LSUS | Department of Computer Science

Master of Science in Computer Systems Technology

Course Descriptions

CSC 620: Programming Language Concepts – 3 cr.
Prerequisite: Consent of the department. A study of formal languages and grammars as defined by the Chomsky hierarchy, formal methods for defining the syntax and semantics of programming languages, and the fundamental features and concepts of programming languages from multiple language paradigms. Three hours of lecture in a computer lab setting.

CSC 625: Database Implementation - 3 cr.
Prerequisite: Consent of the department. Study of the advanced topics of database management systems such as benchmarking, transaction processing, file and index implementation, concurrency control, recovery, query optimization, and stored procedures. Includes a project. Three hours of lecture.

CSC 630: Computer Networks - 3 cr.
Prerequisite: Consent of the department. The fundamentals of data communications and computer networking. Topics include data encoding and transmission, as well as network architecture and protocol. The OSI model is used as the basis of study. Three hours of lecture.

CSC 635: Programming with Internet Technologies - 3 cr.
Prerequisite: Consent of the department. An introduction to developing applications using Internet technologies such as XHTML, Cascading Style Sheets, Javascript, DHTML, XML, web server, web databases and server-side scripting. Three hours of lecture.

CSC 638: Network and Computer Security - 3 cr.
Prerequisite: Consent of the department. Issues of computer system and network security. This will include common security threats and the countermeasures and protocols used to combat them. Topics include encryption, user and message authentication, access control, viruses, worms, certificates, firewalls, as well as security policies, practices, standards and professional certifications.

CSC 642: Operating Systems - 3 cr.
Prerequisite: Consent of the department. A general study of the principles and architecture of operating systems, as well as methods for their implementation. Topics include concurrent processes, resource management, parallel processing, security, and performance. Three hours of lecture.

CSC 650: Computer Graphics - 3 cr.
Prerequisite: Consent of the department. Techniques for representation, transformation, and display of patterns and images on\ graphics display devices. Three hours of lecture.

CSC 660: Rapid Applications Development - 3 cr.
Prerequisite: Consent of the department. A study of tools and techniques used in the rapid development of applications that run in current operating system environments. The object-oriented and visual programming paradigms will be emphasized. Three hours of lecture.

CSC 664: Information Visualizations - 3 cr.
Prerequisite: Consent of the department. An in-depth examination of computer-based strategies for interactive visual presentation of information to explore, discover, and learn from large data sets. Study of classic and advanced computer visualization principles, techniques, and tools used for explaining and understanding symbolic, structured, and/or hierarchical information. Projects will apply design principles, interaction strategies, information types, and experimental results. Three hours of lecture.

CSC 666: Introduction to Bioinformatics - 3 cr.
Prerequisite: Consent of the department. Introduces principles, concepts, methods, techniques, algorithms, tools, and strategies to transform and process the masses of information from biological experiments. Focusing computational methods to analyze genome and protein sequences to derive structural and functional information. Student teams conceive, design, specify, implement, evaluate, and report on a software project in the domain of biomedicine. Three hours of lecture.

CSC 667: Introduction to Machine Learning - 3 cr.
Prerequisite: CSC 120 and MATH 121 or consent of the department. Knowledge of python and statistics desirable. Computer programs that can automatically improve performance through experience. Linear Models of classification and regression; supervised and unsupervised learning; kernel methods; sequential methods; neural networks and introduction to deep learning. Recent applications in speech recognition and computer vision. Three hours of lecture in a classroom/computer lab setting.

CSC 668: Introduction to Data Mining - 3 cr.
Prerequisite: Consent of the department. Introduction to the fundamental and advanced concepts of data mining and knowledge discovery. Learn to analyze, design, develop and evaluate techniques and tools. Topics include data preprocessing, data characterization and comparison, decision trees, association rule mining (also in large databases), classification and prediction, clustering and cluster analysis and statistical modeling. Three hours of lecture.

CSC 669: Deep Learning - 3 cr.
Prerequisite: CSC 467/667 or consent of the department. Python required. Artificial neural networks with multiple layers and richer feature learning. Convolutional Neural Network; Recurrent Neural Network; Long Short-Term Memory; Auto-encoder; Generative Adversarial

Network; and Representative Learning. Application and recent advances. Three hours of lecture in a classroom/computer lab setting.

CSC 680: Software Engineering Concepts - 3 cr.
Prerequisite: Consent of the department. Survey of concepts and techniques of software development. A team approach to all phases of the software life cycle: analysis, design, coding, testing, and documentation. Three hours of lecture.

CSC 681: Software Engineering Project - 3 cr.
Prerequisite: Consent of the department. The implementation of a significant software system. A team approach to all steps: analysis, design, coding, testing, and thorough documentation. Three hours of lecture.

CSC 690: Selected Topics - 3 cr.
Prerequisite: Consent of the department. May be repeated for credit for a maximum of six term hours. Topics to be announced by the department. Three hours of lecture.

CSC 695: Independent Study - 3 cr.
Prerequisite: Consent of the department. May be repeated for a maximum of six term hours. Readings, conferences, and reports under the guidance of a member of the Computer Science faculty. Three hours of research.

COMPUTER SYSTEMS TECHNOLOGY

CST 701: Computer System Organization - 3 cr.
Prerequisite: Ability to program in high-level programming language. Survey of the components of modern computing systems, including hardware components, operating systems and system software, program development environments and common applications software. Three hours of lecture.

CST 703: Data Models - 3 cr.
Prerequisite: CST 701. Structures and algorithms used for the storage and maintenance of data. Organization, representation and manipulation methods used in file systems, databases, and database systems. Three hours of lecture.

CST 707: Data Modeling and Database Design - 3 cr.
Prerequisites: CST 703. The design of a database is examined from identification of data and construction of the logical model which describes how the data are employed, to the mapping of the data model onto the architecture of the DBMS and the subsequent performance evaluation and tuning. Three hours of lecture.

CST 711: Informatics - 3 cr.
Prerequisite: CST 703 or consent of the department. Informatics is the science of the use and processing of data, information, and knowledge. This course covers a variety of applied issues from information technology, information management at a variety of levels, ranging from simple data entry, to the creation, design and implementation of new information systems, to the development of models. Topics include basic information representation, processing searching,

and organization, evaluation and analysis of information Internet-based information access tools, ethics and economics of information sharing. Three hours of lecture.

CST 790: Selected Topics in Computer Systems Technology - 3 cr.
Prerequisite: Consent of the College of Sciences. May be repeated for a maximum of six term hours. Selected topics will vary from term to term. Three hours of lecture

CST 796: Business Systems Project - 3 cr.
Prerequisite: Consent of the department. An implementation project that makes use of computing knowledge and skills to solve a problem from business. Final grading is on a pass/no credit basis.

CST 797: Biomedical Informatics Project - 3 cr.
Prerequisite: Consent of the department. An implementation project that makes use of knowledge of computing and biomedical informatics to solve a problem from the field of biomedicine. Final grading is on a pass/no credit basis.

CST 798: Computer Science Project - 3 cr.
Prerequisite: Consent of the department. An implementation project that makes use of knowledge of computing and computer science to implement a significant software system. May be repeated for a maximum credit of six term hours. Final grading is on a pass/no credit basis.

CST 799: Thesis 1-6 cr.
Prerequisite: Consent of the department. A significant research project in the field of biomedical informatics. Final grading is on a pass/no credit basis. One to six credit hours per term.