SU DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

SYLLABUS (Tentative)

MATH 490—Special Topics: *Prediction Methods*

OBJECTIVES: To introduce students to popular methods for using data to make predictions; to introduce students to the R programming language via RStudio

INTENDED FOR: Junior- and senior-level mathematics and computer science majors

PREREQUISITES: MATH 202, MATH 216, and COSC 117

TEXTS: 1) *Who's #1?: The Science of Rating and Ranking*, by Amy N. Langville and Carl D. Meyer, Princeton University Press 2012, ISBN 978-0691154220
2) *Introduction to Stochastic Processes with R*, by Robert P. Dobrow, John Wiley & Sons, Inc. 2016, ISBN 978-1118740651

TECHNOLOGY: R programming language via RStudio

TOPICS/COURSE COVERAGE:

	No. of Weeks
Introduction to R and RStudio/Data Analysis Preliminaries, R scripts, data frames, importing and exporting data, basic data analysis	**3**
Ranking and Rating Methods Simple winning percentage, Massey's method, Colley's method, handling ties, incorporating weights, applications to sports forecasting	**5**
Stochastic Processes and Simulation Deterministic and stochastic models, stochastic processes, Monte Carlo simulation, Markov chains, applications to stock market forecasting	**5**
Midterm Exam/Presentations	**1**

EVALUATION

Homework:	30%
Projects/Presentations:	30%
Midterm Exam:	20%
Final Exam:	20%