**Diploma Supplement for the Department of Industrial Engineering and Management**

Graduates of this department will have general knowledge in the field, as detailed below, and specific knowledge in one of the three specializations listed, as chosen by each student.

**General Level**

Graduates will be able to:

1. Use analytical and engineering methods, supported by advanced information systems, to address a wide spectrum of issues including: process improvement, production planning and supervision, engineering design, quality assurance, project management, human factor engineering and human resources
2. Assess projects’ economic viability using statistical tools and methods relevant to mapping and analyzing organizational processes
3. Assess a situation existing in an organization and then: identify measurement indices; define requirements for a new information system; plan the system’s logic; plan data collection screens for the future system; design and configure a database; implement the design in a DBMS system environment; write complex queries that introduce, retrieve, and modify information stored in a database; and analyze transactions in a parallel processing environment
4. Work with supporting software (CASE tools) such as: EXCEL, SPSS, ARENA, ERP, CIM, Visio, BI Qlik Sense, MS-SQL, as well as open-source software systems for statistical calculations, data mining, data processing, building models, and machine learning

**Specialization: Products and Service in a Digital Environment**

Graduates of this specialization will be able to:

1. Analyze the factors that advance or hamper an organization's achievements; propose ways to increase outputs and reduce inputs; integrate the organization’s human resources with its technological and logistical resources
2. Analyze and improve an organization’s work processes; consider the technological, engineering, behavioral, and information systems by using statistical, analytical, heuristic, and simulation methods and tools
3. Analyze and improve organizational structures in a way that will serve its core processes

**Specialization: Information Systems Engineering**

Graduates of this specialization will:

1. Be familiar with the theoretical and practical aspects for all stages in an information system’s life cycle from initiation through full development
2. Be able to analyze the managerial and technological aspects of information; analyze problems and needs; assess an existing situation; analyze business processes and identify shortcomings; present a technological solution; develop a solution and make it accessible to the target users, according to their needs
3. Apply cutting-edge technological methods and tools that deal with information and information systems; integrate these methods and tools into business corporations and research and development institutions
4. Be familiar (from the client side and the server side) with various innovative software languages for developing Internet systems; the Full stack languages taught in this specialization include: JavaScript, ReactJS, HTML5, and C#
5. Manage and analyze data and information using SQL tools, BI, Big Data science, communication networks, and information security
6. Propose and develop an information system for a corporate client or a digital enterprise

**Specialization: Business Entrepreneurship and Technological Innovation**

After studying the specialization’s courses and completing the final project, graduates will:

1. Have a solid understanding of basic principles of entrepreneurshipandbusiness
2. Understand the major issues relevant to new business ventures
3. Be able to identify, evaluate, and assess entrepreneurs’ knowledge and abilities
4. Be able to observe, learn about, and be integrated into an entrepreneurial environment
5. Be able to develop and communicate business principles
6. Understand the primary resources that exist for creating a business model
7. Be able to create an economic business model

**Specialization: Data Science**

Graduates of this specialization will be able to:

1. Collect, clean, and analyze information from databases, especially Big Data
2. Apply descriptive statistics and statistical inference tools
3. Perform complex queries on relational and non-relational databases (noSQL)
4. Use algorithms from artificial intelligence and learning systems to promote an organization, create added value for it, and provide it with a competitive advantage
5. Develop models for predicting and identifying patterns, recommendation systems, etc.
6. Develop thinking strategies and algorithms based on data science and use the relevant tools to integrate them into technological projects in the field