School	Arts and Sciences		
Major	Master of Computer Science		
Core Requirements			
Code	**Title**	**Credits**	**Description**
CSCI510	Design and Analysis of Algorithm	3	This course introduces theoretical techniques to support the design and analysis of algorithms. Students learn how to develop efficient algorithms for simple computational tasks and reasoning about correctness. Topics include introduction to algorithms, asymptotic complexity, sorting and searching, divide and conquering, greedy graph algorithms, and dynamic programming.
CSCI511	Distributed Operating Systems	3	This course provides an in-depth examination of the principles of distributed systems in general and distributed operating systems in particular. Covered topics include processes and threads, concurrent programming, distributed inter-process communication, distributed process scheduling, virtualization, distributed file systems, distributed middleware and applications such as the web and peer-to-peer systems. Some coverage of operating system principles for multiprocessors will also be included. A brief overview of advanced topics such as cloud and cluster computing.
CSCI512	Information Retrieval	3	The course introduces students to the concepts of Information Retrieval and Search Engines. It covers indexing and creating an inverted file in Boolean and Vector models. Students will build a pilot search engine and test it on five datasets: Medline, composed of 1033 documents; CRAN, composed of 1400 documents, CISI, composed of 1460 documents, LISA, composed of 5872 documents; and NPL, composed of 11429 documents. Search Engines are evaluated using two well-known measures: Precision and Recall. Additional techniques are introduced to improve the performance of search engines, such as relevance feedback and dimensionality reduction in latent semantic indexing.
CSCI513	Advanced Database Systems	3	This course presents advanced concepts in database systems. We present a quick overview of relational DBMS including the relational model, relational algebra and relational calculus. Then, we will discuss fundamental notions of distributed database design (global directory, query processing) in large scale environments (e.g. Grid and Peer-to-Peer). We will focus on the very hot problem of query optimization by discussing the current approaches in this field. Finally, we will be introducing the strategies of data replication using SQL server.
CSCI514	Advanced Computer Networks	3	This course helps students develop the skills needed for advanced networks career opportunities and entry-level preparation for relevant research work. It provides theoretically rich, hands-on practices to advanced computer networks, in a logical sequence in presenting the underlying concepts used in nowadays large-scale networks and at the providers' level, altogether with practical skills driven by Cisco technology and basic research skills.
CSCI515	Computer Ethics	3	To teach students about social, legal, philosophical, political, constitutional, and economical issues related to computers and to prepare students for careers in computer science and other fields who are interested in issues that arise from computer technology. The course focuses on ethical issues that students might face directly as computer professionals, in addition to social, political, and legal issues related to computers. Students are required to prepare a term paper as a project, oral presentations and participate in debates.
CSCI612	Professional Issues in Computing	3	This course will help the student prepare his/her Master thesis by introducing several research methodologies that can be used in the Computer Science field. The course mainly includes two objectives: how to read a paper and how to write a paper. First, the student will learn how to read a scientific paper (e.g. journal, conference) including typically: the abstract, the introduction, the proposal (e.g. new technique, method, approach, framework), the related works (bibliography), the performance evaluation (experiments/simulations) ...etc. The student should be able to compare and classify papers in expertise. The final objective is to learn how to write a scientific paper with all the challenges for this purpose.
CSCI637	Core foundation of modern AI	3	This course provides an accessible introduction to Artificial Intelligence (AI), focusing on how intelligent agents perceive, learn, and make decisions in uncertain environments. Students will explore fundamental AI concepts, including agent-based reasoning, reinforcement learning (RL), and real- world AI applications. The course balances theory with visual and intuitive examples.
Major Requirements			
Code	**Title**	**Credits**	**Description**

CSCI598	Project	3	The aim of the course is for the student to develop in-depth knowledge and skills regarding development work within the main area of computer science. This course consists of doing an individual investigation into a topic of interest in a basic or applied computer science area with the goal of producing original results. This course requires independent development, and documentation of substantial software, or computer-based system, employing recent or significant technologies and/or tools.
CSCI599	Scientific Research	3	The aim of the course is for the student to develop in-depth scientific knowledge and skills regarding research and development work within the main area of computer science. This course consists of doing an individual investigation into a topic of interest in a basic or applied computer science area with the goal of producing original results.
Major Elective Courses			
Code	**Title**	**Credits**	**Description**
CSCI615 (Set A)	Data Mining and Data Warehouse	3	This course covers two very important branches of database technology: data warehousing and data mining. Students will distinguish data warehouses from transactional databases. Students will also learn data mining techniques to discover new information in terms of patterns or rules from vast amounts of data. The course is also a semester-long project with various hands-on exercises that provide practical experience in implementing and testing a data mining technique.
CSCI621 (Set A)	Wireless Networks	3	This course requires good knowledge in Networks. It helps to understand the current Wireless systems such as GSM, UMTS, LTE, and Wi–Fi that offer possibilities to keep people connected while on the move. In this flood of technology, GSM to LTE: An Introduction to Mobile Networks and Mobile Broadband enables students to examine and understand each technology, and how to utilize several different systems for the best results. This course contains not only a technical description of the different wireless systems available today but also explains the rationale behind the different mechanisms and implementations. Thus, the advantages and also limitations of each technology become apparent. In general, this course offers a solid introduction to major global wireless standards in addition to the comparisons of different wireless technologies and their applications. It covers aspects such as Cellular concept and Planning, Mobility and Security Management, Air Interface, and Radio Network.
CSCI626 (Set A)	Applied Cryptography	3	This course introduces foundational concepts and practical aspects of cryptography. Students will explore symmetric and asymmetric cryptography, cryptographic hash functions, digital signatures, and protocols securing communication systems. The course emphasizes understanding and applying cryptographic algorithms with real-world relevance, guided by the latest developments including post-quantum cryptography.
CSCI635 (Set A)	Blockchain technology	3	This course introduces the fundamental concepts and technologies behind blockchain systems, focusing on decentralized architectures, cryptographic foundations, and transaction processing. Students study the structure and purpose of blockchains, including wallets, public and private keys, transactions, blocks, block headers, and block propagation. The course examines the Bitcoin blockchain in detail, covering the UTXO transaction model, digital signatures, mining, validators, and consensus mechanisms such as Proof of Work and Proof of Stake. Core blockchain data structures, including Merkle Trees and node types (light and full nodes), are analyzed through lectures and practical exercises
CSCI638 (Set A)	Introduction to Autonomous Systems	3	This course introduces the basic concepts of autonomous systems, focusing on both ground and aerial vehicles (like drones). Students will learn about system components, sensing, navigation, control, and decision-making. Using simulation tools, they will gain practical experience programming and testing autonomous behavior