

Industrial Engineering B. Eng. Program

Program Educational Objectives

To prepare graduates that:

I	<i>Will successfully apply their skills to perform the characteristic tasks for the practice of Industrial Engineering.</i>
II	<i>Will use the fundamentals of Industrial Engineering in the design, development and application of new products and processes to produce solutions in a wide range of business sectors.</i>
III	<i>Will efficiently share information to diverse audiences and be able to develop their professional activities in multidisciplinary teams.</i>
IV	<i>Will practice their profession as Industrial Engineers with a deeply-held sense of ethics, responsibility, respect for the environment and proper understanding of the impact of their work on the social and global economic development.</i>
V	<i>Will pursue additional educational activities for their proper professional development.</i>

Program Outcomes

Graduates of our Industrial Engineering B.Eng. program acquire the knowledge and develop the skills shown below:

1a	<i>They have the knowledge of mathematics, chemistry, physics and engineering necessary for the practice of Industrial Engineering.</i>
1b	<i>They can identify, formulate and solve complex Industrial Engineering problems by applying principles of engineering, science, and mathematics.</i>
2	<i>They can apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.</i>
3	<i>They can communicate effectively with a range of audiences, both orally and in writing.</i>
4	<i>They recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of Industrial Engineering solutions in global, economic, environmental, and societal contexts.</i>
5	<i>They can function effectively on teams whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.</i>
6	<i>They can develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.</i>
7	<i>They understand the need for life-long learning, acquire and apply new knowledge as needed, using appropriate learning strategies.</i>

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Correlation between EAC ABET outcomes and AQU/ANECA competencies profile

ABET	AQU	DESCRIPTION
1a	E1	Ability to understand and apply the necessary basic scientific knowledge (mathematics, physics and chemistry) to practice industrial engineering.
1a	E2	Ability to understand and apply basic technical knowledge, including computer science, graphic expression, mechanical and materials necessary for the practice of industrial engineering.
1a	E3	Knowledge of scientific and technological subjects to enable them to learn new methods and theories and equip them with the versatility to adapt to new situations.
1a	FB1	Ability to solve mathematical problems that may arise in engineering. Ability to apply knowledge of linear algebra; geometry; differential geometry; differential and integral calculus; differential and partial differential equation; numerical methods; numerical algorithms; statistics and optimization.
1a	FB2	Understanding and mastery of basic concepts of the general laws of mechanics, thermodynamics, fields and waves and electromagnetism and its application for solving problems of engineering.
1a	FB3	Basic knowledge on using and programming computers, operating systems, databases and software with applications in engineering.
1a	FB4	Ability to understand and apply the principles of basic knowledge of general chemistry, organic and inorganic chemistry and its applications in engineering.
1a	FB5	Capacity spatial and knowledge of mapping techniques, both traditional methods of geometry and descriptive geometry metric, as in applications of computer-aided design.
1a	FB6	Adequate knowledge of the concept of enterprise, institutional and legal framework of the company. Organization and business management.
1b	CP3	Ability to integrate worked in different subjects studied in the Undergraduate Program in Industrial Technologies Engineering and place it in a real industrial setting contents.
1b	CRI1	Knowledge of applied thermodynamics and heat transfer. Basic principles and their application to solving engineering problems.
1b	CRI10	Basic knowledge and application of environmental technologies and sustainability.
1b	CRI2	Knowledge of the basic principles of fluid mechanics and its application to solving problems in the field of engineering. Calculation of pipes, channels and fluid systems.
1b	CRI3	Knowledge of the fundamentals of science, technology and materials chemistry. Understand the relationship between the microstructure, synthesis or processing and materials properties.
1b	CRI4	Knowledge and application of the principles of circuit theory and electrical machines.
1b	CRI5	Knowledge of the fundamentals of electronics.
1b	CRI6	Knowledge about the fundamentals of automation and control methods.
1b	CRI7	Knowledge of the principles of the theory of machines and mechanisms.
1b	CRI8	Knowledge and application of the principles of the strength of materials.
1b	CRI9	Basic knowledge of production systems and manufacturing.
1b	E4	Ability to solve problems with initiative, decision making, creativity, and critical thinking.

