Course Description

This course provides an overview of Information System-based financial transaction systems and their role in portfolio selection for the Financial Sector. Topics include portfolio selection, rebalancing and performance monitoring from the standpoint of artificial intelligence learning techniques. This course covers stock selection/filtering, building robust scalable models, identifying statistical deviations, arbitrage market theories, managing risk and measuring the performance of various quant models.

Class Time

This class is offered asynchronously online. While you control when you watch videos and work on assignments, be aware of course pacing and specific deadlines.

Instructor Information

Dr. Robert P. Schumaker
Professor, Computer Science Dept.
rschumaker@uttyler.edu

Office Hours

DM through Slack (preferred), Zoom, email
       If your inquiry is grade-related, please make a Zoom or physical appointment

Textbook Information

If you are a beginner in financial investments and have the time this semester consider this companion book. Otherwise, this book is optional.
A Quantitative Primer on Investments with R (Rosenthal)
ISBN: 978-1-7322356-0-1

Required:
Reproducible Finance with R (Regenstein)
ISBN: 978-1-1384-8403-0

If you are advanced in financial investments and have the time this semester consider this companion book. Otherwise, this book is optional.
Applied Probabilistic Calculus for Financial Engineering (Chan)
ISBN: 978-1-119-38761-9

Course Objective

This course is designed with the following goals:
- Identify machine learning techniques for portfolio management
- Develop a repertoire of robust models for stock selection
- Recognize arbitrage opportunities in data, systems and environment
- Evaluate investment model performance

Computer Account Access
Students will need a Patriot account and password for computer access. This information can be found at `https://www.uttyler.edu/ccs`

Course Documents and Slides
This class will use Canvas for course documents, slides, quizzes and other class-related materials. Students are encouraged to check the website frequently during the course of the semester to keep up to date about course activity.

Course Grading
Course evaluation will be based on the following:

Quizzes (5 @ 20 points each)	100
Total Points	100

Grading Scale
A 85.0 points or more
B 70.0 to 84.999 points
C 55.0 to 69.999 points
D 40.0 to 54.999 points
F 39.999 points or less

Course Policies
1. Quizzes – Quizzes will be given throughout the course and will test the student's mastery of the material. Missed quizzes cannot be made up without acceptable emergency-related documentation.

Tentative Course Schedule and Assignments

Date	Concept	Readings	Quizzes
Jan 13-19	Introduction to Quantitative Investing		
	R for Quantitative Investing	Ch 1	
Jan 20-26	Asset Prices to Returns	Ch 2	
	Building a Portfolio	Ch 3	Q1
Jan 27-Feb 2	Portfolio Fundamentals vs Technical Analysis		
	Portfolio Regression and Time-Series Analysis		Q2
Feb 3-9	Sectors, Industries, and Portfolio Rebalancing		
	Machine Learning and Portfolio Management		Q3
Feb 10-16	Sharpe Ratio	Ch 7	
	CAPM	Ch 8	Q4
Feb 17-23	Fama-French Factor Model	Ch 9	
	Monte Carlo Simulation	Ch 11	Q5
Feb 24-Mar 1	High Frequency Trading		
	Research Talk - Evaluating Sentiment		