

## BACHELOR OF SCIENCE IN COMPUTER SCIENCE

Business, service organizations, and public administration worlds have increasingly considered computer science skills necessary. The constant rapid evolution creates the need for computer specialists to enter the workforce. The Bachelor of Science Degree in Computer Science provides an essential methodological background, combined with an understanding of the latest technologies in various specialties, from business to public service and individual applications.

The student must choose a subject area for further study, viz:

### 1. Technologies for Digital Communication

This specialization enables students to acquire skills in the field of user-oriented digital application design. Students learn to devise interactive solutions in all the various stages of digital application design, applicable to different contexts. These phases include identifying the needs of specific target users, creating an application prototype, evaluating usability, and creating a promotional degree through digital channels. Students who choose this curriculum will gain an in-depth and integrated knowledge of the leading social research techniques and methodologies used to assess user needs (interviews, focus groups, questionnaires, interactive workshops, etc.) and learn to analyze the relevance of digitally available technologies-both "mobile" and related to the Internet of Things, Artificial Intelligence and Big Data-for, different categories of users.

### 2. Machine Learning and Artificial Intelligence

The Major in Machine Learning (ML) and Artificial Intelligence (AI) prepares students to create intelligent systems that perceive and respond to the world around them. ML and AI systems are everywhere, in our cars and smartphones, and companies of all sizes are investing in these areas. It combines the rigorous computer science degree with AI, ML, and Big Data courses while providing the necessary mathematics, Statistics, and data science skills.

### 3. Information and Knowledge

Prepares graduates capable of developing and managing complex information systems, emphasizing Web applications. The in-depth subject area pays special attention to the development of desktop and "mobile" applications of autonomous and intelligent systems, as well as the design of robust and flexible software architectures, efficient access to and thoughtful analysis of data aimed at improving the enjoyment of the large masses of information available online. It thus provides an essential preparation to meet the needs of the Information Society, suitable for continued study in the master's degree, coupled with a technical background designed to prepare the student for rapid entry into the world of work.

### 4. Languages and Systems

Prepares graduates to have a solid background in computer science, both from a foundational point of view and for the development of applications. This in-depth subject area provides many essential training elements in mathematics and physics and, as far as computer science is concerned, basic skills related to programming methodologies and computing systems. It also delves deeper into programming languages and computing systems.

### 5. Networks and Information Systems

This in-depth subject area aims to train individuals competent in software systems' design, management, and control. As proficient in operating systems, networks and security, programming languages and environments, and databases, these figures will be able to contribute to the management of computerization in small businesses and public administration and to actively insert themselves in the projects of large companies for the development and management of complex software systems.

## EDUCATIONAL OBJECTIVES AND METHODOLOGY

The objective of the degree program is to acquire the skills necessary both for rapid entry into the world of work in the field of information and communication technologies and to enable the graduate to follow the rapid technological evolution and to adapt to a wide variety of work realities. Graduates in Computer Science will be able to use the knowledge and skills acquired in the design, development, and management of computer systems; they will have the skills needed to address and analyze problems in application contexts and to develop troubleshooting solutions.

## JOB OPPORTUNITIES

The Bachelor of Science in Computer Science provides broad-based knowledge alongside elements of professional training to enable continuation in higher studies while offering entries into the world of work. Graduates in Computer Science will carry out professional activities in the areas of design, organization, and management of computer systems in companies producing hardware/software in the areas of computer systems and networks as well as in companies that are information technology-based, e.g., banks, insurance companies, public bodies. In addition, skills acquired during the degree program allow for the initiation of self-employed professional activities. The Bachelor of Science in Computer Science prepares for the following professions: Software Analysts and Designers, System Analysts, Web Application Analysts and Designers, Network and Computer Communications Specialists, Database Analysts and Designers, Systems Administrators, Programming Technicians, Application Technicians, Web Technicians, Database Management Technicians, Network Systems Management Technicians.

## CURRICULAR PROGRAM

Students must complete these curricula requirements:

### A. THE GENERAL EDUCATION REQUIREMENTS (30 CH)

#### **Humanities and Fine Arts**

ENG/110 - English Composition III

ENG/390 - Public Speaking

One course in English Literature

#### **Social and Behavioral Sciences/Business**

LAW/100 - International Law

SOC/300 - Sociology of Media and Communication

#### **Mathematics, Natural Science and Computer Science**

COM/100 - History of Computer Science

One course in Mathematics

One study in Natural Science

#### **Writing Intensive**

ENG/320 - Digital Linguistic and Technical Writing (W)

#### **Global Perspectives/Diversity**

POL/200 - Global Poverty and International Responsibility (G)

### B. CORE CURRICULUM (45 CH)

COM/140 - Programming I

COM/220 - Programming II

COM/290 - Operating Systems

COM/300 - Databases

COM/330 - Architecture of Computers

COM/350 - Formal Languages and Compilers

COM/380 - Algorithms and Data Structure

ECO/350 - Management, Business Administration, and Computer Law

MAT/150 - Foundations of Probability and Statistics

MAT/190 - Matrix Calculus and Operational Research

MAT/200 - Logic for Computer Science

MAT/330 - Mathematical Analysis

PHY/200 - Physics

COM/495 - Senior Project (6 CH)

**C. MAJOR AREA CURRICULUM (21 CH)** - Students must select one of the following concentration areas:**Innovative Technologies for Digital Communication**

BUS/400 - Social Media Management  
COM/200 - Information Technologies and Digital Applications  
COM/210 - Digital Media Design  
ECO/300 - Digital Economy and Marketing I  
ECO/400 - Digital Economy and Marketing II  
PSY/320 - Psychology of Innovation  
SOC/370 - Corporate and Institutional Communication

**Machine Learning and Artificial Intelligence**

COM/110 - Introduction to Artificial Intelligence and Machine Learning  
COM/170 - Artificial Intelligence and Machine Learning applied to Business  
COM/280 - Data Mining  
COM/320 - Programming III  
COM/440 - Advanced Control System  
COM/460 - Neural Networks and Deep Learning  
LAW/320 - Ethical and Legal Aspects of Artificial Intelligence-Based Technologies

**Information and Knowledge**

COM/320 - Programming III  
COM/340 - Development of Software Application  
COM/370 - Intelligent Systems  
COM/390 - Human-Computer Interaction and web technologies  
COM/400 - Information Systems  
COM/420 - Formal Methods in Computer Science  
COM/440 - Advanced Control System

**Languages and Systems**

COM/310 - Programming Languages and Paradigms  
COM/320 - Programming III  
COM/340 - Development of Software Application  
COM/360 - Frequency and Spectral Allocation: Wireless Systems  
COM/420 - Formal Methods in Computer Science  
COM/480 - Programs Languages  
COM/490 - Embedded System: Common Features and Operating Environments

**Networks and Information Systems**

COM/190 - Computer Networks I  
COM/320 - Programming III  
COM/340 - Development of Software Application  
COM/430 - Web Technologies  
COM/450 - Computer Networks II  
COM/470 - Computer and Network Security  
MAT/320 - Computability and Complexity

**D. GENERAL ELECTIVES:** it is sufficient to complete an overall total of 120 credit hours.