Financial Technology and digital innovation to modeRnise and develop cUrricula of VietnameSe and Philippines UniversiTies

Project № 610256-EPP-1-2019-1-IT-EPPKA2-CBHE-JP

MASTER IN FINTECH AND DIGITAL INNOVATION

- MODULE SYLLABUS -

Co-funded by the Erasmus+ Programme of the European Union

DELIVERABLE DESCRIPTION	
Deliverable number and name	MASTER IN FINTECH AND DIGITAL INNOVATION - MODULE SYLLABUS -
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Table of Contents

1. Module details 4
2. Module description 4
3. Learning Outcomes 4
4. Module knowledge, skills and competencies (EQF*) 5
5. Module lessons 5

1. Module details

Module Title	Analytics and Programming in Finance
Credits	/
Hours	
N° of hours in presence	
N° of hours in distance learning	*At least 15*
Name of the leading institution	

2. Module description

This course develops the use of analytical techniques and the basic programming elements required for applying computational methods in finance. The course covers basic and advanced statistical and optimization approaches to data analytics and their application in various areas in FinTech with software packages Python and R. The key topics cover: descriptive analytics including basic probability and statistics, categorical data, time series data, regressions models, predictive analytics techniques and prescriptive analytics including linear programming, integer programming, dynamic programming, stochastic programming, game theory. The emphasis is on the application to practical problems, such as: asset pricing, derivatives, proprietary trading, portfolio management and other problems related to financial service industry.

3. Learning Outcomes

The course overall learning outcomes are:

Knowledge and Understanding:

a. Demonstrates a critical understanding of technology-based banking concepts (e.g. digital banking, open banking, etc.);
b. Demonstrates understanding and awareness of emerging technological enablers in banking and finance (e.g. digitalisation, automation, machine learning, AI, etc.);
c. Demonstrates a critical awareness of current, emerging and future issues for FinTech.

Application and Problem-Solving Abilities:

a. Applies a significant range of specialist database and software operating, programming and other FinTech relevant skills;

4. Module knowledge, skills and competencies (EQF*)

Moreover, at the end of this course, the student will be able to (*https://europa.eu/europass/en/european-qualifications-framework-eqf) :

- Collect, manage, and analyze data from different sources;
- Analyze and model specialized and complex problems in finance;
- Critically compare, contrast and evaluate the different analytics techniques for applicability to identified problems;
- Establish use of analytic techniques for finance applications;
- Apply numerical analysis and programming in Python and R to solve financial problems;
- Analyze, reports, demonstrate and implement obtained solutions.

5. Module lessons

Lesson N.	1
Lesson title	Fundamentals of Analytics
Duration	1h
Specific objectives	Provide students the core concepts of analytics and the role of data analytics in finance
Topics	• Developing Analytical Thinking • Descriptive Analytics • Predictive Analytics • Prescriptive Analytics • Data Driven Finance • Analytics in Finance.
In presence activity	• Lectures • lecture discussion
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note

	• Audio/Video Lesson
Other supporting material	

Lesson N.	2
Lesson title	Collecting, Sorting, Prioritizing, and Storing Big Data
Duration	1h
Specific objectives	Provide students the understanding of data and the knowledge about data capturing and manipulation
Topics	• Finding and Capturing the Right Data • Data Sampling and Preparation • Data Segmentation • Data Warehousing • Data Security • Fitting Analytics Models to Data
In presence activity	• Lectures • lecture discussion
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson
Other supporting material	Min, H. (2016). *Global business analytics models: Concepts and applications in predictive, healthcare, supply chain, and finance analytics*. FT Press. (Chapter 2)

Lesson N.	3
Lesson title	Introduction to R Language for Statistical Computing
Duration	1h

Specific objectives	Provide students core concepts of R
Topics	• Language Features: Functions, Assignment, Arguments, Types, Binding, and Arrays • Error Handling • Numeric, Statistical, and Character Functions • Data Frames and Input–Output • Lists
In presence activity	• Lectures • lecture discussion • programming demonstration • programming exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson
Other supporting material	Bennett, M. J., & Hugen, D. L. (2016). *Financial analytics with R: building a laptop laboratory for data science*. Cambridge University Press. (Chapter 2)

Lesson N.	4
Lesson title	Descriptive Analytics (1) - Basic Statistical Tools
Duration	1h
Specific objectives	Provide students the knowledge about basic statistical elements, methods and techniques.
Topics	• Probability, Combinatorics, Mathematical Expectation, Sample Mean, Standard Deviation, and Variance, Sample Skewness and Kurtosis, Sample Covariance and Correlation • Statistical Distributions • Examples Applying Statistics to Financial Data

In presence activity	• Lectures • lecture discussion • exercise
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson
Other supporting material	Tsay, R. S. (2014). *An introduction to analysis of financial data with R*. John Wiley & Sons. (Chapter 1)

Lesson N.	5
Lesson title	Descriptive Analytics (2) - Financial Statistics in R
Duration	1h
Specific objectives	Provides the students the knowledge about features of R for financial statistics and skills to use them in real problems.
Topics	• Calculating Financial Returns in R • Solving Capital Asset Pricing Model in R
In presence activity	• Lectures • lecture discussion • programming demonstration • programming exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson • Self-evaluation test
Other supporting material	Bennett, M. J., & Hugen, D. L. (2016). *Financial analytics with R: building a laptop laboratory for data science*. Cambridge University Press. (Chapter 2)

Lesson N.	6
Lesson title	Predictive Analytics (1) - Linear Models for Financial Time Series
Duration	1h
Specific objectives	Provide students the knowledge about analysis of time series..
Topics	• Stationarity • Correlation and Autocorrelation Function • Linear Time Series • Simple Autoregressive Models
In presence activity	• Lectures • lecture discussion • exercise
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson
Other supporting material	Tsay, R. S. (2014). *An introduction to analysis of financial data with R*. John Wiley & Sons. (Chapter 1)

Lesson N.	7
Lesson title	Predictive Analytics (2) - Financial Time Series Analysis in R
Duration	1h
Specific objectives	Provide students the knowledge about financial time series and skills to use R for their analysis as well the visualization of financial time series.
Topics	• Examining Financial Time Series • Visualization of Financial Data
In presence activity	• Lectures • lecture discussion • programming demonstration • programming exercises

Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson
Other supporting material	Bennett, M. J., & Hugen, D. L. (2016). *Financial analytics with R: building a laptop laboratory for data science*. Cambridge University Press. (Chapter 2)

Lesson N.	8
Lesson title	Predictive Analytics (3) - Simple Forecasting in R
Duration	1h
Specific objectives	Provide students the knowledge about forecasting, simple forecasting models and skills to forecast using R.
Topics	• Moving Average Models • Exponential Smoothing • Seasonal Models
In presence activity	• Lectures • lecture discussion • programming demonstration • programming exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson • Assignments
Other supporting material	Tsay, R. S. (2014). *An introduction to analysis of financial data with R*. John Wiley & Sons. (Chapter 1) Ruppert, D., & Matteson, D. S. (2011).*Statistics and data analysis for financial engineering*. Springer. (Chapters 12, 13)

Lesson N.	9
Lesson title	Predictive Analytics (4) - Advanced Forecasting in R
Duration	1h
Specific objectives	Provide students the knowledge about advanced forecasting models and skills to forecast using R..
Topics	• Regression Models with Time Series Errors • Long-Memory Models
In presence activity	• Lectures • lecture discussion • programming demonstration • programming exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson • Self-evaluation test
Other supporting material	Tsay, R. S. (2014). *An introduction to analysis of financial data with R*. John Wiley & Sons. (Chapter 1) Ruppert, D., & Matteson, D. S. (2011).*Statistics and data analysis for financial engineering*. Springer. (Chapters 12, 13)

