COMPUTER SCIENCE (CSCI)

CSCI 5101. Foundations of Information Sys (3)
This course covers the fields of enterprise security and privacy. The course deals with the identification of threats to enterprise information technology (IT) systems, access control and open systems, and system and product evaluation criteria. In addition, it discusses the enterprise security requirements. Risk management and policy considerations are examined with respect to the technical nature of enterprise security as represented by government guidance and regulations to support information confidentiality, integrity and availability. The course also deals with the fundamental hacking approaches through practical exposure via hands-on assignments, discussions, and quizzes. For lab assignments, students are expected to use various tools to complete the deliverable(s).

CSCI 5112. System Analysis & Design (3)
This course will introduce the concepts and techniques for analyzing and designing business information systems. Topics include the system analysis, the systems development life cycle, system development methodologies, development technology, systems implementation, and systems support. Tools and techniques for systems analysis and systems design are also introduced.

CSCI 5201. Database Theory and Design (3)
This course presents terminology, basic concepts, and applications of database processing. The course emphasizes database design using various modeling techniques; database implementation using the relational model, normalization, and SQL.

CSCI 5306. Computer & Networks Security (3)
This course covers the design and implementation of protocols and the vulnerabilities and risk associated with these implementations. Other topics include Cryptographic techniques and algorithms. Design and implementation of network routing protocols and security architecture will be done using software simulation tools. Departmental Approval or Consent of Instructor

CSCI 5317. Operating Systems Admin& Secur (3)
This course covers computer operating systems, such as UNIX and Linux, systems programming,systems administration, and operating systems hardening.

CSCI 5501. Secure Network Modeling &Simul (3)
This graduate-level course will examine modern techniques for secure network planning, analyzing with modeling the structure and dynamics of secure complex networks. Topics include gathering, interpreting, and evaluating customer requirements; defining the scope of work and analyzing resource and technology constraints and system inter-dependencies; analyzing facilities bandwidth requirements and capacity planning; researching product and vendor architecture and equipment specifications and limitations; finally, preparing an overall integration plan for new processes, protocols and equipment. A graduate level software project will be completed by each student.
Prerequisites: CSCI 5306 and CSCI 5317

CSCI 5502. Secure Networks & Communicatio (3)
This graduate course will include topics on hardware and software diagnostic tools and utilities, LANs MANs, WANs and the Internet, OSI protocol stack, flow control, switching, data compression, application program-network interface, and security issues. Also included are basic electronic topics such as electrical measurements, DC and AC circuits, diodes, transistors and OP amps, digital electronics, and microprocessors. A graduate level software project will be completed by each student.
Prerequisites: CSCI 5306 and CSCI 5317

CSCI 5601. Software Security (3)
This course will provide students with knowledge of software security risks and policies management, software security theories, secure software design and testing, secure coding, and software security standards. Students will be exposed to the techniques and tools needed for the practice of effective software security to understand how to protect software and how to secure software.

CSCI 5701. Introduction to Cybersecurity (3)
This course will address network and web-based security issues in general: network intruders (hackers), security policies and procedures, firewall, encryption, authentication and access control, and viruses. In addition, security issues applied to various LAN and WAN environments, are covered. Some e-commerce security topics, such as, electronic payments, secure transactions, secure sockets layer, digital signatures, and auditing, are also covered.

CSCI 5810. Data Mgmt & Bus. Intelligence (3)
The course provides students with an understanding of database technology and its application in managing data resources and business intelligence. The database design and data retrieval will be introduced. The fundamental concepts of business intelligence, such as classification, clustering, association analysis, and anomaly/novelty detection, will be covered with their applications to the real-world problems. A database management system will be used to illustrate these concepts and applications.
Prerequisites: BUSA 5200 or ITFN 4154 (may be taken concurrently) or ARST 5100 (may be taken concurrently)

CSCI 5811. Data Anal. & Visual. for Bus. (3)
The course covers data analytics to ensure that the visualizations add to the effective interpretation and explanation of the underlying linked business data. Effective visualization and design are illustrated with a variety of tools to enable effective detection of trends and patterns that can be easily connected to real world events to help explain relationships and interrelationships.
Prerequisites: CSCI 5810

