COMPUTER SCIENCE (CSCI)

CSCI 5304 Database Systems
Credits: 3 (3-0-0)
This course will cover issues like database design, database programming techniques, specialized database models, file and database organization techniques, query processing and optimization, and database security. It will also explore emerging database models like NoSQL databases and Big data. .

Prerequisites: A grade of "B" or better in each of: CSCI 1437, and CSCI 2436 or equivalent of each of these courses as determined by the program graduate coordinator.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5306 Computer Networks
Credits: 3 (3-0-0)
This course provides exposure to advanced topics in computer networks including recent research findings in this field. The topics include: internetworking, Internet concept, Client-server model for applications, Network and internet management. Also, this course covers recently emerging protocols and technologies such as: Virtualization and Software Defined Networks (SDNs), IPv6, wireless networks, Secure Socket Layer, and Transport Layer Security. More advanced topics to be determined by the instructor.

Prerequisites: A grade of "B" or better in each of: MATH 2314, CSCI 1437, and CSCI 2436 or equivalent of each of these courses as determined by the program graduate coordinator.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5311 Software Project Management
Credits: 3 (3-0-0)
This course will examine methods to manage software projects and introduce several software management processes. Major subjects will include: principles of effort estimation, human resource management, risk management and resource allocation. Other subjects will include: essential techniques to develop software project management activities and managing the quality of the developed software.

Prerequisites: A grade of B or better in each of: CSCI 1437, CSCI 2436 or equivalent as determined by the program graduate coordinator.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5313 Artificial Intelligence
Credits: 3 (3-0-0)
This course examines the concepts, principles, and application of artificial intelligence in various contexts of problem-solving and learning, knowledge-based representation and reasoning, and natural language processing. This course provides fundamental knowledge on artificial intelligence and its application methodologies.

Prerequisites: A grade of "B" or better in each of: CSCI 1437, CSCI 2436 or equivalent as determined by the program graduate coordinator

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5315 Big Data Analytics
Credits: 3 (3-0-0)
This course will introduce students to the concepts, principles, and applications of big data and big data analytics. It will provide knowledge and practical experience on big data analytics tools and platforms such as MongoDB, MapReduce, Hadoop, and Spark which leverage big data to solve current business problems.

Prerequisites: A grade of "B" or better in each of: MATH 2314, CSCI 1437, CSCI 2436 or equivalent as determined by the program graduate coordinator.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5316 Software Engineering
Credits: 3 (3-0-0)
This course will cover subjects in software engineering that include but not limited to: emerging software development methodologies, software models, design patterns, etc. The course will include the development of software engineering projects and the evaluation of the different activities that occur through the life cycle of a typical software engineering project.

Prerequisites: A grade of "B" or better in each of: MATH 2314, CSCI 1437, and CSCI 2436 or equivalents as determined by the program graduate coordinator.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5320 Decision Support Systems
Credits: 3 (3-0-0)
This course will study applications and information systems to support decision making by individuals or groups. Examples of such systems include, but not limited to: knowledge-based systems, neural networks, expert systems, electronic meeting systems, group systems and web-based systems. The course discusses problem solving and decision making in which computers can be used as tools to gain the insight needed to support selection of decision alternatives.

Prerequisites: A grade of "B" or better in each of: MATH 2314, CSCI 1437, CSCI 2436 or equivalents as determined by the program graduate coordinator.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5321 Info Assurance/Risk Management
Credits: 3 (3-0-0)
This course examines risk management in complex information systems using formal security risk analysis and risk mitigation methods. The course introduces students to the federal government certification and accreditation process and how that is integrated with private industry partners. Students will develop skills in security compliance and risk assessment.

Prerequisites: A grade of "B" or better in each of: MATH 2314, CSCI 2325 or equivalents as determined by the program graduate coordinator.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5323 Cryptography/Secure Comm
Credits: 3 (3-0-0)
The course will introduce different approaches to the design and implementation of secure information systems and communication channels through the usage of encryption and integrity verification techniques. Topics include, but are not limited to mathematical models and applications of symmetric and asymmetric encryption methods, quantum encryption, etc. Course also includes methods and experiments to test and evaluate the different encryption algorithms.

