



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 Industrial Engineering (BSIE)

Academic Year 2023-2024

Reference CMOs: CMO No. 96 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

Industrial Engineering deals with the design, improvement and installation of integrated systems of people, materials, information, equipment, monetary and energy to produce quality and cost – effective goods and services in a healthy and efficient work environment. The field of Industrial Engineering brings together the various sciences concerned with technology, the production of goods, performance of services and the way in which people work. It is the only engineering field with close links to management so many IEs move on to successful careers in management.

Program Educational Objectives of Industrial Engineering

The Industrial Engineering alumni three to five years after graduation shall:

1. Effectively practice Industrial Engineering in various functional areas of an organization.
2. Adapt Industrial Engineering practice to the changing needs of the society and achieve global competitiveness.
3. Adhere to professional, moral, ethical standards in the practice of industrial engineering.

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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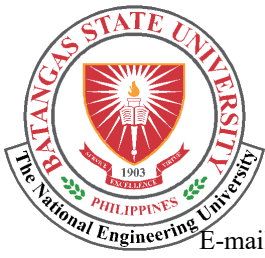
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5. **Lifelong Learning.** Identify own learning needs for professional or personal development; demonstrate an eagerness to take up opportunities for learning new things as well as the ability to learn effectively on their own.
6. **Leadership, teamwork, 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 industrial 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 industrial 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 engineering activities with the community, and the society at large, such as being able to comprehend and write effective



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- 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 industrial 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 industrial engineering knowledge and skills in addressing community problems that contributes to national development.



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CURRICULUM COMPONENTS			
Classification/ Field / Course	Number of Hours/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
Sub-Total	9	0	9
B. Natural/Physical Sciences			
General Chemistry	3	3	4
Physics 1	3	3	4
Modern Biology	2	3	3
Sub-Total	8	9	11
C. Basic Engineering Sciences			
Computer-Aided Design	0	3	1
Computer Programming 1	0	3	1
Computer Programming 2	0	3	1
Engineering Mechanics	3	0	3
Engineering Economics	3	0	3
Basic Occupational Safety and Health	3	0	3
Technopreneurship	3	0	3
Engineering Drawing	0	3	1
Introduction to Engineering	0	3	1
Sub-Total	12	15	17
D. Allied Courses			
Thermodynamics	3	0	3
Elementary Electrical Engineering	3	0	3
Environmental Science and Engineering	3	0	3
Financial Accounting for IE	3	0	3
Managerial Accounting for IE	3	0	3
Principles of Economics	3	0	3
Sub-Total	18	0	18
E. Professional Courses			
1. Core Courses			
Advanced Mathematics for IE	3	0	3
Industrial Materials and Processes	2	3	3
Industrial Organization and Management	3	0	3
Statistical Analysis for IE 1	3	0	3
Statistical Analysis for IE 2	3	0	3
Work Study and Measurement	3	3	4
Operations Research 1	3	0	3
Operations Research 2	3	0	3
Quality Management Systems	3	0	3



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Project Feasibility 1	3	0	3
Project Feasibility 2	2	3	3
Ergonomics 1	2	3	3
Ergonomics 2	2	3	3
Operations Management	3	3	4
Supply Chain Management	3	0	3
Information Systems	3	0	3
Systems Engineering	3	0	3
IE Capstone Project	1	6	3
Engineering Values and Ethics	2	0	2
Methods of Research for IE	3	0	3
IE Practice with Comprehensive Examination	0	6	2
On-the Job- Training	320 hrs		4
Sub-Total	53	30	67
2. Electives			
IE Elective 1(CAD/CAM with Automation)	2	3	3
IE Elective 2(Industrial Quality Control)	3	0	3
IE Elective 3(Six Sigma)	3	0	3
Sub-Total	8	3	9
Total Professional Courses	108	57	131
II. NON-TECHNICAL COURSES			
A. Required General Education			
Understanding the Self	3	0	3
Readings in Philippine History	3	0	3
The Contemporary World	3	0	3
Mathematics in the Modern World	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. General Education Electives			
Kontekstwalisadong Komunikasyon sa Filipino	3	0	3
Filipino sa Iba't Ibang Disiplina	3	0	3
ASEAN Literature	3	0	3
Sub-Total	9	0	9
C. Mandated Course			
Life and Works of Rizal	3	0	3
Sub-Total	3	0	3
C. Physical Activities Towards Health and Fitness			
PATHFit 1 Movements Competency Training	2	0	2
PATHFit 2 Exercise-based Fitness Activities	2	0	2



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PATHFit 3 Menu of Dance, Sports, Martial Arts, Group Exercise, Outdoor & Adventure Activities Menu Offering: Traditional and Recreational Games	2	0	2
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
E. National Service Training Program			
NSTP 111	3	0	3
NSTP 121	3	0	3
Sub-Total	6	0	6
TOTAL OF NON- TECHNICAL COURSES	50	0	50
GRAND TOTAL	158	57	181
SUMMARY			
Courses	Number of Units		
I. Technical Courses			
A. Mathematics	9		
B. Natural/Physical Sciences	11		
C. Basic Engineering Sciences	17		
D. Allied Courses	18		
E. Professional Courses			
1. Core Courses	67		
2. Elective Courses	9		
II. Non-Technical Courses			
A. General Education Courses	24		
B. Filipino/Literature	9		
C. Mandated Courses	3		
D. PATHFit 1-4	8		
E. NSTP	6		
GRAND TOTAL	181		



