

# EF5213: FINANCIAL COMPUTING

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## Effective Term

Semester A 2025/26

## Part I Course Overview

### Course Title

Financial Computing

### Subject Code

EF - Economics and Finance

### Course Number

5213

### Academic Unit

Economics and Finance (EF)

### College/School

College of Business (CB)

### Course Duration

One Semester

### Credit Units

3

### Level

P5, P6 - Postgraduate Degree

### Medium of Instruction

English

### Medium of Assessment

English

### Prerequisites

Nil

### Precursors

EF5050 Derivatives and Risk Management  
EF5210 Option Pricing  
EF5250 Stochastics & Calculus for Finance

### Equivalent Courses

Nil

### Exclusive Courses

Nil

## Part II Course Details

### Abstract

This course aims to enable students to apply integrated spreadsheet programming skills to solve real-life financial problems, to equip students with the capability of performing numerical computations in financial engineering, to provide students with the practical knowledge of modern financial models.

### Course Intended Learning Outcomes (CILOs)

CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Apply integrated programming skills to design effective solution for real-life financial problems.	x	x	
2	Discuss the key elements of numerical computation in financial engineering, and develop flexible and robust solutions with good programming practices.	x	x	
3	Apply the numerical techniques in financial engineering to design complex algorithms and solutions for modern financial models.		x	x
4	Apply the practical knowledge in financial modelling to develop integrated numerical solutions for real market products.		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	Lectures, class discussions, and computer laboratories	Students will engage in formal lectures that will explain key concepts and theories of modern financial models and numerical computation in lectures.  Deliver key numerical techniques and practical knowledge for computer implementation in laboratories.	1, 2, 3, 4	3

### Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Assignments and laboratory work	1, 2, 3, 4	100	For Assignments and Group Project, students can use Generative Artificial Intelligence Tools to help them understand the concepts/ questions/ problems, or analyze data. But the final version must be their own work, e.g., students cannot copy and paste the AI answers as their own answers. Students are not allowed to use Generative Artificial Intelligence Tools in mid-term examination(s)/ quiz(zes).	Yes

**Continuous Assessment (%)**

100

**Examination (%)**

0

**Assessment Rubrics (AR)****Assessment Task**

Assignments and laboratory work (for students admitted before Semester A 2022/23 and in Semester A 2024/25 &amp; thereafter)

**Criterion**

Demonstrates understanding of the financial models.

Ability to deliver effective, efficient, flexible, and robust computer solutions with good programming practices.

**Excellent**

(A+, A, A-) High

**Good**

(B+, B, B-) Significant

**Fair**

(C+, C, C-) Moderate

**Marginal**

(D) Basic

**Failure**

(F) Not reaching marginal level

**Assessment Task**

Assignments and laboratory work (for students admitted from Semester A 2022/23 to Summer Term 2024)

**Criterion**

Demonstrates understanding of the financial models.

Ability to deliver effective, efficient, flexible, and robust computer solutions with good programming practices.

**Excellent**

(A+, A, A-) High

**Good**

(B+, B) Significant

**Marginal**

(B-, C+, C) Basic

**Failure**

(F) Not reaching marginal level

**Part III Other Information****Keyword Syllabus**

Numerical and Statistical Computations

GARCH(1,1) Model

Finite Difference Method and Crank-Nicholson Scheme

Portfolio Mean-Variance Optimization and Markowitz Algorithm

Multi-variable Newton-Raphson Procedure

Yield Curve Construction using Cubic Spline Binomial Tree Pricing of Exotic Options

Black-Derman-Toy Model for Interest Rate Derivatives

Monte-Carlo Option Pricings

Least-Square Monte-Carlo Pricings of American Options

**Reading List****Compulsory Readings**

Title	
1	Humphrey Tung, Donny Lai, and Michael Wong with Stephen Ng, Professional Financial Computing Using Excel & VBA, John Wiley & Sons, Singapore, 2010, ISBN 978-0-470-82439-9.

**Additional Readings**

Title	
1	Nil