BACHELOR OF SCIENCE IN COMPUTER SCIENCE

Businesses, service organizations, and public administration have increasingly considered computer science skills necessary. The constant rapid evolution has created a need for computer specialists to enter the workforce. The Bachelor of Science Degree in Computer Science provides a foundational methodological background and an understanding of the latest technologies in various specialties, ranging from business to public service and individual applications.

The student must choose a subject area for further study

Concentration in E-Commerce and Digital Communication

The concentration courses in E-Commerce and Digital Communication focus on user-oriented design of digital applications. Students learn various stages of digital application design and their contexts, from identifying users' needs, creating application prototypes, assessing usability, generating promotional materials through digital channels, analyzing effectiveness, and maintaining customer relations. E-Commerce and Digital Communication program students will be well-prepared for various careers in the rapidly growing online business and communication field. They may pursue roles as e-commerce managers, digital marketing specialists, web developers, data analysts, social media managers, or other related positions.

Concentration in Machine Learning and Artificial Intelligence

The Machine Learning and Artificial Intelligence program covers various topics, including machine learning, deep learning, natural language processing, and Computer vision. It combines rigorous computer science skills with machine learning (ML) and artificial intelligence (AI), while providing the necessary mathematics, Statistics, and data science skills. The demand for professionals with expertise in machine learning and artificial intelligence is increasing, as these skills are in high demand across many industries. Graduates will be prepared for various careers, including those in machine learning engineering, data science, artificial intelligence, computer vision, and natural language processing.

Concentration in Information and Data Analytics

The Information and Data Analytics program offers a solid foundation for a range of exciting careers in the rapidly growing field of data analytics. It covers multiple topics, including data analysis, data mining, statistical modeling, data visualization, and programming languages like Python and R. The program is designed to equip students with the knowledge and skills necessary to work with large datasets and extract meaningful insights. Graduates will be well-prepared for various careers, including data analysts, data scientists, business intelligence analysts, and data engineers.

Concentration in Networks and Cybersecurity

The Network and Cybersecurity program equips students with the skills and knowledge required to work in the rapidly growing field of cybersecurity. The program encompasses a wide range of topics, including network security, cryptography, ethical hacking, incident response, and risk management. Graduates of the program will have the skills and knowledge necessary to secure computer networks from unauthorized access, identify vulnerabilities in computer systems and networks, and respond to security incidents. Some possible career paths include cybersecurity analyst, information security manager, penetration tester, and incident response specialist. Graduates will have the skills and knowledge to make a positive impact in the organizations they work for.

Educational Objectives and Methodology

The objective of the degree program is to equip graduates with the skills necessary for both rapid entry into the workforce in the field of information and communication technologies and to enable them to keep pace with the rapid technological evolution and adapt to a wide variety of work realities. Graduates in Computer Science will be able to apply the knowledge and skills acquired in the design, development, and management of computer systems; they will possess the skills necessary to address and analyze problems in application contexts and develop troubleshooting solutions.

Career Opportunities

The Bachelor of Science in Computer Science provides a broad-based knowledge foundation, complemented by elements of professional training, enabling students to continue their studies in higher education while also providing a pathway into the workforce.

Graduates in Computer Science will conduct professional activities in designing, organizing, and managing computer systems in companies producing hardware, software in computer systems and networks, and information technology-based companies, e.g., banks, insurance companies, and public bodies. Additionally, skills acquired during the degree program enable 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 Programs

Students must complete these curriculum requirements:

A. General Education Requirements (30 CH)

- COM 105 - Introduction to Computer Science
- ENG 110 - English Composition III (W)
- ENG 320 - Digital Linguistic and Technical Writing (W)
- ENG 390 - Public Speaking
- LAW 100 - International Law
- MAT 190 - Matrix Calculus and Operational Research
- One course in Literature
- PHY 200 - Physics
- POL 200 - Global Poverty and International Responsibility (G)
- SOC 300 - Sociology of Media and Communication

B. Core Curriculum (36 CH)

- COM 110 - Introduction to Artificial Intelligence and Machine Learning
- COM 120 - Introduction to Web Design
- COM 140 - Programming I
- COM 150 - New Media
- COM 180 - Data Analytics for Economics and Business
- COM 190 - Computer Network and Cloud Computing
- COM 250 - Introduction to Digital Imaging and Visualization
- COM 270 - Management Information System
- COM 290 - Operating Systems
- COM 300 - Database and Data Management
- COM 330 - Architecture of Computers
- COM 390 - Human-Computer Interaction

C. Concentration Requirements (30 CH) - Students must select one of the following concentration areas:

E-Commerce and Digital Communication

- COM 210 - E-commerce Strategies and Models
- COM 220 - Programming II
- COM 240 - Digital Marketing
- COM 241 - Social Media and Networking
- COM 242 - Mobile Application Development
- COM 243 - Electronic Payment Systems
- COM 305 - Web Analytics
- COM 315 - Digital Content Management
- COM 325 - Information Visualization
- COM 335 - Customer Relationship Management

Machine Learning and Artificial Intelligence

- COM 170 - Artificial Intelligence and Machine Learning Applied to Business
- COM 220 - Programming II
- COM 251 - Natural Language Processing
- COM 252 - Computer Vision

- COM 253 - Robotics and Automation
- COM 280 - Data Mining and Knowledge Discovery
- COM 345 - Reinforcement Learning
- COM 350 - Explainable Artificial Intelligence
- COM 410 - Learning Analytics
- COM 460 - Neural Networks and Deep Learning

Information and Data Analytics

- COM 220 **-** Programming II
- COM 281 - Data Management and Warehousing
- COM 282 - Business Intelligence
- COM 283 - Predictive Analytics
- COM 284 - Data Visualization
- COM 285 - Statistical Methods for Data Science
- COM 370 - Data Ethics and Privacy
- COM 375 - Text Analytics
- COM 380 - Time Series Analysis
- COM 385 - Multivariate Analysis

Network and Cybersecurity

- COM 220 - Programming II
- COM 291 - Cybersecurity Fundamentals
- COM 292 - Digital Forensics
- COM 293 - Intrusion Detection and Prevention
- COM 294 - Penetration Testing and Ethical Hacking
- COM 296 - Security Management and Risk Assessment
- COM 355 - Cryptography and Network Security
- COM 365 - Advanced Network Security
- COM 450 - Network Protocols and Architecture
- COM 470 - Computer Network Security

D. Concentration Electives: (21 CH). Students will choose seven courses in this area sufficient to complete a combined total of 120 credits:

- COM 320 - Programming III
- COM 340 - Development of Software Applications
- COM 360 - Frequency and Spectral Allocation: Wireless Systems
- COM 401 - Information Technology in Healthcare
- COM 402 - IT Service Management
- COM 403 - Geographic Information Systems
- COM 404 - Virtual Reality and Augmented Reality
- COM 405 - Emerging Technologies
- COM 406 - Knowledge Management
- COM 407 - Information Technology Auditing and Assurance
- COM 420 - Formal Methods in Computer Science

E. Capstone Requirement (3 CH)

COM 495 - Senior Project