



Republic of the Philippines
BATANGAS STATE UNIVERSITY

The National Engineering University

Alangilan Campus

Golden Country Homes, Alangilan Batangas City, Batangas, 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 Computer Engineering (BSCpE)

Academic Year 2023-2024

Reference CMOs: CMO No. 87 s. 2017, CMO No. 4 s. 2018 and CMO No. 20, s. 2013,
CMO 39, s. 2021, CMO 40, s. 2021

Curriculum Description

The Bachelor of Science in Computer Engineering (BSCpE) is a program that embodies the Science and technology of design, development, implementation, maintenance and integration of software and hardware components in modern computing systems and computer-controlled equipment.

Program Educational Objectives of Computer Engineering

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

1. Help create innovations to ensure the competitive edge of the Philippine computing industry
2. Adhere to ethical standards in the practice of the computer engineering profession

Institutional Graduate Attributes

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.
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.



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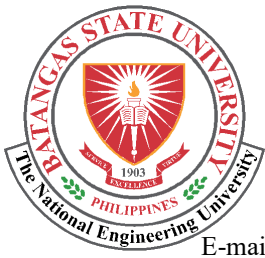
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7. **Global Outlook.** Demonstrate an awareness and understanding of global issues and willingness to work, interact effectively and show sensitivity to cultural diversity.
8. **Social and National Responsibility.** Demonstrate an awareness of their 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 students as they progress through the program:

1. **Discipline Knowledge.** Ability to apply mathematics, sciences and principles of engineering to solve complex computer 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 computer 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.
7. **Communication.** Communicate effectively on complex computer 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;



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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 computer 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.
13. **Social and National Responsibility.** Apply acquired computer 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		Credits 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 and Physical Science			
General Chemistry	3	3	4
Physics I	3	3	4
Modern Biology	2	3	3
Sub-Total	8	9	11
C. Basic Engineering Sciences			
Computer-Aided Design	0	3	1
Engineering Economics	3	0	3
Technopreneurship	3	0	3
Introduction to Engineering	0	3	1
Engineering Drawing	0	3	1
Computer Programming 1	0	3	1
Manufacturing and Quality Control	3	0	3
Sub-Total	9	12	13
D. Allied Courses			
Fundamental of Electrical Engineering	3	3	4
Electronic Circuits: Devices and Analysis	3	3	4
Sub-Total	6	6	8
E. Professional Courses			
Computer Engineering as a Discipline	1	0	1
Programming Logic and Design	0	6	2
Discrete Mathematics	3	0	3
Object Oriented Programming	0	6	2
CpE Laws and Professional Practice	2	0	2
Advanced Engineering Mathematics for CpE	3	0	3
Data Structure and Algorithms	0	6	2
Logic Circuits and Design	3	3	4
Introduction to Networks, Data and Digital Communications (CISCO 1)	2	3	3
Fundamentals of Mixed Signals and Sensors	3	0	3
Feedback and Control Systems	3	0	3
Introduction to HDL	0	3	1
Software Design	3	3	4
Microprocessors	3	3	4
Digital Signal Processing	3	3	4
Emerging Technologies in CpE	3	0	3
CpE Practice and Design 1	0	3	1
Operating Systems	3	0	3
Computer Architecture and Organization	3	3	4
Computer Engineering Drafting and Design	0	3	1
Connecting Networks and Security (CISCO 4)	3	3	4
Embedded Systems	3	3	4
Seminars and Field Trips	0	6	2
CpE Practice and Design 2	0	6	2
Numerical Methods	3	0	3
Research Methods	3	0	3
Basic Occupational Health and Safety	3	0	3
On-the-Job Training	320		4
Routing and Switching (CISCO 2)	0	3	1



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Scaling Networks (CISCO 3)	0	3	1
Sub-Total	53	69	80
F. Cognates/Electives			
Cognate/Track Course 1	2	3	3
Cognate/Track Course 2	2	3	3
Cognate/Track Course 3	2	3	3
Sub-Total	6	9	9
Total Technical Courses	94	105	133
II. Non-technical Courses			
A. General Education Courses			
Mathematics in the Modern World	3	0	3
Readings in Philippine History	3	0	3
Understanding the Self	3	0	3
Contemporary World	3	0	3
Science, Technology and Society	3	0	3
Purposive Communication	3	0	3
Art Appreciation	3	0	3
Ethics	3	0	3
Sub-Total	24	0	24
B. Filipino/Literature/Rizal			
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 Towards 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 and Adventure Activities Menu Offering; Traditional and Recreational Games	2	0	2
PATHFit 4 Menu of dance, sports, Martial Arts, Group exercise, Outdoor and Adventure Activities Menu Offering; Team Sports (Basketball and Volleyball)	2	0	2
Sub-Total	8	0	8
D. NSTP			
NSTP 111	3	0	3
NSTP 121	3	0	3
Sub-Total	6	0	6
Total Non-Technical Courses	50	0	50
GRAND TOTAL	144	105	183

SUMMARY

Courses	Number of Units
I. Technical Courses	
A. Mathematics	12
B. Natural/Physical Sciences	11
C. Basic Engineering Sciences	13
D. Allied Courses	8
E. Professional Courses	80
F. Cognate/Electives	9
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	183



