



Republic of the Philippines
BATANGAS STATE UNIVERSITY
The National Engineering University

Alangilan Campus
Golden Country Homes, Alangilan, Batangas City, Philippines 4200
Tel Nos.: (+63 43) 425-0139 local 2121

E-mail Address: coe.alangilan@g.batstate-u.edu.ph | Website Address: <http://www.batstate-u.edu.ph>

College of Engineering

CURRICULUM

Bachelor of Science in Electronics Engineering (BSECE)

Academic Year 2023-2024

Reference CMOs: CMO No. 101 s. 2017, CMO No. 4 s. 2018 and CMO No. 20 s. 2013,
CMO No. 39 s. 2021, CMO No. 40 s. 2021

Curriculum Description

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.

Program Educational Objectives

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

1. Be engaged in the practice of electronics engineering.
2. Promote culture of professionalism, environmental awareness, social and ethical responsibility in engineering practice.
3. Contribute to the technological advancement for the welfare of the humanity.

Institutional Graduate Attributes

The student should achieve at least 75% for each IGA upon graduation.

1. **Knowledge Competence.** Demonstrate a mastery of the fundamental knowledge and skills required for functioning effectively as a professional in the discipline, and an ability to integrate and apply them effectively to practice in the workplace.
2. **Creativity and Innovation.** Experiment with new approaches, challenge existing knowledge boundaries and design novel solutions to solve problems.
3. **Critical and Systems Thinking.** Identify, define, and deal with complex problems pertinent to the future professional practice or daily life through logical, analytical and critical thinking.
4. **Communication.** Communicate effectively (both orally and in writing) with a wide range of audiences, across a range of professional and personal contexts, in English and Pilipino.



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5. **Lifelong Learning.** Identify own learning needs for professional or personal development; demonstrate an eagerness to take up opportunities for learning new things as well as the ability to learn effectively on their own.
6. **Leadership, teamwork, and Interpersonal Skills.** Function effectively both as a leader and as a member of a team; motivate and lead a team to work towards goal; work collaboratively with other team members; as well as connect and interact socially and effectively with diverse culture.
7. **Global Outlook.** Demonstrate an awareness and understanding of global issues and willingness to work, interact effectively and show sensitivity to cultural diversity.
8. **Social and National Responsibility.** Demonstrate an awareness of their social and national responsibility; engage in activities that contribute to the betterment of the society; and behave ethically and responsibly in social, professional and work environments.

Student Outcomes

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

1. **Discipline Knowledge.** Ability to apply mathematics, sciences and principles of engineering to solve complex electronics engineering problems;
2. **Investigation.** Ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions;
3. **Design/Development of Solutions.** Design solution, system, components, processes, exhibiting improvements/innovations, that meet specified needs with appropriate consideration for public health and safety, cultural, societal, economical, ethical, environmental and sustainability issues.
4. **Leadership and Teamwork.** Function effectively as a member of a leader on a diverse team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives;
5. **Problem Analysis.** Identify, formulate, and solve complex electronics engineering problems by applying principles of engineering, science, and mathematics;
6. **Ethics and Professionalism.** Apply ethical principles and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, environmental, and societal contexts;



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7. **Communication.** Communicate effectively on complex engineering activities with the community, and the society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions;
8. **Environment and Sustainability.** Recognize the impact of professional engineering solutions in societal, global, and environmental contexts and demonstrate knowledge of and need for sustainable development;
9. **Lifelong Learning.** Recognize the need for, and ability to engage in independent and life-long learning in the broadest context of technological change;
10. **The Engineer and Society.** Apply reasoning based on contextual knowledge to assess societal, health, safety, legal, cultural, contemporary issues, and the consequent responsibilities relevant to professional engineering practices;
11. **Modern Tool Usage.** Apply appropriate techniques, skills, and modern engineering and IT tools to complex electronics engineering activities;
12. **Project Management and Finance.** Demonstrate knowledge and understanding of engineering management and financial principles as member or a leader of a team to manage projects in multidisciplinary settings, and identify opportunities of entrepreneurship; and
13. **Social and National Responsibility.** Apply acquired electronics engineering knowledge and skills in addressing community problems that contributes to national development.



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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
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
Feedback and Control Systems	3	3	4
Electronic Systems and Design 1	2	3	3



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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 and Microcontroller Systems and Design	3	3	4
ECE Capstone Design 1	0	3	1
ECE Review with Comprehensive Examination	0	6	2
ECE Seminars/Colloquium	0	3	1
ECE Capstone Design 2	0	3	1
ECE Laws and Professional Ethics	3	0	3
Numerical Methods and Analysis	2	3	3
Research Methods	3	0	3
Sub-total	48	57	67
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 hrs		4
Total (Technical Courses)	103	96	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	12	0	12
C. Physical Activities Toward Health and Fitness			
PATHFit 1 - Movement Competency Training	2	0	2
PATHFit 2 - Exercise-based Fitness Activities	2	0	2
PATHFit 3 – Menu of Dance, Sports, Martial Arts, Group Exercise, Outdoor Adventure Activities Menu Offering: (Traditional and Recreational Games)	2	0	2