Lesson N.	10
Lesson title	Prescriptive Analytics (1) - Modelling
Duration	1h
Specific objectives	Provide students the knowledge optimization problems in finance and skills to build the mathematical models.
Topics	• Decision-making Problems in Finance • Mathematical Model Building • Examples of optimization problems in

	Finance
In presence activity	• Lectures • lecture discussion • exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson
Other supporting material	Cornuejols, G., Peña, J. & Tütüncü, R. (2018). *Optimization methods in finance*. Cambridge University Press (Chapter 1)

Lesson N.	11
Lesson title	Prescriptive Analytics (2) - Model Solving
Duration	1h
Specific objectives	Provide students the understanding of mathematical models types and solving corresponding methods.
Topics	• Linear Programming (LP) • Nonlinear Programming (NP) • Integer and Mixed Integer Programming (IP, MIP) • Dynamic Programming • Optimization with Data Uncertainty
In presence activity	• Lectures • lecture discussion
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson
Other supporting material	Cornuejols, G., Peña, J. & Tütüncü, R. (2018). *Optimization methods in finance*. Cambridge University Press (Chapter 1)

Lesson N.	12
Lesson title	Introduction to Python Language
Duration	1h
Specific objectives	Provide the students the core concepts and model of Value at Risk.
Topics	• The Python Programming Language Syntax • Software libraries and their usage in Python • Using optimization libraries
In presence activity	• Lectures • lecture discussion • programming demonstration • programming exercises • Problems solving • Case Study Exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Individual report • Audio/Video Lesson • Video example • Case Study • Self-evaluation test • Group assignments • Group presentation
Other supporting material	Hilpisch, Y. (2019). *Python for finance: mastering data-driven finance*. O'Reilly Media

Lesson N.	13
Lesson title	Prescriptive Analytics (3) - Solving LP Models in Python
Duration	1h

Specific objectives	Provide students the knowledge about linear programming models in finance and skills to solve real LP problems using Python.
Topics	• Optimal Short Term Financing (STF) Problem Modeling • Solving STF problem in Python
In presence activity	• Lectures • lecture discussion • programming demonstration • programming exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson • Self-evaluation test
Other supporting material	Cornuejols, G., Peña, J. & Tütüncü, R. (2018). *Optimization methods in finance*. Cambridge University Press (Chapter 3) Hilpisch, Y. (2019). *Python for finance: mastering data-driven finance*. O'Reilly Media Hart, W. E., Laird, C. D., Watson, J. P., Woodruff, D. L., Hackebeil, G. A., Nicholson, B. L., & Siirola, J. D. (2017). *Pyomo-optimization modeling in python* (Vol. 67). Berlin: Springer.

Lesson N.	14
Lesson title	Prescriptive Analytics (4) - Solving NP Models in Python
Duration	1h
Specific objectives	Provide students the knowledge about nonlinear programming models in finance and skills to solve real NP problems using Python.
Topics	• Portfolio Optimization Problem Modeling • Solving Portfolio Optimization Problem in Python

In presence activity	• Lectures • lecture discussion • programming demonstration • programming exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson
Other supporting material	Cornuejols, G., Peña, J. & Tütüncü, R. (2018). *Optimization methods in finance*. Cambridge University Press (Chapter 8) Hart, W. E., Laird, C. D., Watson, J. P., Woodruff, D. L., Hackebeil, G. A., Nicholson, B. L., & Siirola, J. D. (2017). *Pyomo-optimization modeling in python* (Vol. 67). Berlin: Springer.

Lesson N.	15
Lesson title	Prescriptive Analytics (5) - Solving IP Models in Python
Duration	1h
Specific objectives	Provide students the knowledge about integer and mixed-integer programming models in finance and skills to solve real NP problems using Python.
Topics	• Constructing an Index Fund (CIF) Problem Modeling • Solving CIF in Python
In presence activity	• Lectures • lecture discussion • programming demonstration • programming exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Case Study

Other supporting material	Cornuejols, G., Peña, J. & Tütüncü, R. (2018). *Optimization methods in finance*. Cambridge University Press (Chapter 12)) Hart, W. E., Laird, C. D., Watson, J. P., Woodruff, D. L., Hackebeil, G. A., Nicholson, B. L., & Siirola, J. D. (2017). *Pyomo-optimization modeling in python* (Vol. 67). Berlin: Springer.

Add tables for additional lessons if necessary

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- MODULE SYLLABUS -

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DELIVERABLE DESCRIPTION	
Deliverable number and name	MASTER IN FINTECH AND DIGITAL INNOVATION - MODULE SYLLABUS -
Due date	/
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Author	Cecilia A Mercado, Roberto M Arguelles (SLU)
Reviewers	/
Language	English
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Document history

Issue date	Version	Comments

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Table of Contents

1. Module details 4
2. Module description 4
3. Learning Outcomes 4
4. Module knowledge, skills and competencies (EQF*) 5
5. Module lessons 5

1. Module details

Module Title	MONEY, BANKING AND FINANCIAL INSTITUTIONS
Credits	3 units (Ph)
Hours	54 hours
N° of hours in presence	18 hours
N° of hours in distance learning	At least 36 hours
Name of the leading institution	Saint Louis University

2. Module description

This course explores the interaction between money, financial markets and institutions It will examine the 1) roles of money – using crypto and digital currencies, 2) the fundamental principles of asset pricing, 3) how financial institutions help to overcome financial frictions, 4) how monetary and macroprudential policy manage inflation and can help to mitigate financial crises, (5) the international financial architecture, especially the role of the International Monetary Fund, and the impact of FinTech on the financial sector.

3. Learning Outcomes

The course overall learning outcomes are:

By taking this course, students will:

1. strengthen the understanding of the fundamentals of the banking, financial and monetary systems;
2. develop strategies on how financial institutions help to overcome financial frictions and manage financial crisis and bank runs;
3. strengthen the understanding on how monetary and macroprudential policy manage inflation and help mitigate financial crises;
4. strengthen the understanding of the financial architecture and the role of International Monetary Fund and other international financial instituions; and

5. critically identify the impact of Fintech on the financial sector.

4. Module knowledge, skills and competencies (EQF*)

Moreover, at the end of this course, the student will be able to
(*https://europa.eu/europass/en/european-qualifications-framework-eqf) :

Knowledge and Understanding:

a. Demonstrate in-depth understanding of core concepts of banking and financial institutions
b. Demonstrate a critical understanding of money, banking and financial institutions model
c. Demonstrate a critical understanding of the range of digital solutions in monetary systems
d. Demonstrate a critical awareness of current, emerging and future issues for FinTech

Application and Problem-Solving Abilities:

a. Apply a significant range of financial models and other FinTech relevant skills;
b. Apply an integrated understanding of entrepreneurial dynamics, project and innovation management in the context of technology-based finance and banking
c. Plan and execute significant research and development projects of financial technology;

5. Module lessons

Lesson N.	1
Lesson title	Roles of money – using crypto and digital currencies
Duration	3 contact hours 6 hours distance learning
Specific objectives	Upon completion of the lesson: 1. the student will be to explain and understand the difference between money, credit and crypto 2. the students will be able to understand and apply the principles of interest, risks and bond market evaluation.