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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			
ENGG 401	Introduction to Engineering	0	3	1		
GEEd 101	Understanding the Self	3	0	3		
GEEd 102	Mathematics in the Modern World	3	0	3		
GEEd 105	Reading in Philippines History	3	0	3		
GEEd106	Purposive Communication	3	0	3		
MATH 401	Differential Calculus	3	0	3		
SCI 401	General Chemistry	3	3	4		
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			
CpE 401	Computer Programming 1	0	3	1		
ENGG 402	Engineering Drawing	0	3	1		
GEEd 104	Contemporary World	3	0	3		
GEEd 108	Art Appreciation	3	0	3		
GEEd 109	Science, Technology and Society	3	0	3		
MATH 402	Integral Calculus	3	0	3	MATH 401	
SCI 403	Physics 1	3	3	4	MATH 401	MATH 402
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			
GEEd 103	Life and Works of Rizal	3	0	3		
GEEd 107	Ethics	3	0	3		
SCI 402	Modern Biology	2	3	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			
CpE 403	Computer Engineering as a Discipline	1	0	1		
CpE 404	Programming Logic and Design	0	6	2		
CpE 405	Discrete Mathematics	3	0	3	MATH 401	
EE 423	Fundamentals of Electrical Engineering	3	3	4	SCI 403	
ENGG 403	Computer-Aided Design	0	3	1	ENGG 402	
ENGG 404	Engineering Economics	3	0	3	MATH 402	
MATH 403	Engineering Data Analysis	3	0	3	MATH 401	
MATH 404	Differential Equations	3	0	3	MATH 402	
PATHFit 3	PATHFit 3 Menu of dance, sports, Martial Arts, Group exercise, Outdoor and Adventure Activities Menu Offering; Traditional and Recreational Games	2	0	2	PATHFit 1 and 2	
Total		18	12	22		

SECOND YEAR						
Second Semester						
Course Code	Course Title	No. of hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
CpE 406	Object Oriented Programming	0	6	2	CpE 404	
CpE 407	CpE Laws and Professional Practice	2	0	2	2nd Year Standing	
CpE 408	Advance Engineering Mathematics for CpE	3	0	3		
CpEE 401	Cognate/Elective Course 1	2	3	3	2nd Year Standing	
ECE 421	Electronic Circuits: Devices and Analysis	3	3	4	EE 423	
ENGG 411	Basic Occupational Health and Safety	3	0	3		
ENGG 414	Numerical Methods	3	0	3	MATH 404	
Fili 101	Kontekstwalisadong Komunikasyon sa Filipino	3	0	3		
PATHFit 4	Menu of dance, sports, Martial Arts, Group exercise, Outdoor and Adventure Activities Menu Offering; Team Sports (Basketball and Volleyball)	2	0	2	PATHFit 1 and 2	
Total		21	12	25		



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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			
CpE 410	Logic Circuits and Design	3	3	4	ECE 421	
CpE 411	Data Structures and Algorithms	0	6	2	CpE 406	
CpE 412	Introduction to Networks, Data and Digital Communications (CISCO 1)	2	3	3	ECE 421	CpE 410
CpE 413	Fundamentals of Mixed Signals and Sensors	3	0	3	ECE 421	
CpE 414	Feedback and Control Systems	3	0	3	ENGG 414; EE 423	
CpE 415	Introduction to HDL	0	3	1	CpE 404; ECE 421	
ENGG 416	Research Methods	3	0	3	MATH 403	
Fili 102	Filipino sa Iba't Ibang Disiplina	3	0	3		
Total		17	15	22		

THIRD YEAR						
Second Semester						
Course Code	Course Title	No. of hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
CpE 417	Microprocessors	3	3	4	CpE 410	
CpE 418	Software Design	3	3	4	CpE 411	
CpE 419	Routing and Switching (CISCO 2)	0	3	1	CpE 412	
CpE 420	Digital Signal Processing	3	3	4	CpE 414	
CpE 421	Emerging Technologies in CpE	3	0	3	3 rd Year Standing	
CpE 422	Cpe Practice and Design 1	0	3	1	ENGG 416	CpE 417
CpEE 402	Cognate/Elective Course 2	2	3	3	CpEE 401	
Total		14	18	20		

THIRD YEAR						
Midterm						
Course Code	Course Title	No. of hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
CpE 423	Scaling Networks (CISCO 3)	0	3	1	CpE 419	
CpE 424	Operating Systems	3	0	3	CpE 411	
CpE 425	Computer Architecture and Organization	3	3	4	CpE 417	
Total		6	6	8		



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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			
CpE 426	Computer Engineering Drafting and Design	0	3	1	ECE 421	
CpE 427	Connecting Networks and Security (CISCO 4)	3	3	4	CpE 423	
CpE 428	Embedded Systems	3	3	4	CpE 417	
CpE 429	Seminars and Fieldtrips	0	6	2	4 th Year Standing	
IE 425	Manufacturing and Quality Control	3	0	3	MATH 403	
CpEE 403	Cognate/Elective Course 3	2	3	3	CpEE 402	
Litr 102	ASEAN Literature	3	0	3		
Total		14	18	20		

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	4 th Year Standing	
ENGG 417	On-the-Job Training	320		4	4 th Year Standing	
CpE 430	CpE Practice and Design 2	0	6	2	CpE 422	
Total		3	6	9		
GRAND TOTAL UNITS		144	105	183		