Prerequisites: A grade of "B" or better in each of: MATH 2314, CSCI 1437, CSCI 2436 or equivalents as determined by the program graduate coordinator.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5325 Mobile App Development I
Credits: 3 (3-0-0)
This course covers the mobile application development frameworks; architecture, design and engineering issues, techniques, methodologies for mobile application development targeted for mobile devices running such as the Android operating system.

Prerequisites: A grade of "B" or better in each of: CSCI 1437, CSCI 2436 or equivalents as determined by the program graduate coordinator.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5326 Security in Emerging Tech
Credits: 3 (3-0-0)
This course investigates the state-of-art of security and associated risks, threats, and defense mechanisms in current emerging technologies including cloud computing, Internet of Things, and software-defined networks. Other topics include: knowledge on security concepts and intelligent security techniques, and application of security controls for solving security issues in new technological domains.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5327 Information Security
Credits: 3 (3-0-0)
This course provides a comprehensive view of information security and provides exposure to some advanced topics in information security and assurance. Topics include: advanced authentication, intrusion detection, digital forensics, collecting evidence and data retrieval techniques, cyber physical systems security, and cloud security. This course also explores the growing challenges of securing sensitive data, networks, mobile devices and applications with different privacy controls to defend against malicious acts. Additionally, the course addresses new trends in how machine learning and anti-malware defenses can respond to threats, and protect networks, infrastructure and users.

Prerequisites: A grade of "B" or better in each of: MATH 2314, CSCI 1437, CSCI 2436 or equivalents as determined by the program graduate coordinator.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5331 Enterprise Resource Plan Sys
Credits: 3 (3-0-0)
This course exposes students to complex issues with enterprise resource planning (ERP) system development and operation. Students explore ERP technology and life cycle planning, business process redesign, process mapping, and risk management and security in ERP systems. Students will develop skills in an ERP system such as SAP.

Prerequisites: A grade of "B" or better in each of: MATH 2314, CSCI 1437, 2436 or equivalents as determined by the program graduate coordinator.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5332 Bus Intel/ Data Mining
Credits: 3 (3-0-0)
This course provides an integrative foundation in the field of business intelligence and data mining. It focuses business data warehousing multidimensional data modeling, online analytic processing, business reporting and planning, data mining, along with other advanced topics relevant to the field of business intelligence.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5337 Applications Programming
Credits: 3 (3-0-0)
The course covers intermediate to high level programming topics. The course uses intensive hands-on programming exercises and assignments. Programming topics may include (but not limited to) applications in: cyber security, networks, parallel/multi-threading, system programming, data analytics, machine learning. Programming language determined by instructor. Students with conditional admission will be required to complete CSCI 5337 at A&M-SA in the first semester of admission and get a grade of "B" or better, in order to be permitted to continue in the program.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5341 Machine Learning and Deep Learning
Credits: 3 (3-0-0)
This course examines the concepts, principles, and application of machine learning (ML) and deep learning (DL) by providing fundamental knowledge of ML/DL and hands-on experiences to develop ML/DL models in real-world scenarios. After taking this course, students will not only be able to apply the state-of-the-art ML/DL algorithms in their own projects but also be able to develop their own ML/DL algorithms. The topics of this course include supervised learning, weakly supervised learning, self-supervised learning, classification, regression, and detection.
This course will introduce a wide range of ML/DL algorithms, such as Linear Regression, Logistic Regression, Deep Neural Networks (MLP), Convolutional Neural Network (CNN), Recurrent Neural Network (RNN), Transformers, and Vision Transformers (ViT).

Prerequisites: A grade of B or better in each CSCI 2436 and MATH 2314 or equivalent, or by the program coordinator's approval.

Restrictions: Undergraduate level students may not enroll.Enrollment limited to students in the Computational, Engr, Math Sc department.

CSCI 5343 Algorithms
Credits: 3 (3-0-0)
This course examines the range of algorithms for various computational problems, recognizing their strengths and weaknesses, and their suitability in particular contexts. Algorithm design techniques with time and space efficiency are a pervasive theme throughout this course. Course will cover sorting, manipulation of data structures, graphs, matrix multiplication, and pattern matching.