Topics	• Money, Credit and Crypto ○ Double coincidence of wants, Gresham's Law ○ Token vs. account-based money ○ "The Digitalization of Money" ○ Cryptocurrencies • Interest Rates, Risks and Bond Market Evaluations ○ Relative asset pricing, arbitrage ○ Yield curve, Forward rates, term structure, expectation hypothesis, … ○ Interest rate risk, default risk, variance risk and options, correlation risk and CDOs, CDS
In presence activity	-lecture video presentation, individual problem solving activities, interactive discussion
Distance learning type of learning object /task	• Audio/Video Lesson • Lecture note • Self-evaluation test
Other supporting material	

Lesson N.	2
Lesson title	The fundamental principles of asset pricing
Duration	3 contact hours 6 hours distance learning
Specific objectives	Upon completion of the lesson, the student will be able to 1. Define the describe risk free rate, risk premia and the macroeconomy 2. Apply the principles in solving problems
Topics	• Risk-free Rate, Risk Premia, and the Macroeconomy ○ Absolute asset pricing, stochastic discount factor ○ Leverage and capital structure

In presence activity	Theoretical video lecture, individual problem solving, interactive discussion
Distance learning type of learning object /task	• Audio/Video Lesson • Lecture note • Self-evaluation test
Other supporting material	

Lesson N.	3
Lesson title	Financial Institutions and Financial Frictions
Duration	3 contact hours
Specific objectives	Upon completion of the lesson, the student will be able to: 1. Describe bubbles and the efficient market hypothesis 2. Explain Financial Frictions and Inefficiencies

Topics	• Bubbles and the Efficient Market Hypothesis
	  ○ Gordon Growth Model, Efficient Market Hypothesis
	  ○ Bubbles
	• Financial Frictions and Inefficiencies
	  ○ Adverse selection, moral hazard, debt overhang, commitment problems, solvency vs. liquidity,
	  ○ - Mitigation via collateral, securitization, intermediaries, …

In presence activity	Class lecture (f2F)
Distance learning type of learning object /task	• Lecture note • Self-evaluation test
Other supporting material	

Lesson N.	4
Lesson title	Monetary and macroprudential policy management and Financial Crises
Duration	6 contact hours

	12 hours distance learning
Specific objectives	Upon completion of the lesson, the students will be able to: 1. Describe the principles of intermediation 2. Differentiate concepts on financial crises, systemic risk and financial regulation 3. Explain monetary and macroprudential policy

Topics	• Intermediation
	  ○ Trust and reputation
	  ○ Role of banks
	  ○ Traditional vs. Modern Banking and Shadow Banking
	  ○ Securitization
	  ○ FinTech
	• Financial Crises, Systemic Risk, Financial Regulation
	  ○ Amplification, multiple equilibria, liquidity spiral, endogenous risk, volatility paradox
	  ○ Liquidity vs. Solvency
	  ○ Bank Runs
	  ○ Systemic Risk Measures and Financial Regulation
	  ○ Great Recession
	  ○ Euro crisis
	• Monetary and Macroprudential Policy
	  ○ Mandates and goals of monetary policy, inflation targeting, Taylor rules
	  ○ Time inconsistency and reputation
	  ○ Accounting basics (Central banks, banks, and households' balance sheets) Boehm 146
	  ○ Transmission mechanism, time-inconsistency problem
	  ○ Central banks and bubbles
	  ○ Risky government debt, diabolic loop, stability and dominance concepts

In presence activity	Classroom Lecture F2F (6 hour, individual problem solving activities
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming

	conference • Lecture note • Self-evaluation test
Other supporting material	

Lesson N.	5
Lesson title	The international financial architecture
Duration	3 contact hours 6 hours distance learning
Specific objectives	Upon completion of the lesson, the students will be able to: 1. Elaborate the concepts and the role of International Financial Architecture 2. Describe Digitization of Money
Topics	• International Financial Architecture ○ Mundell Fleming Trilemma, pegs, dollarization, ○ Role of the IMF • Digitization of Money ○ Digital Currency Areas ○ Digital dollarization ○ The Digitization of Money
In presence activity	F2F class Lecture, group discussion of application
Distance learning type of learning object /task	• Video Lesson • Virtual classroomm • Lecture note • Self-evaluation test
Other supporting material	

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DELIVERABLE DESCRIPTION	
Deliverable number and name	MASTER IN FINTECH AND DIGITAL INNOVATION - MODULE SYLLABUS -
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Author	Glasgow Caledonian University (UK)
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Language	English
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Table of Contents

1. Module details 4
2. Module description 4
3. Learning Outcomes 5
4. Module knowledge, skills and competencies (EQF*) 5
5. Module lessons 6

1. Module details

Module Title	Innovation, Intrapreneurship and Entrepreneurship in FinTech Context
Credits	7.5
Hours	30
N° of hours in presence	10
N° of hours in distance learning	20
Name of the leading institution	Glasgow Caledonian University

2. Module description

This module emulates the process of developing a novel business proposition. As part of this the module students will analyse the FinTech innovation ecosystem (local and global trends and dynamics) and types of FinTech innovations in different settings (from commercial application to social enterprises and public private partnerships) and the differing entrepreneurial context (from start-up enterprises to intrapreneurial corporate strategic business units). Based on market research (competitor screening and consumer intelligence) students will engage in ideation through divergent thinking to formulate an initial FinTech Innovation that addresses market and consumer needs through crafting unique value propositions. An important aspect of the module is consideration of the societal impact of the business proposals and ethical business practices (informed by the UN Principles for Responsible Management Education – PRME – and Sustainable Development Goals - SDGs). The idea is further developed through considering distribution channels, revenue models/ streams including basic accounting and financial set-up and identify key success metrics. The module will continue to explore financing options and strategies including different sources of capital (e.g. seed funding, angel investors, accelerators, VC, etc) with students pitching their innovation proposals to stakeholder support. Lastly, the module will touch on applying credit risk management principles and practices to a FinTech start-up to optimise financial risk and return within acceptable parameters in decision making. This includes concepts of control and revenue management to reduce financial risks and increase return but also considers what skills and talent are required for this business proposal to be successful and sustainable.

3. Learning Outcomes

The module contributes to the following overall programme learning outcomes:

Knowledge and Understanding:

a. Demonstrates in-depth understanding of core concepts of banking and finance, incl. client and consumer valuation and needs (e.g. business valuation, but also market research);

e. Demonstrates a critical awareness of current, emerging and future issues for FinTech.

Application and Problem-Solving Abilities:

b. Applies an integrated understanding of entrepreneurial dynamics, project and innovation management in the context of technology-based finance and banking (e.g. development of innovative products/ solutions?) could be research projects);

c. Plans and executes significant research and development projects of financial technology;

d. Demonstrates originality and entrepreneurial thinking in developing innovative digital solutions for banking and finance.

