



1. General Information

Course Subject	IIMT
Course Number	3641
Course Title	Introduction to Financial Analytics
Academic Years	2024-2025
Grading Method	Letter

2. Instructors

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4. Course Description

Course Description	This course provides introduction to analytics used in quantitative finance and aims at equipping students with basic analytical knowledge and practical skills in solving investment and risk management problems. The course content is organized by main financial instruments: fixed-income securities, stocks, and financial derivatives; fundamental analytics for each instrument type will be taught. Implementation (e.g., fitting interest rate term structures, portfolio construction, pricing options by simulation, etc.) by developing analytics in spreadsheet/VBA or Python with financial data will also be emphasized. The main topics include bond mathematics, modern portfolio theory, Black-Litterman model, and basic financial derivatives.
Prerequisites	FINA2320 Investments and portfolio analysis; or STAT3609 The statistics of investment risk; or STAT3952 Investment and asset management; or IIMT2641 Introduction to business analytics; or IIMT3636 Decision and Risk Analysis I

5. Course Objectives

1. Be fluent in applying basic models/analytics that are commonly used in financial industry
2. Be able to select models and analytics suitable for a specific investment or risk management problem setting
3. Be able to quantitatively analyze investment and risk management problems
4. Be able to implement the methods and analytics with financial data

6. Faculty Learning Goals

- Goal 1: Acquisition and internalization of knowledge of the programme discipline
- Goal 2: Application and integration of knowledge

6. Faculty Learning Goals
Goal 3: Inculcating professionalism
Goal 4: Developing global outlook
Goal 5: Mastering communication skills
Goal 6: Cultivating leadership

7. Course Learning Outcomes						
Course Teaching and Learning Activities	Aligned Faculty Learning Goals					
	1	2	3	4	5	6
CLO1. Select appropriate and effective model to clearly define and formulate problems encountered in investment and risk management setting.	✓	✓				
CLO2. Be adept at applying the methods and techniques learnt.	✓	✓				
CLO3. Demonstrate proficiency in implementing the models/methods with financial data using spreadsheet/VBA modeling or Python.		✓				
CLO4. Effectively communicate ideas, clearly explain solution approaches, and interpret the results with insights.			✓		✓	

8. Course Teaching and Learning Activities		
Course Teaching and Learning Activities #	Expected Study Hours	Study Load (% of study)
T&L1. Lectures	36	30
T&L2. Tutorials	12	10
T&L3. Assignments	36	30
T&L4. Self-study	36	30
	Total: 120	Total: 100

9. Assessment Methods			
Assessment Methods	Description	Weight %	Aligned Course Learning Outcomes
A1. Assignments		20%	1,2,3,4
A2. Midterm Exam		30%	1,2,3,4
A3. In-class participation		10%	4
A4. Final Exam		40%	1,2,3,4

10. Course Grade Descriptors

A+,A,A-	<ul style="list-style-type: none"> • Demonstrate strong understanding of all relevant knowledge. • Able to apply appropriate method to each specific problem. • Capable in implementation with data. • Active in class and contribute meaningful discussions.
B+,B,B-	<ul style="list-style-type: none"> • Demonstrate good understanding of all relevant knowledge. • Tends to apply the methods learnt appropriately. • Can implement models with data but might need guidance. • Active in class.
C+,C,C-	<ul style="list-style-type: none"> • Have basic understanding of course content but cannot apply the knowledge appropriately. • Show effort in implementation but have major difficulty. • Not active in class.
D+,D	<ul style="list-style-type: none"> • Show some efforts, but only have a minimum understanding of the course content. • Incapable of implementation. • Not active in class.
F	<ul style="list-style-type: none"> • No efforts are shown.

11. Course Content and Tentative Teaching Schedule

Topic/ Session	Content
1	<ul style="list-style-type: none"> - Introduction: problem categories, objectives and methods - payoff structure of bonds - present value analysis; bond price-yield relation; yield curve
2	<ul style="list-style-type: none"> - spot rate and spot rate term structure - forward rate and forward rate term structure
3	<ul style="list-style-type: none"> - durations and immunization - Implementation examples for bonds: curve fitting technique; fitting term structures from bond price data
4	<ul style="list-style-type: none"> - risk and return basics for stock - Markowitz models: formulation and variants
5	<ul style="list-style-type: none"> - Solution structures for Markowitz models and insights - Portfolio efficiency - Mean-variance efficient frontier
6	<ul style="list-style-type: none"> - Capital Asset Pricing Model (CAPM) - security market line - Portfolio performance assessment: alpha and Sharpe's index
7	<ul style="list-style-type: none"> - Critique on Markowitz models - Fuzzy mean issue - Black-Litterman Model - Midterm Exam
8	<ul style="list-style-type: none"> - Black-Litterman Model (ct'd)- Implementation examples for stock portfolios: getting risk parameters from stock price data; portfolio construction; portfolio performance assessment
9	<ul style="list-style-type: none"> - Introduction to financial derivatives - Forwards and futures - No-arbitrage arguments
10	<ul style="list-style-type: none"> - Option basics, payoff functions - Common option strategies
11	<ul style="list-style-type: none"> - Lognormal distribution and stock price model

11. Course Content and Tentative Teaching Schedule

	- High-level introduction of Black-Scholes model
12	- Relationship between no-arbitrage pricing and risk neutral pricing (illustrated under binomial tree) - Greeks, Delta-hedging and payoff replication
12	- Implied volatility and volatility smile - Implementation examples for options: implied volatility; Delta-hedging; risk-neutral pricing by simulation - Wrap-up and pointer to future directions - Review

12. Required/Recommended Readings & Online Materials

Reading	To be announced on Moodle.
Textbook	The following books are recommended references but not required. [L] Luenberger, D.G., Investment Science, Oxford University Press, New York, 1998. [H] Hull, J.C., Options, Futures, and Other Derivatives, latest ed., Prentice Hall, Upper Saddle River, NJ.

13. Means / Processes for Student feedback on Course

✓	Conducting mid-term survey in additional to SETL around the end of the semester
✓	Online response via Moodle site
✓	Others
	SFTL

14. Course Policy

An orderly learning environment is extremely important for this course. Disruptive behaviors are inconsiderate to other students as well as to the instructor and are absolutely unacceptable. Talking during lectures, arriving to class late, and any other disruptions of mobile devices are not allowed; students who are responsible for any of these actions will be subject to academic penalty and will be asked to leave the classroom.

Any dishonesty—such as cheating, false representation, plagiarism, etc.—that comes to my attention will result in an F in the course.

Academic dishonesty includes cheating, plagiarism, unauthorized collaboration, falsifying academic records, and any act designed to avoid participating honestly in the learning process. Scholastic dishonesty also includes, but is not limited to, providing false or misleading information to receive a postponement or an extension on an exam or other assignment. The responsibilities of both students and faculty with regard to scholastic dishonesty are described in detail in the Disciplinary Committee Regulations. By teaching this course, I have agreed to observe all of the faculty responsibilities described in that document. By enrolling in this class, you have agreed to observe all of the student responsibilities described in that document. If the application of that policy statement to this class and its assignments is unclear in any way, it is your responsibility to ask me for clarification.

Students are encouraged to give feedback on the course through mid-term survey in additional to SETL around the end of the semester and online interaction via Moodle site.

15. Additional Course Information

Please check the course website on Moodle on a regular basis. Feedback (in-person or by email) is highly encouraged.