

## Mode

Online

## Language

Spanish

## Duration

18 months

## Course Descriptions

- **CSE611 Computer Structures (3 Credits)** The objective of this course is to provide a comprehensive overview of fundamental software and hardware technologies. It will provide students with a solid theoretical and practical foundation on which to build their understanding of future technical developments. The course will cover the key concepts in computer structures, including hardware technologies and components, as well as the fundamentals of software systems and architectures. Students will gain knowledge of the interaction between software and hardware in a computer system and develop an in-depth understanding of how these key components function and integrate. Upon completion of the course, students will be prepared to analyze and understand the underlying structures and technologies in computer systems, enabling them to adapt to and understand future technical developments more effectively.
- **CSE612 Professional Aspects of Information Technology (3 Credits)** This course provides a broad understanding of the social and legal context in which information technology operates. Students will examine the relationship between information technology, society and the law. It helps develop an understanding of external issues affecting information systems and organizations, provides an overview of professional and ethical issues, and develops the skills necessary to manage systems effectively and sensitively to their operating environment. Throughout the course, students will analyze the ethical and legal challenges related to computer science, understand the social implications of information technology, and acquire the skills necessary to address and solve professional problems in the field of computer science. Upon completion of the course, students will be prepared to make informed and ethical decisions in their professional practice in the field of computer science.

- **CSE621 Systems Analysis and Design (3 Credits)** The purpose of this course is to help students develop the fundamental skills to understand complex systems and problems, and create effective automated solutions. This course takes a modern object-oriented approach to modeling systems and producing software package designs that can automate those systems. It will provide the skills necessary to master these techniques, as well as the ability to use the Unified Modeling Language (UML) to describe these models. Throughout the course, students will learn to analyze existing systems, identify requirements, design effective solutions, and create models using UML. Techniques and tools for user interface design and software lifecycle management will also be explored. Upon completion of the course, students will be prepared to apply systems analysis and design techniques in software development environments and generate efficient and well-designed automated solutions.
- **CSE622 Software Engineering (3 Credits)** The purpose of this course is to provide a solid theoretical foundation and practical skills in software engineering. This course covers the theoretical foundations and practice of the three key phases of problem definition, software development and maintenance. The students will acquire the skills necessary to lead a programming project and deliver products on time and on budget. Throughout the course, various methodologies and techniques used in software engineering will be explored, including the software development life cycle, requirements management, system design and implementation, software verification and validation, and software maintenance. Students will also learn about best practices in project management and collaboration in software development teams. Upon completion of the course, students will be prepared to meet the challenges of software development effectively and apply the principles and techniques of software engineering to achieve successful results.
- **CSE631 IT Project Management (3 Credits)** The purpose of this course is to provide a complete understanding of the roles, responsibilities and management techniques required in software technology projects. This course shows how technology project management adapts to the evolution of a computer system from the concept to implementation. Throughout the course, students will explore the fundamentals of project management, including planning, monitoring and controlling, resource allocation, time and budget management, and risk management. Specific topics related to IT project management will also be addressed, such as project management. scope, quality management, communication management and stakeholder management. Students will learn to apply project management methodologies and frameworks, such as the PMBOK (Project Management Body of Knowledge) approach and Agile, in the context of software technology projects. Upon completion of the course, students will be prepared to effectively manage IT projects and address the specific challenges associated with managing software technology projects.

- **CSE632 Quality Management and Software Testing (3 Credits)** The purpose of this course is to provide a comprehensive understanding of how to ensure software quality, including testing, maintenance, and effective management. This course provides the techniques necessary to design and implement tests, perform inspections, and employ launch and maintenance procedures. It also addresses key aspects of managing the quality assurance process. Throughout the course, students will learn about different approaches and methodologies to ensure software quality, including white box and black box testing, unit testing, integration testing, system testing, and acceptance testing. Topics related to software quality management will also be explored, such as test planning and scheduling, defect and problem management, and the implementation of quality standards and good practices in software development. Upon completion of the course, students will be prepared to apply testing techniques and manage software quality effectively in a professional environment.
- **CSE641 Object-Oriented Programming (3 Credits)** This course provides a theoretical and practical understanding of object-oriented programming and design. Students will develop essential problem-solving and programming skills necessary to write well-structured object-oriented programs. They will also explore many other important techniques, such as modern distributed systems and component technology, based on the concepts that have made object-oriented programming the predominant method of software development today. Throughout the course, students will learn the fundamental principles of object-oriented programming, including encapsulation, inheritance, and polymorphism. They will also become familiar with key concepts and tools used in object-oriented programming, such as classes, objects, methods, attributes, and relationships between objects. Through practical exercises and projects, students will apply their knowledge in solving problems and implementing solutions using object-oriented programming. Upon completion of the course, students will be prepared to design and develop robust and scalable programs using the principles of object-oriented programming.
- **CSE642 Internet Programming (3 Credits)** The purpose of this course is to provide students with the theoretical and practical tools necessary to build advanced, content-rich websites. At the end of the course, students will be able to design and create an advanced website and will be prepared to undertake complex projects on the Internet. During the course, students will learn the fundamentals of web programming, including programming languages and technologies used in website development. They will explore concepts such as user interface design, content structure and organization, interactivity, security, and accessibility in website programming. They will also acquire practical skills in the use of specific tools and techniques for advanced website development, such as database manipulation, multimedia integration and the implementation of interactive functionalities. Through hands-on projects and exercises, students will apply their knowledge and develop advanced websites that meet the standards of the industry and user needs. At the end of the course, students will be prepared to face challenges in the development of complex websites and will be able to apply their skills in the world of work or undertake self-employed projects in the field of internet programming.

