CSCI 5348 - Quantitative Investing – Spring 2026 (3 credits)

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 quantitative models. (The weekly workload may span 9 to 18 hours approximately.)

Course Modality and Section Number

Online Asynchronous Mode (7-week schedule); Section No.: 2026-SPRING7WK1-CSCI-5348.060

Instructor Information

Dr. Wingyan Chung (wchung@uttyler.edu, office: COB 315.09)
Professor, Computer Science Dept.

Instructor Office Hours

Tuesday and Wednesday 9:30 am - 2:30 pm, and by appointment
Emails will normally be answered within 2 business days; emails received during Friday–Sunday will be answered by the following Tuesday. Students should NOT use the Canvas messaging system to communicate with the instructor, as Canvas lacks certain messaging features and can cause delay.

Textbook Information

The following textbooks are required throughout the semester and are available from the university bookstore and the websites linked below.

- [R] = S. Smart & C. Zutter "Fundamentals of Investing, 14th edition," MyLab Finance with Pearson eText (ISBN-13: 9780135179314 (2019 update)) – students are required to click "Access Pearson" in Canvas and create/register their @partriot.uttyler.edu account to use MyLab Finance.
- [J] = S. Jansen "Machine Learning for Algorithmic Trading, 2nd edition," Packt Publishing (ISBN-13: 9781839216787 (2020)) (access to library full text).

Course Objectives

Upon successful completion of this course, students should be able to:

- Explain concepts and techniques related to quantitative investing in finance,
- Identify machine learning (ML) techniques for portfolio management,
- Develop a repertoire of robust ML models for portfolio selection,
- Recognize arbitrage opportunities in data, systems, and environment, and
- Evaluate investment model performance.

Course Materials and Submissions

This class uses Canvas for dissemination of course materials, submission of assessment items, assignments, online discussions, quizzes and other class-related materials (items hosted on other sites are linked directly from Canvas). Students should check the Canvas site frequently during the semester to keep up to date about course activities (note: due dates of assessment items hosted on Canvas-linked

sites may not appear in the Canvas calendar). All submissions are due by 11:59:00 pm on the due date (except otherwise stated). Students should submit their work early to avoid last-minute hassles. Email submission is NOT accepted.

Course Grading

Assessment of student performance will be based on the following:

Prefix	Category	Points
A	Assignments (5×14 pts.)	70
Q	Quiz (2×15 pts.)	30
Total Points		100

Grading Scale

A = 85.0 points or more
B = 70.0 to less than 85.0 points
C = 60.0 to less than 70.0 points
D = 50.0 to less than 60.0 points
F = Less than 50.0 points

Grade Composition

1. Assignment (A) – Individual, untimed, open-book, open-notes, assignments will contain objective questions, computer exercises, cases, and/or short-answer questions to help students review and practice course concepts and skills. Pause-and-resume is allowed before the submission deadline. Late submission (within 2 days after due date) will incur a 30% deduction in score. Submission is closed afterward. Missed submission will result in a zero score and cannot be made up (except for compliance with "Make-up or Extension" policy (see below)).

2. Quiz (Q) – Individual, timed, one-sitting, open-book, open-notes written quizzes will help students retain knowledge and assess learning outcomes. Objective-type questions (e.g., multiple choice, vocabularies, multiple selections, calculation, short explanations) may appear in the quizzes. No pause and no late submission is allowed. Missed submission will result in a zero score and cannot be made up (except for compliance with "Make-up or Extension" policy (see below)).

Course Policies

1. Make-up or Extension – Make-up or extension for missed submissions are available ONLY for valid reasons pre-approved by the Office of Student Accessibility and Resources (SAR) or for serious sickness / emergencies (with doctor's notices / proper documentations submitted prior to or in the same week of the deliverable) approved by the Campus Assessment, Response, & Evaluation (CARE) team. To be considered for make-up or extension (normally within 2 days after submission is closed), students must arrange with the aforementioned authorities and contact the instructor before the due date of the assessment items. *Note*: Technical issues beyond the control of the university are NOT considered as valid reasons for make-up or extension of missed submissions.

2. Student Responsibility – Students are required to take timely actions according to the course schedule, check the learning management system and their university email regularly, ensure

proper technical setup in their environment (e.g., computer software and hardware, Internet access, file backup and transfer), and complete all course-related tasks on time. Students should behave properly to facilitate active class learning.

3. Academic Integrity – Any act or attempt of academic dishonesty, such as (but not limited to) plagiarism, cheating, collusion, falsifying records, and copyright infringement, is strictly prohibited and will be punished according to the university policies (e.g., §8-802).

4. UT Tyler AI Statement – UT Tyler is committed to exploring and using artificial intelligence (AI) tools as appropriate. For this course, students must complete all assessment items exclusively by themselves. When use of AI tools is permissible in specific assessment items, it will be clearly stated in the directions, and all use of AI tools must be appropriately acknowledged and cited. Otherwise, the default is that AI tools are not allowed during any stage of an assessment.

Course Schedule

Start Date	Week	Topic	Materials	Due
1/12	1	Introduction to Quantitative Investing Basic Excel and Python Skills	Syllabus R1, R2, R4	M, QS
1/19	2	Asset Pricing and Modern Portfolio Concepts: CAPM Machine Learning for Portfolio Management	R3, R4a, R5 J1	A1
1/26	3	Portfolio Selection: Fundamental vs. Technical Analyses The Fama-French Factor Model	R7, R8 J4, J7	A2
2/2	4	Market Efficiency and Arbitrage Predicting Price Movement with Linear Models	R9 J6, J7	A3, Q1
2/9	5	Portfolio Evaluation and Rebalancing Time-Series Models for Market Forecast	R13, J5 J9	A4
2/16	6	Mutual Funds and Exchange-Traded Funds Sentiment Analysis using Textual Data	R12 J14	A5
2/23	7	Deep Learning for Trading Word Embeddings for Earnings Calls Analysis	J17 J16	Q2

Remarks

R – Course textbook chapter(s) by Smart & Zutter
J – Course textbook chapter(s) by Jansen
M – repeatable MyLab Finance orientation test via Pearson
QS – Repeatable Syllabus Quiz (available in the UT Tyler Syllabus module). A satisfactory score is required to access subsequent modules.
A – Assignment
Q – Quiz (Coverage: Q1: Weeks 1-3 materials; Q2: Weeks 4-7 materials; *Note*: each quiz opens from Thursday to Sunday of the week)