

Master of Science in Software Engineering with a Concentration in Artificial Intelligence

Program Overview

The Master's in Software Engineering with a focus on Artificial Intelligence is a graduate program designed to develop professionals with advanced skills in software development and the application of artificial intelligence (AI) technologies. This program meets the growing demand for experts who can design innovative technology solutions that combine high-quality software with intelligent capabilities.

With a rigorous and dynamic approach, students will be prepared to tackle today's and tomorrow's technology challenges. By pairing software development with artificial intelligence, graduates will be ready to lead and reshape the tech industry. This program not only strengthens technical skills and expands career opportunities, but also enables graduates to play an active role in the technological revolution transforming the world.

The primary aim of this master's program is to prepare highly qualified professionals who can lead and deliver complex projects in software development and artificial intelligence.

Program Objective

Prepare expert professionals in software engineering and artificial intelligence, able to design, develop, and implement innovative technology solutions that meet market needs and contribute to technological progress.

Program Description

The program provides a well-rounded education that blends theory and hands-on practice in core areas such as software development, artificial intelligence algorithms, machine learning, natural language processing, and intelligent systems. Students will learn to use advanced tools and technologies to build applications that are both effective and efficient. In addition, teamwork and interdisciplinary collaboration are emphasized, preparing graduates to lead projects in fast-paced, evolving environments.

Master of Science in Software Engineering in Artificial Intelligence

The Master's in Software Engineering with a specialization in Artificial Intelligence is a graduate program designed to develop professionals with advanced skills in software development and the application of AI technologies. This program meets the growing demand for experts who can create innovative technology solutions that combine high-quality software with intelligent capabilities. It is a rigorous, fast-moving program that prepares students to take on today's technological challenges and those of the

future. With a focus on integrating software and artificial intelligence, graduates will be prepared to lead and reshape the tech industry. It not only strengthens technical skills and opens up career opportunities, but also enables graduates to be part of the technology revolution transforming the world.

The main goal of this Master's in Software Engineering with a specialization in Artificial Intelligence is to develop highly skilled professionals who can lead and carry out complex projects in software development and artificial intelligence.

Course Methodology

The program's methodology is built around a hands-on, collaborative approach. Courses will include:

- Theoretical classes: Providing a strong foundation in core concepts.
- Hands-on projects: Where students will put their knowledge to work in real-world situations.
- Case studies: Designed to help analyze and solve complex problems.

- Teamwork: Encouraging collaboration among students to build strong interpersonal skills.
- Leveraging emerging technologies: Incorporating the latest industry tools to ensure graduates stay current with the newest trends.

This approach ensures graduates gain not only technical knowledge, but also hands-on skills that help them stand out in software engineering and artificial intelligence.

	Nombre del curso	Código	Créditos
1° Periodo Académico	Advanced Computer Structures	CSE6011	3
	Professional Issues in Computing	CSE6012	3
2° Periodo Académico	Innovative systems analysis and design	CSE6021	3
	Software Engineering: Advances and Trends	CSE6022	3
3° Periodo Académico	Artificial Intelligence for Digital Transformation (*)	CIA6031	3
	No-Code and Low-Code Platforms for Business Process Optimization (*)	CIA6032	3
4° Periodo Académico	Research Methodology	CSE6051	3
	Integrative Project: Applied Artificial Intelligence in Enterprise Systems (*)	CIA6042	3
5° Periodo Académico	AI Systems and Enterprise Data Architecture (*)	CIA6041	3
	Web Applications, Languages and Interchange Forms	CSE6052	3
6° Periodo Académico	Human-Computer Interaction, and Digital Citizenship	CSE6061	3
	Thesis	CSE6062	3

(*) Courses replacing the set of Concentration courses related to the standard MS in Computer Software Engineering.

CSE6011 - Advanced Computer Structures: The Computer Structures course focuses on the architecture and operation of computer systems. Students will explore the Von Neumann architecture, the programming model, and microarchitecture, as well as addressing modes and the instruction set. The course also covers storage systems and memory hierarchies, including cache and input/output devices. Through hands-on assembly language labs, participants will build the skills to program and understand how hardware and software interact.

CSE6012 - Professional Issues in Computing: This course offers a comprehensive overview of the ethical, legal, and professional dimensions in the field of computing. Students will examine the ethical responsibilities of technology professionals, along with legal considerations related to privacy, intellectual property, and cybersecurity. The course also supports the development of communication and teamwork skills, preparing participants to navigate workplace challenges in today's tech environment.

CSE6021 - Innovative systems analysis and design: This Systems Analysis and Design course focuses on the methods and techniques needed to build effective information systems. Students will learn how to conduct a thorough requirements analysis for projects, design appropriate technology solutions, and use UML models to visually represent systems. Through case studies, the course explores both agile and traditional approaches to software development, highlighting the importance of the development life cycle.

CSE6022 - Software Engineering: Advances and Trends: This course introduces students to the core principles of software engineering. Topics include the software life cycle, agile methods, version control, and project management. Participants will learn to design, build, and maintain software using modern tools, while applying best practices to ensure a high-quality final product. The course includes hands-on projects that let students apply what they learn in real-world scenarios.

CIA6031 - Artificial Intelligence for Digital Transformation: This course is designed to give students a strong, in-depth understanding of how artificial intelligence (AI) can drive digital transformation across organizations. Participants will learn how to implement AI to automate workflows, boost efficiency, and spark innovation across key business functions. Practical use cases and ethical challenges related to applying AI in business settings will also be explored.

CIA6032 - No-Code and Low-Code Platforms for Business Process Optimization: This course equips professionals to use no-code and low-code platforms to streamline and optimize business processes. Participants will learn how to spot processes that can be improved with these tools, building applications that increase operational efficiency and support a more collaborative way of working.

CSE6051 - Research Methodology: The course provides a thorough introduction to the design, implementation, and management of databases. Students will learn about relational models, normalization, SQL queries, and administration of the database management system. Through hands-on exercises, they will build the skills needed to design efficient databases that meet organizational needs.

CIA6042 - Integrative Project: Applied Artificial Intelligence in Enterprise Systems: This course enables students to apply artificial intelligence technologies and techniques in a capstone-style integrative project that tackles real-world challenges within organizations. Participants will learn

to identify opportunities where AI can streamline processes, and they'll build hands-on skills in choosing and using the right tools.

CIA6041 - AI Systems and Enterprise Data Architecture: This course focuses on the hands-on application of data science techniques to tackle real-world challenges in the business environment. Students will learn to work with large-scale datasets using advanced tools to spot trends and improve processes. It covers practical topics such as predictive analytics and strategic improvement through data-driven segmentation.

CSE6052 - Web Applications, Languages and Interchange Forms: This course examines how XML is used in web development. Students will learn to build web applications that use XML to exchange data across systems. Topics include XSLT, XPath, and web services, enabling participants to create interactive solutions based on open standards.

CSE6061 - Human-Computer Interaction, and Digital Citizenship: This course focuses on user-centered design and the interaction between people and computers. Students will explore core UX/UI design principles, along with topics related to digital citizenship, tech ethics, and digital inclusion. A critical perspective will be encouraged on the social and cultural impact of technology use.

CSE6062 - Thesis: The course concludes with the completion of a thesis that brings together the knowledge gained throughout the program. Students will develop an original project that addresses a relevant challenge in the computing or technology field, applying scientific methods to support their research.