I
GEd 104	The Contemporary World			I				I
GEd 108	Art Appreciation			I				
GEd 109	Science, Technology and Society							I
PE 102	Rhythmic Activities							I
NSTP 121	National Service Training Program 2			I				
SCI 402	Modern Biology	I						I
GEd 103	Life and Works of Rizal			I				
GEd 107	Ethics				I			
Second Year								
MATH 404	Differential Equations	I						I
SCI 404	Physics 2	I					I	I
MATH 403	Engineering Data Analysis	I						I
ENGG 403	Computer-Aided Design		I					I
ENGG 413	Environmental Science and Engineering	I						I
EE 424	Circuits 1	I					I	I
ECE 401	Electromagnetics	I						I
ECE 402	Programming for Electronic Tests and Designs		I					I
PE 103	Individual and Dual Sports							I
ENGG 412	Material Science and Engineering	I						I
CpE 405	Discrete Mathematics	I						I
EE 425	Circuits 2	I					I	I
ECE 403	Advanced Engineering Mathematics for ECE	I						I
ECE 404	Electronic Devices and Circuits	I					I	I
ECE 405	Digital Principles and Logic Design	I	I				I	I
PE 104	Team Sports					I		I
Fili 101	Kontekstwalisadong Komunikasyon sa Filipino			I				I
Third Year								
ENGG 415	Numerical Methods & Analysis	E						E
ECE 406	Electronic Circuit Analysis and Design	E	E				E	E
ECE 407	Principles of Communication Systems	E	E				E	E
ECE 408	Feedback and Control Systems	E	E				E	E
ECE 409	Electronic Systems and Design 1	D				D		D
ECEE 401	ECE Elective 1	E	E	E				E
Fili 102	Filipino sa Iba't Ibang Disiplina			I				I
ECE 410	Electronic Systems and Design 2	D				D		D
ECE 411	Modulation and Coding Techniques	E	E				E	E
ECE 412	Data Communications	E	E				E	E
ECE 413	Transmission Media and Antenna Systems	E	E				E	E
ECE 414	Signals, Spectra, and Signal Processing	E	E				E	E
ENGG 416	Research Methods			E	I	E		E
ECEE 402	ECE Elective 2	E	E	E				E
ECE 415	Microprocessor & Microcontroller Systems and Design	E	E				E	E
ENGG 404	Engineering Economics	I						I
Fourth Year								
Litr 102	ASEAN Literature			I				I
ECE 416	ECE Capstone Design 1	D	D		E		D	D
ENGG 405	Technopreneurship			D				D
ENGG 417	On-the-Job Training			D		D		D
ENGG 411	Basic Occupational Safety & Health	I	I					I
ECE 417	ECE Review with Comprehensive Examination							D
ECE 418	ECE Seminars/Colloquium							D
ECE 419	ECE Capstone Design 2	D	D		D		D	D
ECE 420	ECE Laws and Professional Ethics			D	D	D		
ENGG 406	Engineering Management			E	E			I
ECEE 403	ECE Elective 3	D	D	D				D

COURSE CODE	COURSES	PROGRAM OUTCOMES								
		a	b	c	d	e	f	g	h	i
ENGG 501	COMPUTATIONAL MATHEMATICS 1	x								
ENGG 502	COMPUTATIONAL MATHEMATICS 2	x								
ENGG 503	DESIGN OF EXPERIMENTS AND DATA ANALYTICS		x	x	x					
ENGG 504	APPLIED MATERIALS SCIENCE AND ENGINEERING	x			x					
GECE 501	LINEAR SYSTEMS THEORY	x			x					
GECE 502	MODERN CONTROL THEORY AND APPLICATIONS	x	x		x					
GECE 503	MANAGEMENT OF TECHNOLOGY				x	x		x		
GECE 504	ADVANCED DIGITAL SIGNAL PROCESSING				x	x		x		
GECE 505	ADVANCED ELECTROMAGNETIC THEORY				x	x		x		
GECE 506	ANTENNAS AND RADIOWAVE PROPAGATION				x	x		x		
GECE 507	OPTICAL FIBER COMMUNICATIONS				x	x		x		
GECE 508	SPECIAL TOPICS IN COMMUNICATIONS				x	x		x		
GECE 509	ADAPTIVE CONTROL				x	x		x		
GECE 510	DIGITAL CONTROL				x	x		x		
GECE 511	MULTIVARIABLE CONTROL SYSTEM				x	x		x		
GECE 512	NONLINEAR SYSTEMS				x	x		x		
GECE 513	OPTIMAL CONTROL				x	x		x		
GECE 514	ADVANCED IMAGE PROCESSING				x	x		x		
GECE 515	ARTIFICIAL INTELLIGENCE FOR CYBER-PHYSICAL SYSTEMS				x	x		x		
GECE 516	DATA MINING				x	x		x		
GECE 517	MACHINE LEARNING				x	x		x		
GECE 518	NEURAL NETWORKS				x	x		x		
GECE 519	ADVANCED ANALOG IC DESIGN				x	x		x		
GECE 520	ADVANCED DIGITAL IC DESIGN				x	x		x		
GECE 521	MIXED-SIGNAL IC DESIGN				x	x		x		
GECE 522	SPECIAL TOPICS IN ELECTRONICS				x	x		x		
GECE 523	SPECIAL TOPICS IN SYSTEMS AND CONTROL				x	x		x		
GECE 601	MASTER'S THESIS 1						x		x	x
GECE 602	MASTER'S THESIS 2			x			x			x