4. Module knowledge, skills and competencies (EQF*)

Moreover, at the end of this course, the student will be able to (*https://europa.eu/europass/en/european-qualifications-framework-eqf) :

- Analyse the local and global FinTech innovation dynamics and trends, including existing finance and FinTech solutions, competitors and their offerings and consumers needs

- Synthesise information from different sources to formulate through divergent thinking a FinTech innovation that addresses a specific gap in the market

- Design the business model of a FinTech start-up or innovative project within existing company that addresses a relevant gap in the FinTech market using an appropriate approach

- Present a compelling business case including logic and strategy for capital requirements and how to raise it, processes to minimise financial risk to investors including resources (human, capital, technology and other) required for the start-up to be a success

5. Module lessons

Lesson N.	1
Lesson title	Introduction and overview of Innovation in FinTech
Duration	3h total
Specific objectives	
Topics	- Examples of FinTech Innovation - Examine success case studies and consider success factors - Examine failure case studies and consider reasons for failure - Consideration of ethics in FinTech
In presence activity	• 1h Introductory Workshop
Distance learning type of learning object /task	• 1h of recorded interviews/ testimonials about FinTech innovation and what made them success and failures • 1h of Collection of current FinTech Innovations – big or small – shared by students with perceived USPs and weaknesses
Other supporting material	

Lesson N.	2
Lesson title	Analyse local and global trends in FinTech
Duration	3h total
Specific objectives	
Topics	- Local trends in finance incl. FinTech opportunities - Global trends in finance incl. FinTech opportunities - UN PRME and SDGs drivers/ goals - social innovation, microfinance, etc.
In presence activity	• 1h Workshop introducing social innovation (incl. microfinance) as a source of "community/ social needs"
Distance learning type of learning object /task	• 1h of recorded lecture covering long term trend forecasting (e.g. Popcorn report) and generally sources of trend data; the conflict of location and globalisation of solutions (e.g. Yip) • 1h exercise of identifying a trend considering how global/ local it is and what the implications are for finance and the opportunity for FinTech.
Other supporting material	

Lesson N.	3.
Lesson title	Divergent thinking and ideation
Duration	3h total
Specific objectives	-Gain knowledge and understanding about the innovation processes -Practice team innovation using team innovation models -Apply critical reflection of business idea proposals for FinTech
Topics	Divergent thinking, Stages of innovation, innovative team models
In presence activity	The session can be delivered fully online or with 2 hours in presence activity. If delivered with in person, presential elements would be • 1h Lecture (could also be online) • 1h Team simulation (could also be online)
Distance learning type of learning object /task	If delivered fully online • 1h Online lecture synchronous- Virtual classroom/ web-streaming • 1h Online Team simulation , instructions for roles sent prior to simulation - Virtual classroom/ web-streaming • 1h exploratory reading and posting on discussion board
Other supporting material	https://pure.au.dk/portal/files/66/Formula_for_Innovation (released only after simulation)

Lesson N.	4
Lesson title	Value proposition
Duration	3h total
Specific objectives	
Topics	- Design Thinking – problem definition - Value Proposition canvas – connection idea to consumers
In presence activity	• 1h Workshop, Value Proposition Canvas incl. - pitching exercise based on online rich pictures
Distance learning type of learning object /task	• 1h Lecture on Design Thinking (see Van) and consumer needs (pains and gains) i.e. the problem definition • 1h activity on creating a rich picture of a financial process (incl. desired outcomes – gains and barriers – pains)
Other supporting material	https://www.strategyzer.com/blog/value-proposition-canvas-a-tool-to-understand-what-customers-really-want material is free for education http://systems.open.ac.uk/materials/T552/pages/rich/richAppendix.html just for guidance

Lesson N.	5
Lesson title	Intrapreneurship and organizational learning
Duration	3h total
Specific objectives	-Develop knowledge and understanding on the dynamics of intrapreneurship models -Discuss organizational learning as a form of innovation -Develop intrapreneurship proposals based on case studies
Topics	Differences between intrapreneurship and entrepreneurship, organizational learning dynamics, power and politics as aspects of internal innovation
In presence activity	The session can be delivered fully online or with 1 hours in presence activity. If delivered with in person, presential element would be 1h Lecture
Distance learning type of learning object /task	If delivered fully online • 1h Online lecture synchronous - Virtual classroom/web-streaming • 2h Online Case study - students split in groups and given case study to prepare an intrapreneurship. Can be done asynchronously or synchronously
Other supporting material	

Assessment 1: Individual assignment - 5 minute FinchTech business proposal pitch video

Lesson N.	6
Lesson title	Business Model I
Duration	3h total
Specific objectives	
Topics	- Business Model Canvas introduction - customer relations - channels - revenue streams
In presence activity	• 1h Workshop of students/groups presenting customer relations, channels and revenue streams to others
Distance learning type of learning object /task	• 1h Lecture introducing the Business Model Canvas and specifically customer relations, channels and revenue streams (Develop understanding on the value proposition models within the scope of risk and reward trade-off) • 1h Exercise to research and populate part of the Business Model Canvas
Other supporting material	https://www.strategyzer.com/canvas/business-model-canvas and associated material is free for education

Lesson N.	7
Lesson title	Business Model II
Duration	3h total
Specific objectives	
Topics	- value chain FinTech business - activities - resources - partners - cost structure - Performance measurement - Risk and opportunity in value chain components
In presence activity	• 1h Workshop of students/groups presenting activities, partners, cost structure
Distance learning type of learning object /task	• 1h Lecture introducing the Business Model Canvas and specifically activities, partners, costs structure • 1h Exercise to research and populate part of the Business Model Canvas
Other supporting material	https://www.strategyzer.com/canvas/business-model-canvas and associated material is free for education

Lesson N.	8
Lesson title	Resource requirements – human, capital, technology
Duration	3h total
Specific objectives	
Topics	- Resourcing: In-house versus out-sourcing - human resources/ skills - technological resources/ skills - other resources e.g. marketing, personnel, accounting
In presence activity	• 1h Workshop considering non-finance and non-technology skills needed for a business operation e.g. marketing, personnel, accounting
Distance learning type of learning object /task	• 1h recorded content on different capital sources and financing strategies (mix of academic summaries and industry/ finance testimonials) • 1h of mapping technological resource requirements and associated human skills; includes consideration of in-house skill and out-sourcing
Other supporting material	

Lesson N.	9
Lesson title	Ethics, Governance, Regulations and Operational Risk
Duration	3h total
Specific objectives	
Topics	- Identification of the sources of fraud in FinTech supply chain and mitigation strategies - Governance and regulatory issues in FinTech business - Operational and Conduct risk
In presence activity	• 1h Workshop considering operational/ fraud risk and good governance – picking up on the online regulation-risk exercise
Distance learning type of learning object /task	• 1h recorded lectures/ industry testimonials about different aspects of ethics and governance • 1h exercise to review a set of regulations and share (in live seminar or discussion board) how they are relevant to the FinTech Innovation and risk associated with them.
Other supporting material	

Lesson N.	10
Lesson title	Start-up Sustainability and Founder Exit Strategies
Duration	3h total
Specific objectives	
Topics	- Business long-term sustainability - Risk and sustainable investment in FinTech business - Risk mitigation and exit strategies - Decision making in presence of risk and uncertainty
In presence activity	• 1h Closing lecture summarizing key points of entrepreneurial thinking, innovation management for sustainability and planning for exit strategy
Distance learning type of learning object /task	• 1h recorded content about importance of sustainability and founder exit-strategy considerations • 1h exercise of drafting plans for innovation sustainabilty (how will the business be able to protect/ continue developing new innovations) and founder exit strategies
Other supporting material	

Assessment 2: Group assignment – Assigned groups (suggested size 4 students) work on a business proposal idea (start-up on intrapreneurship). Written up business proposal 3000 words.