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PATHFit 4 – Menu of Dance, Sports, Martial Arts, Group Exercise, Outdoor Adventure Activities Menu Offering: (Team Sports, Basketball and Volleyball)	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
GRAND TOTAL	153	96	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	25
E. Professional Courses	
1. Core Courses	67
2. Elective Courses	9
F. OJT	4
II. Non-Technical Courses	
A. General Education Courses	24
B. Filipino/Literature/Mandated Courses	12
C. PATHFit 1-4	8
D. NSTP	6
GRAND TOTAL	189



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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		
GEEd 102	Mathematics in the Modern World	3	0	3		
GEEd 101	Understanding the Self	3	0	3		
GEEd 105	Readings in Philippine History	3	0	3		
GEEd 106	Purposive Communication	3	0	3		
PATHFit 1	Movement Competency Training	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
ENGG 402	Engineering Drawing	0	3	1		
CpE 401	Computer Programming 1	0	3	1		
GEEd 104	The Contemporary World	3	0	3		
GEEd 108	Art Appreciation	3	0	3		
GEEd 109	Science, Technology and Society	3	0	3		
PATHFit 2	Exercise-based Fitness Activities	2	0	2	PATHFit 1	
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			
SCI 402	Modern Biology	2	3	3		
GEEd 103	Life and Works of Rizal	3	0	3		
GEEd 107	Ethics	3	0	3		
Total		8	3	9		



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SECOND YEAR						
First Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
ECE 401	Electromagnetics	4	0	4		MATH 404, SCI 404
ECE 402	Programming for Electronic Tests and Designs	0	3	1	CpE 401	
MATH 403	Engineering Data Analysis	3	0	3	MATH 402	
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	
ENGG 413	Environmental Science and Engineering	3	0	3	SCI 401	
EE 424	Circuits 1	3	3	4	MATH 402	SCI 404
PATHFit 3	Menu of Dance, Sports, Martial Arts, Group Exercise, Outdoor Adventure Activities Menu Offering: (Traditional and Recreational Games)	2	0	2	PATHFit 1 and 2	
Total		21	12	25		

SECOND YEAR						
Second Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
ECE 403	Advanced Engineering Mathematics for ECE	3	0	3	MATH 404	
ECE 404	Electronic Devices and Circuits	3	3	4	EE 424, SCI 404	
ECE 405	Digital Principles and Logic Design	3	3	4	EE 424	ECE 404
ENGG 412	Material Science and Engineering	3	0	3	SCI 401	
CpE 405	Discrete Mathematics	3	0	3	MATH 402	
EE 425	Circuits 2	3	3	4	EE 424	
PATHFit 4	Menu of Dance, Sports, Martial Arts, Group Exercise, Outdoor Adventure Activities Menu Offering: (Team Sports, Basketball and Volleyball)	2	0	2	PATHFit 1 and 2	
Fili 101	Kontekstwalisadong Komunikasyon sa Filipino	3	0	3		
Total		23	9	26		



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THIRD YEAR						
First Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
ENGG 415	Numerical Methods and Analysis	2	3	3	MATH 404, CpE 401	
ECE 406	Electronic Circuit Analysis and Design	3	3	4	ECE 404	
ECE 407	Principles of Communication Systems	3	3	4		ECE 406
ECE 408	Feedback and Control Systems	3	3	4	ECE 403, EE 425	
ECE 409	Electronic Systems and Design 1	2	3	3	ECE 404	
ECEE 401	ECE Elective 1	2	3	3	3rd year standing	
Fili 102	Filipino sa Iba't Ibang Disiplina	3	0	3		
Total		18	18	24		

THIRD YEAR						
Second Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
ECE 410	Electronic Systems and Design 2	1	3	2	ECE 406, ECE 405	
ECE 411	Modulation and Coding Techniques	3	3	4	ECE 407	
ECE 412	Data Communications	3	3	4	ECE 407	
ECE 413	Transmission Media and Antenna Systems	3	3	4	ECE 407	
ECE 414	Signals, Spectra, and Signal Processing	3	3	4	ECE 403, MATH 403	
ENGG 416	Research Methods	3	0	3	MATH 403	
ECEE 402	ECE Elective 2	2	3	3	ECEE 401	
Total		18	18	24		

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	
ENGG 404	Engineering Economics	3	0	3	MATH 402	
Total		6	3	7		



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FOURTH YEAR						
First 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	
ECE 416	ECE Capstone Design 1	0	3	1	ENGG 416	
ENGG 417	On-the-Job Training	320		4	4th year standing	
Total		6	3	11		

FOURTH YEAR						
Second Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
ECE 417	ECE Review with Comprehensive Examination	0	6	2	Graduating	
ECE 418	ECE Seminars/Colloquium	0	3	1	4th year standing	
ECE 419	ECE Capstone Design 2	0	3	1	Graduating	
ECE 420	ECE Laws and Professional Ethics	3	0	3	4th year standing	
ENGG 406	Engineering Management	2	0	2		
ENGG 411	Basic Occupational Safety and Health	3	0	3		
ECEE 403	ECE Elective 3	2	3	3	ECEE 402	
Total		10	15	15		
GRAND TOTAL UNITS		153	96	189		