

# DATA SCIENCES AND OPERATIONS

FALL 2024 SEMESTER

## DSO 562 — *Fraud Analytics*

Section 372-16294R

### Professor

Stephen Coggeshall

### Email

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### When

Thursdays 2 – 4:50

### Office

TBD

### Units

3.0



## WHY TAKE THIS COURSE?

This course provides a very good transition to a real-world working environment, taught in the context of building practical fraud models. In addition to describing all the required steps in building business predictive models we execute three very realistic business analytics problems for fraud detection.

## COURSE OBJECTIVES

Prepare students to solve practical business analytics problems in a work environment; understand all steps required to build industry-standard fraud algorithms; overview of high-level machine learning steps for building predictive models.

## KEY CONCEPTS

How businesses build and use fraud algorithms; all steps in building predictive models: data cleaning, feature creation, feature selection, model exploration and tuning, model evaluation, business report writing. Encoding categorical fields, trees (DT, RF, BT), neural nets, overfitting, PCA, distance measures, score scaling and calibration. Supervised and unsupervised model development.

## COURSE DESCRIPTION

We cover all aspects of building practical business fraud algorithms. The students execute three projects starting from realistic, dirty data, through all steps to build realistic fraud models, and then write a professional model business report for each project. This course is less academic than most and we emulate developing practical business algorithmic solutions in a real-world working environment. At the completion of this course the students will be able to (1) knowledgeably converse with any fraud algorithmic expert, (2) build fraud algorithms on hard data sets, and (3) be better prepared to make the transition to a working business environment. Some Python require, but the course emphasis is on concepts rather than coding.