Financial Technology and digital innovation to modeRnise and develop cUrricula of VietnameSe and Philippines UniversiTies

Project № 610256-EPP-1-2019-1-IT-EPPKA2-CBHE-JP

MASTER IN FINTECH AND DIGITAL INNOVATION

- MODULE SYLLABUS -

Co-funded by the Erasmus+ Programme of the European Union

DELIVERABLE DESCRIPTION	
Deliverable number and name	MASTER IN FINTECH AND DIGITAL INNOVATION - MODULE SYLLABUS -
Due date	/
Work Package	WP2
Author	Gianfranco Vento (Università degli Studi Guglielmo Marconi)
Reviewers	/
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Issue date	Version	Comments

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Table of Contents

1. Module details 4
2. Module description 4
3. Learning Outcomes 4
4. Module knowledge, skills and competencies (EQF*) 5
5. Module lessons 6

1. Module details

Module Title	DIGITAL AND OPEN BANKING
Credits	
Hours	45h
N° of hours in presence	15h
N° of hours in distance learning	*At least 15*
Name of the leading institution	USGM

2. Module description

This module aims at developing students' understanding of banking industry evolution at global level. The module investigates how digital transformation is modifying banking industry worldwide.

More specifically, the module deepens some of the key functions of modern banks – with a special focus on commercial banking – and analyse how technological revolution is modifying key products and services offered by banks, how distribution channels are affected and how banks' business model is changing.

Furthermore, the interaction among banks and other providers of financial services is explored. In addition to that, the module covers how the global regulatory framework is reacting as a consequence of technological revolution as well as the impact of the above-mentioned changes on risk management, compliance and AML approaches.

Last, this module covers the impact of digital and open banking on the financial industries and the economic systems of emerging countries.

3. Learning Outcomes

The course overall learning outcomes are:

Knowledge and Understanding:

a. The course will strengthen the theoretical and methodological foundations of digital

and open banking for careful analyses and evaluations of the perspectives of banking industry, in a globalized context. It will offer also practical tools to manage real opportunities and problems, with relevant financial impacts, in the field of global banking, payment industry and investments.

b. Students are expected to demonstrate an in-depth understanding of core concepts of digital and open banking (products and services, distribution channels, costs, business models, impact on emerging economies).
c. Students are expected to acquire the ability to collect and interpret real financial data in order to deal with banking decisions, risk analysis, financial regulatory issues, and to discuss the impact of these technological changes on emerging economies.
d. The course will lead students to solve and manage real business cases at banking levels.

Application and Problem-Solving Abilities:
Students will be able:

a. to assess the role of the financial manager and the impact of his decisions on banks value creation process;
b. to apply investment decision-making techniques, within different scenarios and uncertainty;
c. to apply the main analytical tools, functions and online resources for business and financial modeling
d. to apply an integrated understanding of markets and firms dynamics, in the context of technology-based finance
e. to plan and execute significant research and development projects of financial management.

4. Module knowledge, skills and competencies (EQF*)

Students will acquire the knowledge and analysis tools that will allow them to deal with financial problems in a complex and dynamic context. Students will acquire the practical knowledge to act as Chief Financial Officer in domestic or multination firms. They will be able to develop discernment skills of the various problems relating to investments and the acquisition of financial resources by companies following strictly financial logics. Moreover, at the end of this course, the student will be able to (*https://europa.eu/europass/en/european-qualifications-framework-eqf) :

- Memorize and describe theories and tools of Advanced Corporate Finance;
- Identify the main problems and questions of global financial management;
- Apply methods and models of Financial Theory in the corporate problem-solving and decision-making processes;
- Classify, analyze, interpret, and predict the behaviour of the main financial variables of an international context;
- Design future competitive scenarios and hypothesize financial strategies and policies for

domestic and multinational companies;
- Evaluate convenience and profitability of investment, financial and risk policies, estimating their impact on the firm value.

Communications Skills

The enhancement of written and oral communication skills will be encouraged by participation in business cases' analysis during the course. The communication skills will in particular be oriented to the critical analysis and solution of financial management problems within the company in different economic and business contexts, as well as to the development of active and critical comparisons with respect to the business issues addressed.

5. Module lessons

Lesson N.	1
Lesson title	Introduction to Digital and Open Banking
Duration	1h
Specific objectives	The lesson illustrates the most relevant technological changes which are affecting banking industry worldwide as well as the main consequences on traditional banks.
Topics	FinTech, commercial banking, retail banking.
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Lecture note • Self-evaluation test
Other supporting material	Data on banking industry evolution.

Lesson N.	2
Lesson title	How FinTech is affecting the payment industry
Duration	1h

Specific objectives	The lesson deepens how new technologies and different intermediaries are affecting banks' position within payment industry. Practical cases are presented.
Topics	Payment industry, payment facilities, impacts on banks.
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test
Other supporting material	

Lesson N.	3
Lesson title	How FinTech is affecting asset management industry
Duration	1h
Specific objectives	The lesson investigates how FinTech is affecting asset management industry, in a global perspective, as well as the performance of asset management industry and the business models adopted by banks.
Topics	Asset management, analysis of new technologies for asset management (i.e., robo advisoring)
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test

Other supporting material	

Lesson N.	4
Lesson title	How FinTech is Affecting Lending Function
Duration	1h
Specific objectives	This lecture investigates how FinTech is affecting lending strategies and business models. Practical cases.
Topics	Lending business, artificial intelligence, changes in business models.
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test
Other supporting material	

Lesson N.	5
Lesson title	FinTech and Risk Management
Duration	1h
Specific objectives	This lecture covers how FinTech is affecting risk management function (i.e., how different risks are affected by technology).
Topics	
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test

Other supporting material	

Lesson N.	6
Lesson title	Fin Tech, Regulation and Supervision
Duration	1h
Specific objectives	This lecture analyses how regulation is changing in order to allow technology to become part of banking business.
Topics	
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test
Other supporting material	

Lesson N.	7
Lesson title	New technologies and banks' costs.
Duration	1h
Specific objectives	This lecture investigates how new technologies are modifying banks' costs. It covers costs of technology, human resources and the interaction with choices on the distribution channels.
Topics	
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test

Other supporting material	

Lesson N.	8
Lesson title	FinTech & Banks' business models
Duration	1h
Specific objectives	This lecture investigates how banks' business models are more and more affected by the technological revolution.
Topics	
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test
Other supporting material	

Lesson N.	9
Lesson title	A Case Study of a FinTech Company
Duration	1h
Specific objectives	This seminar will be prepared by the CEO of a FinTech company which offers payment facilities.
Topics	
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Seminar note • Self-evaluation test
Other supporting material	

Lesson N.	10
Lesson title	Digital Banking: Where the Market is Going
Duration	1h
Specific objectives	
Topics	This lecture analyses the most relevant trends in digital banking industy, in a global perspective.
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test
Other supporting material	

Lesson N.	11
Lesson title	Digital Banking in Emerging Economies
Duration	1h
Specific objectives	
Topics	This lecture analyses how digital banking is affecting the financial system, the economy and the society in emerging economies.
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test
Other supporting material	

Financial Technology and digital innovation to modeRnise and develop cUrricula of VietnameSe and Philippines UniversiTies

Project № 610256-EPP-1-2019-1-IT-EPPKA2-CBHE-JP

MASTER IN FINTECH AND DIGITAL INNOVATION

- MODULE SYLLABUS -

Co-funded by the Erasmus+ Programme of the European Union

DELIVERABLE DESCRIPTION	
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Work Package	WP2
Author	Mapua University (PH)
Reviewers	/
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Version	N. 1