CSCI 6010. Digital Forensics and Incident (3)
This course covers concepts and techniques in the field of computer and cyber forensics, which includes investigating, acquiring, preserving and analyzing digitally stored information. Students will practice performing digital forensics investigations using industry-standard forensic tools, techniques and procedures in the digital forensic process. Students will analyze various effective plans for crisis management and incident-handling process, including methods and standards for extraction and preservation of legal evidence, uncovering illicit activities, recovering information left on digital storages and extracting files from intentionally damaged media.
Prerequisites: CSCI 5306 and CSCI 5317

CSCI 6012. Information Risk Management (3)
This course will provide students with a good understanding of identifying, assessing, analyzing, measuring, and responding to information risk. Students will be able to make risk mitigation and acceptance decisions given its resource constraints. Students will be able to use risk management tools, regulations, and methodologies for metrics to monitor risk management activities.
Prerequisites: CSCI 5701 or CSCI 5101

CSCI 6092. Adv. Topics in Cyber Tech. (3)
The current and latest topics in Cyber Technology research will be presented. Students will review the articles, journals, white papers using Internet, computerized databases and library resources.
Prerequisites: (CSCI 5306) or (CSCI 5317) or (CSCI 5601) or (CSCI 5701)

CSCI 6093. Advanced Topics in Informatio (3)
Selected advanced topics of current interest in information systems will be presented in this course. Students will review the articles, journals, white papers, and use computerized databases and library resources. This course will be offered as fits the needs and interests of the student and faculty.

CSCI 6134. Enterprise Security Management (3)
This course covers threat assessment, risk management, and protection of networks, hardware, and data for enterprise level systems.
Prerequisites: CSCI 5701

CSCI 6201. Data Management for Analytics (3)
Covers the theory and applications of data management to support data analytics, including data models, security, examination, transformation, and exploration. Discusses the fundamental concepts and emerging technologies include relational databases, NoSQL databases, data integration, and data processing for analytics.
Prerequisites: (CSCI 5101) and (CSCI 5201)

CSCI 6202. Data Mining and Data Warehousi (3)
This course introduces students to algorithms and skills for data mining and overall architecture of data warehousing. Topics include data cube technology, pattern recognition, advanced classification and clustering analysis, outlier detection, data visualization, data integration, and data warehousing. Data mining and data warehousing applications will also be discussed.
Prerequisites: CSCI 6201

CSCI 6208. Disaster Recovery Planning (3)
This course explores the plans and preparations needed to recover from disasters affecting enterprise information systems and critical infrastructures with the goal of maintaining business continuity. Emphasis is given to the technological aspect of the planning for recovery and business continuity planning. Topics include disaster recovery planning, risk control policies and countermeasures, disaster recovery tools and services, and virtualization principles.
Prerequisites: CSCI 5701

CSCI 6306. Cryptographic Techniques (3)
This course introduces the tools and techniques used in modern cryptography. Topics include secret and public key ciphers, one-way hashing algorithms, authentication and identification, digital signatures, key establishment and management, steganography, secret sharing and data recovery, public key infrastructures, and efficient implementation. Privacy and security at the upper layers are also discussed.
Prerequisites: CSCI 5701

CSCI 6307. Foundation of Artificial Intel (3)
This course is an introduction to artificial intelligence and deep learning. Topics include (1) traditional intelligent system design methodologies, search and problem solving, supervised and reinforced learning, and (2) the technologies, methodologies, and tools for deep learning such as neural networks and optimization algorithms.
Prerequisites: CSCI 5201

CSCI 6308. Cloud Computing (3)
This course introduces students to the Cloud concepts and capabilities across the various Cloud service models including Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), and Business Process as a Service (BPaaS). It covers a broad range of Cloud vendor platforms including AWS, Google App Engine, Microsoft Azure, Eucalyptus, OpenStack and others. The topics include both concepts on parallel and distributed computing platforms and programming skills required for harvesting computational powers.
Prerequisites: CSCI 5317

CSCI 6310. Data Security and Analytics (3)
This course will provide students with a good understanding of data security laws and standards, risk management of data security, data security models, data security and auditing, data encryption. We will also cover various artificial intelligence analysis and risk assessment techniques applied to data security. The AI-based solutions will be discussed to support data threats and risk assessments and detection.
Prerequisites: CSCI 5701