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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			
GEd 101	Understanding the Self	3	0	3		
GEd 102	Mathematics in the Modern World	3	0	3		
GEd 105	Readings in Philippine History	3	0	3		
GEd 106	Purposive Communication	3	0	3		
PATHFit 1	Movement Competency Training	2	0	2		
NSTP 111	National Service Training Program 1	3	0	3		
SCI 401	General Chemistry	3	3	4		
MATH 401	Differential Calculus	3	0	3		
ENG 401	Introduction to Engineering	0	3	1		
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
CpE 401	Computer Programming 1	0	3	1		
ENG 402	Engineering Drawing	0	3	1		
GEd 104	The Contemporary World	3	0	3		
GEd 108	Art Appreciation	3	0	3		
GEd 109	Science, Technology and Society	3	0	3		
NSTP 121	National Service Training Program 2	3	0	3	NSTP 111	
PATHFit 2	Exercise-based Fitness Activities	2	0	2	PATHFit 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 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		



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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			
MATH 404	Differential Equations	3	0	3	MATH 402	
IE 401	Statistical Analysis for IE 1	3	0	3		
IE 402	Principle of Economics	3	0	3		
IE 403	Financial Accounting for IE	3	0	3		
IE 404	Industrial Organization and Management	3	0	3	Second Year Standing	
CpE 402	Computer Programming 2	0	3	1	CpE 401	
ENGG 413	Environmental Science and Engineering	3	0	3	SCI 401	
Fili 101	Kontekstwalisadong Komunikasyon sa Filipino	3	0	3		
PATHFit 3	Menu of Dance, Sports, Martial Arts, Group Exercise, Outdoor & Adventure Activities Menu Offering: Traditional and Recreational Games	2	0	2	PATHFit 1, PATHFit 2	
Total		23	3	24		

SECOND YEAR						
Second Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
IE 405	Statistical Analysis for IE 2	3	0	3	IE 401	
IE 406	Industrial Materials and Processes	2	3	3	SCI 401, SCI 403	
IE 407	Advanced Mathematics for IE	3	0	3	MATH 404	
IE 408	Work Study and Measurement	3	3	4	IE 401, IE 404	IE 406
ENGG 403	Computer-Aided Design	0	3	1	ENGG 402	
ENGG 404	Engineering Economics	3	0	3	MATH 402	
ENGG 409	Engineering Mechanics	3	0	3	SCI 403	
Fili 102	Filipino sa Iba't Ibang Disiplina	3	0	3		
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, PATHFit 2	
Total		22	9	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			
IE 409	Managerial Accounting for IE	3	0	3	IE 403	
IE 410	Operations Research 1	3	0	3	IE 407	IE 411
IE 411	Quality Management Systems	3	0	3	IE 405, IE 408	
IE 412	Ergonomics 1	2	3	3	IE 408	ENGG 411
IEE 401	IE Elective 1 (CAD/CAM with Automation)	2	3	3	ENGG 403	
ENGG 411	Basic Occupational Safety and Health	3	0	3		
ME 431	Thermodynamics	3	0	3	MATH 402, SCI 403	
Litr 102	ASEAN Literature	3	0	3		
Total		22	6	24		

THIRD YEAR						
Second Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
IE 413	Operations Research 2	3	0	3	IE 410	
IE 414	Operations Management	3	3	4	IE 410, IE 411	
IE 415	Ergonomics 2	2	3	3	IE 412	
IE 416	Project Feasibility 1	3	0	3	IE 409	IE 414
IE 418	Engineering Values and Ethics	2	0	2		
EE 419	Basic Electrical Engineering	3	0	3	SCI 403	
IEE 402	IE Elective 2 (Industrial Quality Control)	3	0	3	IE 411	
Total		19	6	21		

THIRD YEAR						
Midterm						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
IE 417	Project Feasibility 2	2	3	3	IE 416	
IEE 403	IE Elective 3 (Six Sigma)	3	0	3	IE 411	
Total		5	3	6		



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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			
ENGG 405	Technopreneurship	3	0	3	Fourth Year Standing	
ENGG 417	On-the- Job Training	320		4	Fourth Year Standing	
IE 419	Methods of Research for IE	3	0	3	IE 405	
Total		6	0	10		

FOURTH YEAR						
Second Semester						
Course Code	Course Title	No. of Hour/s		Unit/s	Pre-requisite/s	Co-requisite/s
		Lec	Lab			
IE 420	Supply Chain Management	3	0	3	IE 414	
IE 421	Information Systems	3	0	3	CpE 402, Fourth Year Standing	
IE 422	Systems Engineering	3	0	3	Fourth Year Standing	
IE 423	IE Capstone Project	1	6	3	IE 419	
IE 424	IE Practice with Comprehensive Examination	0	6	2	Graduating	
Total		10	12	14		
GRAND TOTAL UNITS		158	57	181		