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Issue date	Version	Comments

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Table of Contents

1. **Module details** **4**
2. **Module description** **4**
3. **Learning Outcomes** **4**
4. **Module knowledge, skills and competencies (EQF*)** **5**
5. **Module lessons** **6**

1. Module details

Module Title	FINANCE, ARTIFICIAL INTELLIGENT AND MACHINE LEARNING
Credits	3 credit units
Hours	54
N° of hours in presence	
N° of hours in distance learning	
Name of the leading institution	Mapua University

2. Module description

The course aims to combine three main building blocks: foundations of econometrics, statistics and probabilistic theory and basics of machine learning in finance. During the course, students will deal with the basic principles of econometric analysis such as random variables, univariate and multivariate discrete and continuous distributions, expectations and moments, hypothesis testing, estimation and properties of estimators, and time series. It will then explain the basics of finance, starting with key definitions and finishing with: no-arbitrage conditions, bond pricing, and derivatives to the standard models such as CAPM and CCAPM. The third and final part of the module will deal with probability theory and stochastic calculus. Topics will include measures theory, diffusions, Markov processes and martingales, introduction to stochastic integration, and stochastic differential equations. The module aims to build a basic knowledge of machine learning in order to critically address and use standard financial methods and terminologies of financial markets and financial modelling.

3. Learning Outcomes

The course overall learning outcomes are:

Knowledge and Understanding:

a. Demonstrates in-depth understanding of core concepts of banking and finance, including client and consumer valuation and needs, financial and environmental trends

(e.g. business valuation, but also market trends and quantitative research);

b. Demonstrates a critical understanding of technology-based banking concepts (e.g. digital banking, open banking, etc.);
c. Demonstrates a critical understanding of the range of digital solutions in monetary systems (e.g. digital finance, InsurTech, etc.);
d. Demonstrates understanding and awareness of emerging technological enablers in banking and finance (e.g. digitalisation, automation, machine learning, AI, etc.);
e. Demonstrates a critical awareness of current, emerging and future issues for FinTech.

Application and Problem-Solving Abilities:

a. Applies a significant range of specialist database and software operating, programming and other FinTech relevant skills;
b. Applies an integrated understanding of entrepreneurial dynamics, project and innovation management in the context of technology-based finance and banking (e.g. development of innovative products/ solutions?) could be research projects);
c. Plans and executes significant research and development projects of financial technology;
d. Demonstrates originality and entrepreneurial thinking in developing digital

4. Module knowledge, skills and competencies (EQF*)

Moreover, at the end of this course, the student will be able to:

- Apply methods and models of Financial Theory in the corporate problem-solving and decision-making processes;
- Correlate the usage of specific financial applications to digital and technology-based practices.
- Identify the main problems and questions of financial management using methods and models of financial Theories in coming up strategic solutions and tactics to technology-based problems
- Classify, analyze, interpret, and predict the behavior of the main financial variables of an international context in application to upcoming technology usage
- Design future competitive scenarios and hypothesize financial strategies and policies for domestic and multinational companies;
- Evaluate convenience and profitability of corporate financial and investment policies, estimating their impact on the firm value

5. Module lessons

Lesson N.	1
Lesson title	Foundation of Econometrics
Duration	
Specific objectives	Should be able to learn financial econometrics in finance
Topics	- Introduction to financial management - Financial econometrics - Econometric techniques in practice
In presence activity	
Distance learning type of learning object /task	● Audio/Video Lesson ● Virtual classroom/ web-streaming conference ● Lecture note ● Case Study ● Self-evaluation test
Other supporting material	Assigned reference materials and research links

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Lesson N.	2
Lesson title	Statistics and Probabilistic Theory
Duration	
Specific objectives	Should be able to interpret and analyze statistical data using quantitative research methods
Topics	- An introduction to linear regression - Interpreting and comparing regression models - Heteroskedasticity and autocorrelation
In presence activity	

Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test
Other supporting material	Assigned reference materials and research links

Lesson N.	3
Lesson title	Machine Learning Fundamentals
Duration	
Specific objectives	Should be able to learn and explore downloading and mining real web data sets and other machine learning tools
Topics	-Introduction and Basic Concepts -Large Scale Machine Learning -Anomaly Detection and Recommender Systems -Evaluation Metrics
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test
Other supporting material	Assigned reference materials and research links

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Project № 610256-EPP-1-2019-1-IT-EPPKA2-CBHE-JP

MASTER IN FINTECH AND DIGITAL INNOVATION

- MODULE SYLLABUS -

Co-funded by the Erasmus+ Programme of the European Union

DELIVERABLE DESCRIPTION	
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Due date	/
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Author	Nguyen Duy Viet, Do Nguyen Nguyet Minh (VNU)
Reviewers	/
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Table of Contents

1. Module details 4
2. Module description 4
3. Learning Outcomes 5
4. Module knowledge, skills and competencies (EQF*) 5
5. Module lessons 6

1. Module details

Module Title	MONETARY SYSTEM AND DIGITAL FINANCIAL
Credits	
Hours	45h
N° of hours in presence	15h
N° of hours in distance learning	*At least 15*
Name of the leading institution	VNU

2. Module description

Upon successful completion of the course, the student is expected to be able to demonstrate strong knowledge on fintech applications; the history & usage of cryptocurrencies; and both these technology domains' main market incentives and socioeconomic drivers – gathering a solid understanding of the opportunities in the ongoing revolution we are living in.

This course is designed to help students understand the connections between money (the State Bank of Vietnam), financial markets, and the macroeconomy. How are interest rates determined, and how does the State Bank of Vietnam conduct monetary policy? What economic factors drive the yield curves in different bond markets? We will pay particular attention to the banking system, with an eye toward understanding the function and importance of banks. Topics will include the role of the State Bank of Vietnam as a lender of last resort during the recent, and prior, financial crises, unconventional monetary policy tools such as quantitative easing and forward guidance. We discuss new developments in payment and clearing including cryptocurrencies. We will often begin class with a discussion of current macro-financial market events in the context of our course coverage. The course is appropriate for anyone trying to gain a macroeconomic perspective on capital markets, from investors to bankers, or those simply interested in the linkages between interest rates, banks and the economy.

3. Learning Outcomes

This is a non-technical, non-jargon heavy course. We will focus on macro level impacts & everyday applications of fintech and cryptocurrencies. You will be able to clearly demonstrate to your friends, family and employers the basics of WeChat (China), Revolut (the UK), mPesa (Kenya), Gojek (Indonesia), Coinbase (the US), Bitcoin, Ethereum and many other key actors in the financial technology space. Not only that, you will have a much deeper understanding of why gold is valuable, why STATE BANK OF VIETNAM resorts to QE in times of crisis, how to protect yourself from inflation and who to follow in the world to be ahead of the curve. I will also invite leading industry experts from the space to contribute to our classes as live guest speakers – hence you will have a unique chance to enlarge your network through Q&A sessions and potential follow-ups.

4. Module knowledge, skills and competencies (EQF*)

No prior knowledge required. All disciplines welcome.

There are basically three requirements that should be fulfilled successfully by the students in order to pass the course:

- First requirement is to participate in class discussions/debates regarding course material. Your opinion matters, as both industries are new and open to debate.(30%)
- Second requirement is make a midterm project on fintech applications, as a brief 10-minute-long presentation. What is a useful application of QR codes or digital payments? Creativity wins. Please check ECON 342 Google Drive knowledge base for ideas. (40%)
- Third requirement is to make a final project on crypto applications & a brief 10-minute- long presentation. Create your own way of thinking about things, what does Bitcoin or Ethereum mean to you – are they speculative assets or global payment infrastructures? Be ambitious and think of a way to make use of all you learned. (40%)

Communications Skills

The enhancement of written and oral communication skills will be encouraged by participation in money system and digital finance cases' analysis during the course. The communication skills will in particular be oriented to the critical analysis and solution of digital financial management problems within the company in different economic and business contexts, as well as to the development of active and critical comparisons with respect to the business issues addressed.