Prerequisites: A grade of "B" or better in each of: MATH 2314, CSCI 1437, CSCI 2325, and CSCI 2436 or equivalents of each of these courses as determined by the program graduate coordinator.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5345 Mobile App Development II
Credits: 3 (3-0-0)
This course covers the mobile application development frameworks; architecture, design and engineering issues, techniques, methodologies for mobile application development targeted for mobile devices running iOS operating system.

Prerequisites: A grade of "B" or better in each of: CSCI 1437, CSCI 2436 or equivalents as determined by the program graduate coordinator.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5353 Secure Software Development
Credits: 3 (3-0-0)
This course examines the methods to design and implement the secure software. Topics include the secure software development process, threat modeling, security code reviews, and formal specification, testing, and verification.

Prerequisites: A grade of "B" or better in each of: CSCI 1437, CSCI 2436 or equivalents as determined by the program graduate coordinator.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5362 Operating Systems
Credits: 3 (3-0-0)
This course covers advanced topics in Operating systems. Course will cover subjects from the different OS environments: Windows, Linux, MAC, mobile and web operating systems. Course will also focus on the assessment and evaluation of operating systems security. Course will be conducted using a research-based approach and students will work on current research trends in operating systems.

Prerequisites: A grade of "B" or better in each of: MATH 2314, CSCI 1437, CSCI 2325, and CSCI 2436 or equivalents as determined by the program graduate coordinator.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5366 Software Quality Assurance
Credits: 3 (3-0-0)
This course will introduce software quality assurance and software testing. The course will cover different techniques and algorithms of software testing which include unit, integration, system and interface testing techniques. Course will cover black-box and white-box testing, software testing throughout the software process, and software quality metrics and quality assurance.

Prerequisites: A grade of "B" or better in each of: CSCI 1437, CSCI 2436 or equivalents as determined by the program graduate coordinator.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5372 Cloud Computing
Credits: 3 (3-0-0)
This course educates the students about building cloud infrastructure based on a cloud computing reference model. The reference model includes five fundamental layers (physical, virtual, control, orchestration, and service) and three cross-layer functions (business continuity, security, and service management) for building a cloud infrastructure. For each layer and cross-layer function, this course covers the comprising technologies, components, processes, and mechanisms. This course takes an open-approach to describe the concepts and technologies. The course follows the U.S. National Institute of Standards and Technology as a guide for all definitions of cloud computing.

Prerequisites: A grade of "B" or better in each of: CSCI 1437, CSCI 2436 or equivalents as determined by the program graduate coordinator.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5391 Graduate Seminar
Credits: 3 (3-0-0)
This course will provide a broad range of current research topics in computer science and related fields to non-thesis track students to complete a major project and presentation to demonstrate the knowledge and skills. Non-thesis track graduate students in the MSCS program must register this course at the last semester of their graduate studies. This course is specifically designed for non-thesis track graduate students in the MSCS program.

Prerequisites: CCS department program graduate coordinator approval.

Restrictions: Enrollment is limited to Graduate level students.

CSCI 5393 Topics in Computer Science
Credits: 3 (3-0-0)
This course will introduce one or more advanced topics in an area of computer science. May be repeated when topic changes.

Prerequisites: CCS department program graduate coordinator approval.

Restrictions: Enrollment is limited to Graduate level students.
Repeat Status: Course may be repeated 2 time(s).

CSCI 5395 Thesis
Credits: 3 (0-0-3)
This course will provide an experience of undertaking and completing a piece of research, applying techniques learned throughout the program Thesis track students in MSCS program will complete a thesis and present to demonstrate the research accomplishment . Thesis track graduate students in the MSCS program must register this course at the last two semesters of their graduate studies.

Prerequisites: CCS department program graduate coordinator approval.

Corequisites: ACCT 5035.

Restrictions: Enrollment is limited to Graduate level students.
Repeat Status: Course may be repeated 5 time(s).