

CSC Special Topics Courses for Spring 2019

1. **CSC 9010-001 TOP: Seminar in Deep Learning CRN: 32064**
W 6:15-9:00pm, Instructor: Benjamin R Mitchell

Deep Learning is the study of computational learning systems that utilize repeated composition of simple functional elements to produce complex behavior. These methods are currently state-of-the-art on a wide range of problems, and are deployed in areas like computer vision, natural language processing, audio analysis, and game AI. As a result, they have received a great deal of attention in recent years, both in academia and in industry, with companies like Google and Facebook investing heavily in this area.

This class will be a seminar style exploration of the field of deep learning, including both its historical roots and the current state of the art. Weekly assignments will consist primarily of reading selected papers from the literature and writing short responses on them, as well as participating in in-class discussions. Students will also help lead these discussions. The culmination of the semester will be writing a scientific paper (either a review paper giving a survey of the field, or a conference style paper on a student project).

2. **CSC 9010-002 TOP:Offensive Security CRN: 32065**
T 6:15-9:00pm, Instructor: Henry L. Carter

Hacking computer systems and networks has been widely discussed in today's news and has been dramatized in entertainment as an activity for criminals and misfits. However, the vast majority of the public has no concept of how breaches are performed in practice. In this course, students will learn in a hands-on lab setting about the underlying computing concepts behind breaking a system, the techniques that are used, and tools that allow these hacks to be carried out. In addition, this course will delve into the ethical impact of real-world breaches, and will discuss techniques that could have been applied to mitigate the attacks. Finally, the course will examine ways that students can apply their knowledge of hacking for positive uses that improve the security of the Internet and could lead to careers in cybersecurity. If you are curious about what hacking really looks like, have experience in networks and operating systems, and enjoy solving challenging puzzles, this course is for you.

3. **CSC 9010-003 TOP:Computing for Data Science CRN: 32066**
R 3:00-5:45pm, Instructor: Lillian Cassel

Data Science is an inherently interdisciplinary subject, requiring components of computer science, statistics, and some domain to provide the data and the problems to solve. In this course, we focus on the computer science components of data science. We will use the Python programming language and libraries that support managing datasets, libraries such as pandas, numpy, and scikit-learn for machine learning. We will work with a variety of large datasets. Topics will include data cleaning, data wrangling (reorganizing datasets), visualization, time series, machine

learning fundamentals. Students will select a project to complete during the semester to exercise a good collection of these elements. The course will be graded based on frequent quizzes, weekly programming assignments, and the final project.

4. **CSC 9010-003 TOP: Cloud Native AppDesign&Dev CRN: 32067**

M 6:15-9:00pm, Instructor: Juan Carlos Vega

Cloud computing is a shared platform where users can consume storage, processing power, and other services on demand, without having to physically add more system resources to their environments. This course focuses on exploring and using such technologies to create innovative and complex business solutions that can drastically reduce the cost of creating such solutions, while offering new career opportunities for software and solution engineers looking to stay on the leading edge of the technology industry.

The course will explore the three companies that are often associated with Cloud Computing – Microsoft, Amazon, and Google. Each company has significantly contributed to growing the cloud platform and so, we will take an in-depth look at what each has to offer.

The learning objectives are to gain a thorough understanding of how to create real world applications using current cloud technologies; deep understanding of the cloud computing solution offerings from Amazon, Microsoft, and Google; a basic understanding of emerging technologies, such as OpenShift, Kubernetes, Heroku, Netflix OSS, and others; and, high level understanding of key concepts such as Cloud Provisioning and Orchestration.

Students should have a basic understanding of Cloud Computing Technologies, Development Environments and IDEs, and Programming Concepts & Languages.