**Computer Science - New Courses for 2020-2021**

## Algorithms and Complexity

### CSCI 435

This course provides an introduction to some fundamental areas of research in algorithms and computational complexity theory. Flow networks and randomized, approximation, parameterized, and online algorithms and complementary techniques in hardness of approximation and lower bounds are presented. This course is a broad exploration of these topics to provide a well-rounded introduction to modern theories in algorithms and theoretical computer science. Prerequisites:
CSCI 355, or permission of the chair.
Recommended: CSCI 356. Three credits. Next offered 2020-2021

## Machine Learning

### CSCI 444

This course covers modern technologies in computational machine learning. Validation of machine learning algorithms will be taught alongside computational design considerations for the creation of reliable and robust machine learning models. Machine learning techniques will be taught in detail from a computational technology perspective, including decision trees, bootstrapping, bagging, super learners, AdaBoost, artificial & convolutional neural networks and methods for minimizing error on unseen data. Classical learning techniques will also be presented. Prerequisites: CSCI 161, STAT 224 or 231 or 101 or permission of department chair. Three credits. Next offered 2020-2021

## Approximation Algorithms

### CSCI 550 – Graduate Course

Approximation algorithms are efficient algorithms that are guaranteed to compute solutions such that the value of the solution is provably close to the optimum. This course provides an introduction at the graduate level to the area of approximation algorithms, highlighting key algorithm design techniques for approximation algorithms and the complementary study of hardness of approximation for hard optimization problems. Three credits. Only available to graduate students, or permission of the chair.