5. Module lessons

First part: Interest Rates

Lesson N.	1
Lesson title	Interest Rates and Expectations Hypothesis
Duration	1h
Specific objectives	The lesson has the objective to lead the students to understand Term Structure of Interest Rates, The Expectations Hypothesis.
Topics	Term Structure of Interest Rates, The Expectations Hypothesis
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson
Other supporting material	

Lesson N.	2
Lesson title	Interest Rates and Loanable Funds
Duration	1h
Specific objectives	The lesson has the objective to lead the students to have basic knowledge about the Behavior of Interest Rates: Loanable Funds Framework
Topics	The Behavior of Interest Rates: Loanable Funds Framework
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson
Other supporting material	

Lesson N.	3
Lesson title	Long-term Interest Rates and Inflation Expectations
Duration	1h
Specific objectives	The lesson has the objective to lead the students to understand Term premia, Treasury Inflation Protected Securities, Real Interest Rates
Topics	Real interest rate, inflation, nominated interest rate
In presence activity	
Distance learning type of learning object /task	Audio/Video Lesson
Other supporting material	

Second part: State Bank of Vietnam Funds

Lesson N.	4
Lesson title	State Bank of Vietnam Funds: Reserve Requirements and Reserve Management
Duration	1h
Specific objectives	The lesson has the objective to introduce students to the Reserve Requirements and Reserve Management of State Bank of Vietnam and determination of the State Bank of Vietnam Funds Rate
Topics	
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson
Other supporting material	

Lesson N.	5
Lesson title	State Bank of Vietnam: Policy Tools
Duration	1h
Specific objectives	The lesson has the objective to introduce students to the policy tools that State Bank of Vietnam uses including: The Discount Window, Open Market Operations
Topics	The Discount Window, Open Market Operations
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Lecture note
Other supporting material	

Lesson N.	6
Lesson title	State Bank of Vietnam: Transmission
Duration	1h
Specific objectives	
Topics	Monetary Transmission Mechanism, Inflation and Unemployment
In presence activity	Prepare and hand in write-up for Monetary Policy case. Readings: The Credit Crunch, by Ben Bernanke and Cara Lown: http://www.jstor.org/stable/pdfplus/2534592.pdf
Distance learning type of learning object /task	• Audio/Video Lesson • Lecture note
Other supporting material	

Third part: Fintech

Lesson N.	7
Lesson title	What is FinTech?
Duration	1h
Specific objectives	
Topics	Fintech introduction, FinTech Transformation
In presence activity	
Distance learning type of learning object /task	• Lecture note • Video lesson
Other supporting material	

Lesson N.	8
Lesson title	FinTech Evolution
Duration	1h
Specific objectives	
Topics	FinTech Evolution 1.0: Infrastructure FinTech Evolution 2.0: Banks FinTech Evolution 3.0 & 3.5: Startups and Emerging Markets
In presence activity	
Distance learning type of learning object /task	• Video lesson • Lecture note
Other supporting material	

Lesson N.	9
Lesson title	Industry Showcase: Collaboration between Financial Institutions and Startups (The FinTech Association of Vietnam)
Duration	1h
Specific objectives	

Topics	
In presence activity	
Distance learning type of learning object /task	• Lecture note • Self-evaluation test
Other supporting material	

Lesson N.	10
Lesson title	FinTech Typology, Fintech emerges Economics
Duration	1h
Specific objectives	
Topics	FinTech Typology, Emerging Economics: Opportunities and Challenges
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test
Other supporting material	

Lesson N.	11
Lesson title	Industry Showcase
Duration	1h
Specific objectives	
Topics	The Future of RegTech and 6 Technologies Impacting It (Thomson Reuters)
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Lecture note
Other supporting material	

Forth part: Digital Finance and Alternative Finance

Lesson N.	12
Lesson title	A Brief History of Financial Innovation
Duration	1h
Specific objectives	
Topics	History of Financial Innovation; Digitization of Financial Services; FinTech & Funds
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson
Other supporting material	

Lesson N.	13
Lesson title	Crowdfunding, P2P
Duration	1h
Specific objectives	
Topics	Crowdfunding – Regards, Charity and Equity P2P and Marketplace Lending The Rise of Vietnam TechFins – New Models and New Products
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test
Other supporting material	

Fifth part: **FinTech Regulation and RegTech**

Lesson N.	14
Lesson title	FinTech Regulations
Duration	1h
Specific objectives	
Topics	
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test
Other supporting material	

Lesson N.	15
Lesson title	The Future of Data-Driven Finance
Duration	1h
Specific objectives	
Topics	Case Study: Revolut (UK)
In presence activity	
Distance learning type of learning object /task	• Lecture note • Self-evaluation test
Other supporting material	

Financial Technology and digital innovation to modeRnise and develop cUrricula of VietnameSe and Philippines UniversiTies

Project № 610256-EPP-1-2019-1-IT-EPPKA2-CBHE-JP

MASTER IN FINTECH AND DIGITAL INNOVATION

- MODULE SYLLABUS -

Co-funded by the Erasmus+ Programme of the European Union

DELIVERABLE DESCRIPTION	
Deliverable number and name	MASTER IN FINTECH AND DIGITAL INNOVATION - MODULE SYLLABUS -
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Author	Ho Chi Minh Open University (VN)
Reviewers	/
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Issue date	Version	Comments

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Table of Contents

1. Module details 4
2. Module description 4
3. Learning Outcomes 4
4. Module knowledge, skills and competencies (EQF*) 5
5. Module lessons 5

1. Module details

Module Title	BLOCKCHAIN AND APPLICATIONS
Credits	3 Vietnamese Credit Unit (5 ECTS approximately)
Hours	150
N° of hours in presence	37.5
N° of hours in distance learning	At least 15
Name of the leading institution	Ho Chi Minh City Open University

2. Module description

As an emerging technology platform, blockchain is wisely employed in events/transactions/data generated with the resistance and verifiability manners to the public. Through this module, you will gain an understanding of the core value proposition of blockchain technology and how its etymology drives the new zeitgeist.

You will also learn the canonical technology (Bitcoin & Ethereum), their challenges along with current thinking about how to overcome them, while also gaining insight on raising capital from and valuing the token-based economy.

3. Learning Outcomes

The course overall learning outcomes are:

Knowledge and Understanding:

a. Demonstrates a critical understanding of technology-based banking concepts (e.g. digital banking, open banking, etc.);
b. Demonstrates a critical understanding of the range of digital solutions in monetary systems (e.g. digital finance, InsurTech, etc.);
c. Demonstrates understanding and awareness of emerging technological enablers in banking and finance;
d. Demonstrates a critical awareness of current, emerging and future issues for FinTech.

Application and Problem-Solving Abilities:

a. Applies a significant range of specialist database and software operating, programming and other FinTech relevant skills;
b. Applies an integrated understanding of entrepreneurial dynamics, project and innovation management in the context of technology-based finance and banking (e.g.