CSCI 6433. Web Application Development (3)
This course will introduce students to the concepts and fundamental practices necessary to create interactive web-based applications. Application design and development are covered including control mechanisms, models, and views design and development. Students will learn both server size and client site fundamental scripting will be introduced along with customized databases for team projects.
Prerequisites: (CSCI 5201) and (CSCI 5112)

CSCI 6443. Digital Transformation (3)
This course provides students with insights on key aspects of Digitalization and Business Transformation. Students will understand the disruptive nature of Digitalization and consequences for Business Strategies and Business Transformation across all industries. Students will receive a short introduction on the development of Information Systems over the last 25 years and today's most important technologies and technology providers. Furthermore, students will gain an understanding of key technologies like Cloud Computing, Internet of Things, Big Data Analysis, and Artificial Intelligence.
Prerequisites: CSCI 5101

CSCI 6574. Research Techniques (3)
Students will learn how to conduct literature reviews of articles, journals, white papers using Internet, computerized databases and library resources. Students will learn to develop research questions, hypotheses, research topics, research designs and write research papers in standard format.
Prerequisites: CSCI 5701 or CSCI 5601 or CSCI 5317 or CSCI 5306 or CSCI 5101 or CSCI 5112

CSCI 6598. Special Project (3)
Continuation of research on MSDS Special Project. Satisfactory oral defense of topic is required for graduation.
Prerequisites: CSCI 6574

CSCI 6599. Special Project (3)
Continuation of research on MSCT Special Project. Satisfactory oral defense of topic is required for graduation.
Prerequisites: CSCI 6574

CSCI 6600. Thesis (3)
Continuation of research on MSCT thesis. Satisfactory oral defense of topic is required for graduation.
Prerequisites: CSCI 6574

CSCI 6601. Thesis (3)
Continuation of research on MSDS thesis. Satisfactory oral defense of topic is required for graduation.
Prerequisites: CSCI 6574

CSCI 6602. Thesis (3)
Continuation of research on thesis. Satisfactory oral defense of topic is required for graduation. Prerequisite(s): CSCI 6574 and Core courses and two courses in the area of emphasis.
Prerequisites: CSCI 6574

CSCI 6701. Introduction to Health Informa (3)
This course will present the knowledge, infrastructure, functions, and tools of health informatics. The course provides an overview of the theory, processes, and applications of information systems to healthcare, policy, and management. It also provides a basic understanding of data standards and requirements, critical concepts and practices in mapping and interpreting health information. It explores technology in planning, management, and applications in healthcare. Topics also include core concepts and issues in planning, implementing, and evaluating health information systems.

CSCI 6705. Found. Clinic. Proc. and Work. (3)
This course provides an understanding of applications of information systems in healthcare processes and workflows. Students will become familiar with fundamentals of medical terms, coding systems, electronic health records, processes, process analysis and redesign in the healthcare settings. The course also introduces clinical workflows and process evaluation, re-engineering with advanced information management tools and techniques, and case studies.

CSCI 6710. Health Care Analytics and Appl (3)
This course is designed to provide students with an understanding of healthcare data models that could help improve administrative costs, decision making, patient care and patient wellness. Fundamentals of data sciences based upon statistical and biological models will be discussed. Applications to environmental health and other relevant healthcare fields will be considered.
Prerequisites: CSCI 5201

CSCI 6812. Data Science (3)
This course will introduce students to data science and skills used in data science. It includes concepts from Statistics, Computer Science and Software Engineering. Students will learn theory and skills of data management, data storage, data processing and analysis, data visualization, and data application. Data science programming languages such as Python and their associated data analysis libraries will be learned through hands-on practices. In addition, students will learn skills of developing data products via programming, research, and communicating results.
Prerequisites: CSCI 5201

CSCI 6820. Knowledge Engineering (3)
This course covers knowledge engineering and its applications. The topics cover designs, develops and integrations of information systems and technologies to construct knowledge. Students will learn about fundamental knowledge representation and reasoning, knowledge modeling, knowledge acquisition, and evolution.
Prerequisites: CSCI 6812

CSCI 6901. Directed Study (3)
Directed study and research on current CSIT topics.