

Professional Education 2021-2022 Course Offering

FALL 2021

COT 6930 Object-Oriented Software Design with Python

August 21st – September 17th

On-campus lecture days: Saturday/August 21st & September 4th

This course provides a comprehensive overview of the main aspects and concepts behind the object-oriented development process, using Python as a programming language. It also discusses foundational aspects of professional software development using Python, including separation of concerns, abstraction and encapsulation, designing for high performance, as well as contemporary techniques, methodologies and best practices for designing and testing large systems, and writing clean, reusable code in a Pythonic way.

CNT 5109 Sensor Networks and Smart Systems

September 18th – October 15th

On-campus lecture days: Saturday/ September 18th & October 2nd

Sensor networks and smart systems are rapidly emerging in many fields including healthcare, transportation, buildings, environment, agriculture, energy, and many more. A sensor network consists of a large number of sensor nodes that collect information and communicate to a processing facility that leads to intelligent decision-making. This course discusses sensor networks, smart systems, and their applications.

CAP 6635 Artificial Intelligence

October 16th – November 12th

On-campus lecture days: Saturday/ October 16th & October 30th

This course introduces core concepts, techniques, and applications of artificial intelligence (AI). Course subjects include intelligent agents, problem solving by search, search strategies, game playing, knowledge representation and reasoning, learning from examples, and deep learning. The class also discusses ethical and societal implications of the increasing use of AI.

COT 6405 Analysis of Algorithms

November 13th – December 15th

On-campus lecture days: Saturday/ November 13th & December 4th

This course provides the foundations of algorithm design and analysis. The class will start with a brief overview of theoretical running time analysis using asymptotic notations and strategies for solving recurrences. The class will continue with the study of several algorithmic techniques: divide-and-conquer, network flow, greedy, dynamic programming, linear programming, approximation algorithms, and NP-completeness.

SPRING 2022

CEN 6027 Software Maintenance and Evolution

January 8th – February 4th

On-campus lecture days: Saturday/ January 8th & January 22nd

Software engineering rarely involves “green field” development because most organizations have substantial legacy systems. The legacy systems represent significant assets containing valuable components that can be reused as the system evolves over time to meet changing requirements and new business challenges. This course covers fundamental aspects of software maintenance and evolution. Topics covered include software maintenance & evolution concepts and techniques, process models for system evolution, representative techniques and tools for reverse engineering, reengineering, software visualization, and software reuse. Software maintenance and evolution case studies will also be presented.

CAP 5768 Introduction to Data Science

February 5th – March 4th

On-campus lecture days: Saturday/ February 5th & February 19th

This course provides a comprehensive introduction to the tools and analysis workflows employed by data scientists that include data wrangling, visualization, exploration, and modeling. Specific topics include an overview of the field of data science and analytics, data visualization, exploratory data analysis, data transformation, parameter estimation, hypothesis testing, linear regression analysis, logistic regression classification, model selection, feature selection, dimensionality reduction, and clustering. The practical application of these techniques to real data, as well as the interpretation and presentation of analysis results will be emphasized throughout the course.

CEN 5086 Cloud Computing

March 12th – April 8th

On-campus lecture days: Saturday/ March 12th & March 26th

This course introduces key topics and technologies related to cloud computing. Design principles for building large cloud-based solutions for compute and data intensive problems. Basics of scalability, virtualization, Service Oriented Architectures (SOA), and service layers IaaS, PaaS and SaaS. Practical use of public cloud infrastructures such as Amazon EC2 and S3, Microsoft Azure.

CAP 6619 Deep Learning

April 9th – May 4th

On-campus lecture days: Saturday/ April 9th & April 23rd

This course teaches students basic concepts of deep learning with applications in computer science, engineering, business, and healthcare. The class covers major topics including machine learning basics, deep forward networks, convolutional neural networks (CNN), and recurrent neural networks (RNN). The class will also cover implementations and applications of different deep learning models.

SUMMER 2022

CDA 6316 Embedded System Design

May 14th – June 10th

On-campus lecture days: Saturday/ May 14th & May 28th

A software and hardware integration course, from design concepts to practical implementation covering both analog and digital signal conditioning and interface. The course projects include the design and interface of various sensors such as temperature, humidity, pressure, flow, accelerometers, compasses, Gyros, and GPS. On the output side, you explore with LED arrays, servos, step motors, solid-state relays, etc. This hands-on course is project-based, and each student builds his own. We will give you a starter kit including an MSP430 Launchpad platform and a collection of sensors. You are welcome to use you own micro, such as Raspberry Pi or higher end.

COT 6930 Internet of Things

June 11th – July 8th

On-campus lecture days: Saturday/ June 11th & June 25th

This course discusses technical and operational aspects of Internet of Things (IoT). IoT is rapidly emerging as a system of connected devices and is expected to provide unprecedented connectivity and remote accessibility to things that we use in almost every domain of life including healthcare, transportation, agriculture, and energy. The number of connected devices is anticipated to exceed 50 billion by 2030. The course will focus on recent IoT advances and innovative applications.

Note: The Saturday classes are recorded and made available on Canvas.