4. Module knowledge, skills and competencies (EQF*)

development of innovative products/ solutions?) could be research projects);
Moreover, at the end of this course, the student will be able to

- *Understand the Blockchain technology and its applications.*
- *Present Blockchain concepts clearly and persuasively.*
- *Explain the crypto token in a professional manner and pursue it in their professional purpose.*

5. Module lessons

Lesson N.	1
Lesson title	Blockchain technology- an introduction
Duration	28 hours (7 contact hours approximately)
Specific objectives	+ Understand the ideas behind the blockchain. + Explain cryptographic concepts.
Topics	+ Decentralised ladger system + Blockchain: definition and a solution for a decentralized system. + Cryptographic concepts.
In presence activity	Instructor explains the historical ideas of blockchain technology. Students discuss the use of blockchain in the banking -finance sector. Students debate the barriers and opportunities of using blockchain.

Distance learning type of learning object /task	● A short video on blockchain ● Virtual classroom/ web-streaming conference ● Lecture note ● Self-evaluation test
Other supporting material	Mark Gates (2017). Blockchain: Ultimate guide to understanding blockchain, bitcoin, cryptocurrencies, smart contracts and the future of money. Wise Fox Publishing. Chapter 1, 2, 3, 4, and 5. Mohiuddin Ahmed (2020). Blockchain in data analytics. Cambridge Scholars Publishing. ISBN (13): 978-1-5275-4429-1. Chapter 1, 2 ,3 and 4. Niaz Chowdhury (2020). Inside Blockchain, Bitcoin and Cryptocurrencies. Taylor & Francis Group ISBN: 978-1-138-61815-2; Chapter 1, 2 (2.1 and 2.2 page 27-40).

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Lesson N.	2
Lesson title	Blockchain platform
Duration	60 hours (15 contact hours approximately)
Specific objectives	+ Understand the classification of blockchain. + Explain the cryptocurrency. + Distinguish the specifications of blockchain.
Topics	+ Blockchain philosophy. + Blockchain platforms. + Cryptocurrency (Ethereum and bitcoin).
In presence activity	+ Instructor explains and supervises students to discuss the concepts/definitions of blockchain platforms and the cryptocurrency.

	+ Students prepare a presentation to introduce bitcoin (history, distributed P2P network, immutable ledger, forks and the role of money). + Students work in groups to discuss: Ethereum's role in the Fintech ecosystem; and tokenizing share and Fund Raising.
Distance learning type of learning object /task	● Audio/Video Lesson ● Lecture note ● Group assignments
Other supporting material	Tiana Laurence (2017) Blockchain for dummies. John Wiley & Son Inc. ISBN 978-1-119-36560-0. Chapter 2, 3, 4 and 5. Niaz Chowdhury (2020). Inside Blockchain, Bitcoin and Cryptocurrencies. Taylor & Francis Group ISBN: 978-1-138-61815-2; Chapter 2 (2.3, 2.4, 2.5 and 2.6 page36 -48), chapter 3, 4, 6, 12, 13, 14, 15, 16 Mark Gates (2017). Blockchain: Ultimate guide to understanding blockchain, bitcoin, cryptocurrencies, smart contracts and the future of money. Wise Fox Publishing (Chapter 8).

Lesson N.	3
Lesson title	Blockchain applications
Duration	62 hours (15,5 contact hours approximately)
Specific objectives	+ Classify the criteria for Blockchain application + Apply the blockchain for firm activities. + Verify the limitation, challenges and opportunities of blockchain + Understand the requirements for the regulation for blockchain.

Topics	+ Criteria for blockchain application. + Blockchain and firms. + Cases with Blockchain + Risk and limitation of blockchain. + Challenges and Opportunities of blockchain. + Legal issues and regulation for blockchain.
In presence activity	+ Instructor explains the criteria to blockchain application. Besides that instructor provides topics, cases and supervises students to discuss. + Students discuss cases and risks/issues of blockchain.
Distance learning type of learning object /task	● Audio/Video Lesson ● Virtual classroom/ web-streaming conference ● Lecture note ● Group assignments/presentations.
Other supporting material	Mohiuddin Ahmed (2020). Blockchain in data analytics. Cambridge Scholars Publishing. ISBN (13): 978-1-5275-4429-1. Chapter 5, 6,7, 9 Niaz Chowdhury (2020). Inside Blockchain, Bitcoin and Cryptocurrencies. Taylor & Francis Group ISBN: 978-1-138-61815-2; Chapter 8, 9, 10, 11 Mark Gates (2017). Blockchain: Ultimate guide to understanding blockchain, bitcoin, cryptocurrencies, smart contracts and the future of money. Wise Fox Publishing. Chapter 6, 7, 8 and 10.

Financial Technology and digital innovation to modeRnise and develop cUrricula of VietnameSe and Philippines UniversiTies

Project № 610256-EPP-1-2019-1-IT-EPPKA2-CBHE-JP

MASTER IN FINTECH AND DIGITAL INNOVATION

- MODULE SYLLABUS -

Co-funded by the Erasmus+ Programme of the European Union

DELIVERABLE DESCRIPTION	
Deliverable number and name	MASTER IN FINTECH AND DIGITAL INNOVATION - MODULE SYLLABUS -
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Disclaimer

Table of Contents

1. **Module details** **4**
2. **Module description** **4**
3. **Learning Outcomes** **5**
4. **Module knowledge, skills and competencies (EQF*)** **5**
5. **Module lessons** **6**

1. Module details

Module Title	Asset Pricing and Portfolio Management
Credits	3
Hours	Number of hours module evaluation-4
N° of hours in presence	25
N° of hours in distance learning	25
Types and n° hours of summative evaluation	Topical quickcheck questions (open-ended and multiple choice) Self-evaluation test (open-ended and multiple choice) Group drills and project works Number of hours in presence summative evaluation 2 Number of hours online summative evaluation 2
Name of the leading institution	University of Cebu

2. Module description

The module will cover most of the standard theoretical tools in asset pricing, e.g., stochastic discount factor, no-arbitrage, factor pricing models, complete markets, equilibrium asset pricing, beta pricing models, risk neutral valuations, contingent claims, mean variance analysis, intertemporal asset pricing, conditional asset pricing, and modern portfolio theory. It will also present a unified approach treatment of popular empirical methods, including time-series and cross-sectional regressions, in addition to methods based on generalised method of moments (GMM) and maximum likelihood.

This module provides you with a critical understanding of techniques used for investments and portfolio management. The teaching is accompanied by case studies and realistic practical examples that you will solve each week using

programming software such as R. By the end of the module you will be able to implement trading strategies and portfolio construction methods in a wide range of assets. This module will to introduce you to corporate responsibility and professional standards for financial analysts. You will be taken through a review of the key factors and responsibilities for ethical practice in finance.

3. Learning Outcomes

The course overall learning outcomes are:

Knowledge and Understanding:

a. Demonstrates in-depth understanding of core concepts of investment and portfolio management
b. Demonstrates a critical understanding of investment concepts both from individual and institutional perspectives
c. Demonstrates a critical understanding of the range of investment avenues available within the financial market system.
d. Demonstrates in depth understanding and awareness of market implications from firm, industry and macroeconomic environment
e. Convincingly establish the link between modern investing approaches and the available tools of the current, emerging and future issues more especially in FinTech.

Application and Problem-Solving Abilities:

a. Practice at least few ranges of investment activities within the financial market system;
b. Do actual investment decisions using available FinTech tools and other technologically enabling financial softwares solutions;
c. Applies an integrated understanding of entrepreneurial dynamics, project and innovation management in the context of financial market;
d. