ACS-APPLIED COMPUTER SCIENCE

ACS 5113 Programming Principles 3 Credit Hours
Prerequisite: Graduate Standing. This course introduces the fundamental concepts of structured and object-oriented programming and provides a comprehensive introduction to programming for computer science and technology majors. Topics include software development methodology, data types, control structures, functions, arrays, classes, methods, object-oriented programming concepts, sorting and searching, and the mechanics of running, testing, and debugging. (F, Sp, Su)

ACS 5123 Mathematics for Computer Science 3 Credit Hours
Prerequisite: Graduate Standing. This course covers widely applicable mathematical tools for computer science, including topics from logic, set theory, combinatorics, linear algebra, number theory, probability theory, and graph theory. It includes practice in reasoning formally and proving theorems. (F, Sp, Su)

ACS 5133 Introduction to Programming in Python 3 Credit Hours
Prerequisite: Graduate standing. This course is an introduction to programming designed to serve as a first course in programming to build the foundation required to pursue advanced courses in programming, data structures, data science, machine learning, and AI. It requires no prior programming experience. It offers hands-on experience of solving computational problems using algorithms, object-oriented programming and related concepts. (F, Sp)

ACS 5213 Practical Data Structures and Algorithms 3 Credit Hours
Prerequisite: Graduate Standing; ACS 5113, ACS 5123. This course covers fundamental concepts and the application of data structures and algorithms. Topics include abstract data types, dynamic arrays, iterators, linked lists, generics, stacks, queues, binary search trees, collections, hashing, graphs, and sorting. (F, Sp, Su)

ACS 5223 Introduction to Software Engineering 3 Credit Hours
Prerequisite: Graduate Standing; ACS 5113, ACS 5213. This course is a team project course focused on the practical application of common, modern techniques to all aspects of software project development. Students will learn about effective processes for software requirements specification, planning, design, documentation, development, review, defect tracking, testing, product delivery, and product evaluation. There is some emphasis on resource tracking and software quality. (F, Sp, Su)

ACS 5313 Applied Database System Technologies 3 Credit Hours
Prerequisite: Graduate Standing; ACS 5213, ACS 5223. This course concentrates on the concepts and structures necessary to design, implement, and use a database system. It is oriented towards the general principles, their applications, and the relevant theoretical foundation. This course will give you skills to design, develop, manage, and administer cutting-edge database systems. You will learn about relational database systems with SQL and databases. (F, Sp, Su)

ACS 5323 Data Security, Networks and Network Security 3 Credit Hours
Prerequisite: Graduate Standing; ACS 5113, ACS 5213. This course will begin by introducing Data Security and Information Security. Discussions about Risk Management, its principles, methods, and types will be included in the course. This course will explain the different ways of securing and protecting data on both hardware and software platforms. Network Security will cover various security issues and vulnerabilities in various network layers. (F, Sp, Su)

ACS 5413 Mobile Devices Software Development 3 Credit Hours
Prerequisite: Graduate Standing; ACS 5223, ACS 5313. This course introduces the concepts, practices, and technologies to design, develop, and manage cross-platform websites and applications running on modern mobile devices. The students will gain plenty of experience from hands-on exercises. The course also provides a higher-level survey of technologies, principles, strategies, and frameworks for mobile device software development. The class will focus on UI design and programming. (F, Sp, Su)

ACS 5423 Software Development for World Wide Web 3 Credit Hours
Prerequisite: Graduate standing and ACS 5223. This course will introduce concepts in programming web application servers. At the conclusion of this course, you will understand the fundamental concepts of software engineering as it is applied to web application design and programming, know the modern tools used to program web application servers, and be able to produce substantial web applications as part of a team. (F, Sp, Su)

ACS 5513 Applied Machine Learning 3 Credit Hours
Prerequisite: Graduate Standing and ACS 5213. Machine learning is the data-driven process of constructing mathematical models that can be predictive of data observed in the future. In this course, we will study the use of a range of supervised, semi-supervised and unsupervised methods to solve both classification and regression problems. (F, Sp, Su)

ACS 5523 Introduction to Cloud Computing 3 Credit Hours
Prerequisite: Graduate Standing and ACS 5213. This course gives students an overview of the field of Cloud Computing, its enabling technologies, main building blocks, and hands-on experience through projects utilizing public cloud infrastructures. Cloud computing services are being adopted widely across a variety of organizations and in many domains. (F, Sp, Su)

ACS 5533 Advanced Applied Machine Learning 3 Credit Hours
Prerequisite: graduate standing and ACS 5513 Machine Learning Practice, or permission of instructor. This course provides an in-depth, hands-on exploration of modern machine-learning architectures and their implementation within contemporary ML technology stacks. Building on foundational concepts from classical machine learning, students will study and design advanced neural architectures -- including convolutional, recurrent, transformer, and graph-based models -- while learning how to operationalize them using industry-standard ML platforms, frameworks, and MLOps practices. (Sp, Su)