- **CSE651 Databases (3 Credits)** The purpose of this course is to equip students with a complete understanding of the fundamental principles of database construction and use. As already dominant database technology continues to develop, students will analyze how data is stored, manipulated, queried (with an emphasis on relational databases), and supported. They will also become familiar with various paradigms and technologies (both parallel and distributed) related to database design, implementation, and maintenance. During the course, students will learn the basics of data modeling, database design, and structured query language (SQL). They will explore how information is organized and managed in a database environment, including creating tables, defining relationships and constraints, and performing complex queries to extract specific information. Additionally, advanced database design techniques, such as normalization and performance optimization, will be examined. Students will also gain knowledge of database administration, including security, backup, and data recovery. Through hands-on projects and exercises, students will apply their knowledge in building and manipulating real databases, and develop practical skills in using database-related tools and technologies. Upon completion of the course, students will be prepared to design and manage efficient and effective databases, and will be able to apply their skills in various professional environments that require the management of large volumes of data.
- **CSE652 XML Web Applications (3 Credits)** This course provides an overview of the uses of the XML language and its role in the next generation of e-commerce applications. This module provides an understanding of the fundamental XML technologies, the standardized development environment they offer, and their implications for future developments of internet applications. During the course, students will explore the basic concepts of the XML language, including the syntax and structure of XML documents, as well as associated technologies, such as DTD (Document Type Definition) and XML Schema. The concepts of transformation and presentation of XML data using XSL (Extensible Stylesheet Language) will also be addressed. Students will learn how to use XML in web application development, including creating valid XML documents, manipulating and transforming XML data, and integrating XML with other web languages and technologies, such as HTML, CSS, and JavaScript. Additionally, specific use cases for XML will be explored in the context of e-commerce applications, such as exchanging data between systems, managing product catalogs, and implementing web services. Through practical projects, students will apply their knowledge in the design and development of web applications that use XML as a data format. Upon completion of the course, students will be prepared to use XML effectively in web application development and will understand the impact of XML on the future of Internet applications.
- **CSE661 Human-Computer Interaction and Digital Citizenship (3 Credits)** The purpose of this course is to provide an understanding of the design, evaluation and development of usable interactive application interfaces. This course provides a solid foundation in human-computer interaction. This course has also been developed to raise awareness of the issue of creative content and encourage a better understanding of the rights associated with it. Ultimately, its goals are to instill in students an appreciation of the value that creative content has to the creator and to establish a personal respect for creative rights in a way that changes their behaviors and perceptions of digitally delivered content. During the course, students will explore key concepts of human-computer interaction, such as usability, user experience, user-centered design, and accessibility.

They will learn techniques and methods to evaluate and improve the usability of interactive application interfaces, as well as to design interfaces that meet the needs and expectations of users. In addition, the course will address the topic of digital citizenship and intellectual property rights in the digital environment. Students will reflect on the ethical and legal issues related to the use and distribution of creative content online, and will be encouraged to develop a responsible and respectful attitude towards copyright and other aspects of digital citizenship. Through practical projects and discussion activities, students will apply their knowledge in the design and evaluation of interactive application interfaces, as well as in the analysis and reflection on issues of digital citizenship and intellectual property rights. Upon completion of the course, students will be equipped with the skills and knowledge necessary to design and develop application interfaces, usable interactive materials **and will understand the importance of ethics and copyright in the digital environment.**

- **CSE662 Thesis (3 Credits)** The thesis project serves as the culmination of the entire program. The student must successfully complete this requirement with a grade of B or better to graduate. A successful project begins with a well-written proposal that is approved by the major professor. Once the proposal is approved, the student conducts research to support his/her work. This project should highlight the disciplinary competencies the student acquired throughout the program. At the end of the project, the student presents his/her findings to the major professor. This final oral presentation is part of the project. APA (American Psychological Association) guidelines must be followed.