

MA6631: SPECIAL TOPICS

Effective Term

Semester B 2024/25

Part I Course Overview

Course Title

Special Topics

Subject Code

MA - Mathematics

Course Number

6631

Academic Unit

Mathematics (MA)

College/School

College of Science (SI)

Course Duration

One Semester

Credit Units

3

Level

P5, P6 - Postgraduate Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

MA5616 Financial Mathematics in Derivative Markets;
MA5617 Statistical Data Analysis

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

This course may include one or two topics in a current or timely trend in mathematical finance. Topics may vary among big data analysis, stochastic control theory, and computing technology oriented to various financial applications. A successful student is expected to integrate mathematical knowledge and analytical techniques of diverse subjects to catch up new methodologies not available from the standard textbook, and shall complete independently an essay at the end.

Course Intended Learning Outcomes (CILOs)

CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1 formulate the structure of one or two proposed topics in general terms, and outline several examples of real applications in economics and finance.	25	x		
2 explain the classical approaches and methodologies applicable to the aforementioned topics	25	x	x	
3 digest current trend and new approaches from recent related literatures, and explore new discoveries independently if possible.	50	x	x	x

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1 take-home assignments	Learning through take-home assignments helps students implement advanced theory for better understanding	1, 2	After-class
2 project/(s)	Learning through project(s) enables students to formulate more sophisticated problems related to the current topics	3	After-class

Assessment Tasks / Activities (ATs)

ATs		CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Test	1, 2	25	25--50%
2	Hand-in assignments	1, 2	25	0--25%
3	Essay	3	50	25--50%

Continuous Assessment (%)

100

Additional Information for ATs

100% Coursework

Assessment Rubrics (AR)**Assessment Task**

1. Test (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Problem solving based on comprehensive understanding of mathematical finance

Excellent

(A+, A, A-) Consistently demonstrates a thorough understanding of mathematical knowledge and analytical techniques and can always apply them to solve complex problems in economics and finance

Good

(B+, B, B-) Adequately demonstrates an understanding of mathematical knowledge and analytical techniques and can usually apply them to solve problems in economics and finance

Fair

(C+, C, C-) Demonstrates some understanding of mathematical knowledge and analytical techniques and can sometimes apply them to solve simple problems in economics and finance

Marginal

(D) Demonstrates limited understanding of mathematical knowledge and analytical techniques and can seldom apply them to solve simple problems in economics and finance

Failure

(F) Demonstrates little understanding of mathematical knowledge and analytical techniques and cannot apply them to solve simple problems in economics and finance

Assessment Task

2. Hand-in assignments (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Problem solving based on comprehensive understanding of mathematical finance

Excellent

(A+, A, A-) Consistently demonstrates a thorough understanding of mathematical knowledge and analytical techniques and can always apply them to solve complex problems in economics and finance

Good

(B+, B, B-) Adequately demonstrates an understanding of mathematical knowledge and analytical techniques and can usually apply them to solve problems in economics and finance

Fair

(C+, C, C-) Demonstrates some understanding of mathematical knowledge and analytical techniques and can sometimes apply them to solve simple problems in economics and finance

Marginal

(D) Demonstrates limited understanding of mathematical knowledge and analytical techniques and can seldom apply them to solve simple problems in economics and finance

Failure

(F) Demonstrates little understanding of mathematical knowledge and analytical techniques and cannot apply them to solve simple problems in economics and finance

Assessment Task

3. Essays (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Creativity based on learning, software usage, and data analysis ability

Excellent

(A+, A, A-) Consistently exhibits a thorough understanding of the mathematical finance in the essay

Good

(B+, B, B-) Sufficiently demonstrates comprehension of the mathematical finance in the written report

Fair

(C+, C, C-) Displays a moderate and intermediate grasp of the the mathematical finance, clearly articulated in the essay

Marginal

(D) Demonstrates some understanding of the mathematical finance in the essay

Failure

(F) Demonstrates little understanding of the mathematical finance in the essay

Assessment Task

1. Test (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Problem solving based on comprehensive understanding of mathematical finance

Excellent

(A+, A, A-) Consistently demonstrates a thorough understanding of mathematical knowledge and analytical techniques and can always apply them to solve complex problems in economics and finance

Good

(B+, B) Adequately demonstrates an understanding of mathematical knowledge and analytical techniques and can usually apply them to solve problems in economics and finance

Marginal

(B-, C+, C) Demonstrates limited understanding of mathematical knowledge and analytical techniques and can seldom apply them to solve simple problems in economics and finance

Failure

(F) Demonstrates little understanding of mathematical knowledge and analytical techniques and cannot apply them to solve simple problems in economics and finance

Assessment Task

2. Hand-in assignments (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Problem solving based on comprehensive understanding of mathematical finance

Excellent

(A+, A, A-) Consistently demonstrates a thorough understanding of mathematical knowledge and analytical techniques and can always apply them to solve complex problems in economics and finance

Good

(B+, B) Adequately demonstrates an understanding of mathematical knowledge and analytical techniques and can usually apply them to solve problems in economics and finance

Marginal

(B-, C+, C) Demonstrates limited understanding of mathematical knowledge and analytical techniques and can seldom apply them to solve simple problems in economics and finance

Failure

(F) Demonstrates little understanding of mathematical knowledge and analytical techniques and cannot apply them to solve simple problems in economics and finance

Assessment Task

3. Essays (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Creativity based on learning, software usage, and data analysis ability

Excellent

(A+, A, A-) Consistently exhibits a thorough understanding of the mathematical finance in the essay

Good

(B+, B) Sufficiently demonstrates comprehension of the mathematical finance in the written report

Marginal

(B-, C+, C) Demonstrates some understanding of the mathematical finance in the essay

Failure

(F) Demonstrates little understanding of the mathematical finance in the essay

Part III Other Information

Keyword Syllabus

Key words may vary term by term

Reading List

Compulsory Readings

Title	
1	Course materials provided

Additional Readings

Title	
1	Nil