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ABET	AQU	DESCRIPTION
1b	TE1	Knowledge and applications of control machines and electric drives
1b	TE10	Knowledge and skills for the application of engineering materials.
1b	TE11	Applied knowledge of systems and manufacturing processes, metrology and quality control.
1b	TE12	Knowledge of mass and energy balances, biotechnology, mass transfer, separation operations, chemical reaction engineering, reactor design, and recovery and processing of raw materials and energy resources.
1b	TE2	Knowledge of automatic regulation principles and their application to industrial automation.
1b	TE3	Applied knowledge on renewable energy.
1b	TE4	Applied knowledge of industrial computing and communications.
1b	TE5	Knowledge and skills to apply graphic engineering techniques.
1b	TE6	Knowledge and Skills for calculation, design and testing machines.
1b	TE7	Applied knowledge in thermal engineering.
1b	TE8	Knowledge and capabilities for the fundamentals of elasticity and strength of materials the behavior of real solids.
1b	TE9	Knowledge and ability to calculate and design structures and industrial buildings.
2	CP4	Ability to enter the specific tasks of a technician in an industrial company.
2	E7	Ability to develop, program and applying analytical and numerical methods for mathematical modeling in the field of industrial engineering.
2	E8	Ability to develop components, systems, processes or experiments to meet the requirements.
2	TE13	Ability to approach, mathematical modeling, analytical resolution and computational resolution of problems arising in industrial engineering.
3	CP7	Knowledge of technical English at least equivalent to the B2 (The Common European Framework of Reference for Languages: Learning, Teaching, Assessment CEF) level.
3	CP8	Knowledge and practice of communication tools used in enterprises.
3	T1	Ability to communicate effectively, both orally and in writing, to transmit knowledge and skills in the field of industrial engineering.
3	T2	Ability to use English as a foreign language.
4	CP1	Ability to become aware of the social, cultural and environmental impact of professional activities linked to techno-scientific research and industrial production.
4	CP2	Ability to guide ethical and responsible professional activity in the framework of organizations, governments, companies or teams, which collaborate other people and groups with special attention to strict respect for human rights.

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ABET	AQU	DESCRIPTION
4	T6	Ability to analyze and assess the social and environmental impact of technical solutions.
4	T7	Ability to understand the importance of working in an ethically responsible professional environment.
5	CP6	Adequate knowledge to implement collaborative activities and teamwork with other professionals from various fields and level of responsibility in the company.
5	CR111	Applied knowledge of business organization.
5	CR112	Knowledge and skills to organize and manage projects. Knowing the organizational structure and functions of a project office.
5	E9	Capacity to implement projects in the area of industrial engineering.
5	T3	Capacity to monitor activities under the projects in the area of industrial engineering.
5	T4	Capacity for organization and planning in the field of business and other institutions and organizations.
5	T5	Ability to work in a multilingual and multidisciplinary environment.
6	CP5	Capacity for observation and critical analysis in a limited and specific area.
6	E5	Knowledge that enables the ability to make measurements, calculations, assessments, appraisals, surveys, studies, reports, work plans and similar work.
6	E6	Ease to handle specifications, regulations and mandatory standards.
7	T8	Ability to develop learning skills necessary to undertake further studies and to recognize the need for continuing training for appropriate professional development.
1-7	TFG1	Ability to develop an original exercise carried out individually, and present it and defend it before a university court, consisting of a project in the field of the specific technologies of Industrial Engineering professional nature, in which synthesize and integrate the skills acquired the teachings.

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Correlation between EAC ABET Program Educational Objectives and Outcomes

Program Educational Objectives		Program Outcomes							
		1a	1b	2	3	4	5	6	7
I	<i>Will successfully apply their skills to perform the characteristic tasks for the practice of Industrial Engineering.</i>	X	X						
II	<i>Will use the fundamentals of Industrial Engineering in the design, development and application of new products and processes to produce solutions in a wide range of business sectors.</i>	X	X	X				X	
III	<i>Will efficiently share information to diverse audiences and be able to develop their professional activities in multidisciplinary teams.</i>				X		X	X	
IV	<i>Will practice their profession as Industrial Engineers with a deeply-held sense of ethics, responsibility, respect for the environment and proper understanding of the impact of their work on the social and global economic development.</i>					X			
V	<i>Will pursuit additional educational activities for their proper professional development.</i>								X