Skills and career opportunities

Competencies

Basic Competencies

- Students have demonstrated knowledge and understanding of an area of study that builds on the foundation of general secondary education and is usually at a level which, while relying on advanced textbooks, also includes some aspects that involve knowledge from the forefront of their field of study.

- Students can professionally apply their knowledge to their work or vocation and possess the competencies that are usually demonstrated through the problem-solving, development and defense of arguments and within their field of study.

- Students are capable of compiling and interpreting relevant data (usually within their area of study) to make judgments that include a reflection on relevant social, scientific, or ethical issues.

- Students can communicate information, ideas, problems, and solutions to both specialist and non-specialist audiences.

- Students have developed the necessary learning skills to undertake further studies with a high degree of self-direction.

Core Competencies

- Understanding, planning and solving problems through the development of IT solutions.

- Developing IT solutions that are respectful of the environment, social concerns, and natural resources, in addition to complying with legislation and ethics.

- Applying scientific fundamentals to solve computer problems.

- Understanding the complexity, simplification and optimization of computer systems.

- Managing human and technological resources for the proper implementation of computer projects.

- Working in multidisciplinary environments and demonstrating teamwork skills, versatility, flexibility, creativity, and respect for the work of colleagues in other disciplines.

- Applying the creative fundamentals of idea generation in software development projects for digital environments.

- Being aware of the work environment, employability resources, and legal framework of the sector.

- Learning, modifying, and producing new computer technologies.

- Applying creative techniques for the realization of computer projects.

- Researching, analyzing, and managing information to learn from it.

- Analyzing a situation in general and, based on the collected data, making decisions about the corresponding digital project with respect to the target audience and defined business model.

- Developing and applying critical thinking in social and interpersonal contexts, in order to be able to develop in an information and knowledge society.

Transversal Competencies

- Knowing definition, scope and implementation of the fundamentals of technology development project management methods.

- Being familiar with the key actors in the sector and the complete life cycle, from development to commercialization, of digital content.

- Keeping up to date with the use of digital tools and technologies according to the current state of the sector and new technologies.

- Possessing the necessary skills for digital entrepreneurship.

Specific Competencies

- Knowing the structure of computers, the concepts of information encoding, manipulation, processing, and the use of basic level languages.

- Understanding and managing the various tools available for storing, processing, and accessing structured information systems.

- Designing normalized database schemas using entity-relational models and relational algebra, as well as performing queries using procedural languages.

- Creating relational databases using a graphical interface and creating queries, forms, and reports.

- Designing and implementing web applications on both client and server side, using standard scalable technologies.

- Developing dynamic web applications that use asynchronous client-server communication mechanisms and package them for mobile platforms.

- Identifying the main data structures, libraries, and algorithmic techniques, as well as their orders of complexity.

- Understanding the various paradigms behind programming languages.

- Understanding control structures, variables, programming syntax, and effective memory usage management in the development of a computer application.

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- Automatically generating documentation of an application, as well as understanding and properly managing version control.

- Understanding the need and architecture of Operating Systems and the various mechanisms for process management, communication, and synchronization.

- Administering a server or a small computer network and automating these tasks.

- Understanding the fundamentals of computer networks, the different topologies, and their communication protocols.

- Knowing the technologies used in communication between computers, as well as how to configure a TCP/IP network and basic services.

- Developing distributed applications, taking into account fault tolerance, adaptability, load balancing, and system predictability.

- Managing memory, Input-Output resources, and the files and security mechanisms that an Operating System must provide.

- Developing applications that use the parallelization features of high-performance graphics cards and architectures.

- Designing architecture of an object-oriented computer application using the most appropriate design patterns and integrating them into the complete architecture.

- Conceiving, designing through graphic languages, and implementing a computer application using different development methodologies, from the conception of the product to its final development, through the definition of its phases and iterations.

- Testing the operation and functionality of a computer application in depth, developing test plans and using design techniques and test-oriented programming.

- Assessing the quality of a computer application from the point of view of its design and implementation, and applying metrics, procedures, and software quality measurement standards.

- Knowing the techniques and implications of computer application maintenance, including those that use reverse engineering principles, to understand and modify software with unknown structure.

- Knowing the principles of artificial intelligence, and using deterministic search algorithms and state machines.

- Knowing the mathematical foundations of computer engineering.

- Understanding the fundamentals of visual languages, visual creation techniques, and their associated tools.

- Applying the fundamentals of human-machine interaction in developing projects within the framework of the digital economy.

- Applying methods and techniques related to the conceptualization, design, analysis, and evaluation of usable and accessible interactive products.

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- Knowing the global needs of industries and economies, as well as globalization, its consequences, and applications in international business.

Competencies of the Minor in Data Engineering

- Knowing the principles of non-relational databases, their typologies and the possibilities of their distributed storage or processing.

- Understanding the principles and techniques of pattern detection in massive amounts of data.

- Knowing the main characteristics of the different types of data ingestion, storage, and processing.

- Knowing and applying different search algorithms and retrieving textual and non-textual information.

- Knowing and applying the various automatic learning algorithms, including both supervised and unsupervised learning.

Competencies of the Minor in Computer Graphics Programming, Immersive Systems and Simulation
- Knowing the principles of design, development, and deployment of video games.
- Understanding the different computational techniques of projection,
- transformation, and visualization of three-dimensional information.
- Understanding and applying the physical principles of character behavior and virtual object interaction.
- Understanding the fundamentals of immersive systems and be able toimplement them.

Competencies of the Minor in Cybersecurityering

- Knowing the fundamental elements and actors involved in information security.
- Knowing the legal and regulatory framework and the commonly applied technical standards in the field of cybersecurity.
- Knowing the basics of cryptography and its application in software development.
- Understanding and applying techniques and best practices for secure software development.
- Understanding and applying intrusion techniques and methodologies in information systems.
- Understanding and applying forensic analysis techniques and methodologies in information systems.
- Understanding and applying assurance and protection techniques in information systems.

Professional opportunities

- Technology Director

- Engineering Project Manager

- Software Developer/Architect

- Video Game and Virtual Reality Programmer

- Expert in Artificial Intelligence

- Application Developer

- Technology Director

- Engineering Project Manager

- Software Developer/Architect

- Video Game and Virtual Reality Programmer

- Expert in Artificial Intelligence

- Application Developer

- Cybersecurity Expert

- Big Data Expert

- Technology Director

- Engineering Project Manager

- Software Developer/Architect

- Videogame and Virtual Reality Programmer

- Artificial Intelligence Expert

- Application Developer

- Cybersecurity Expert

- Big Data Expert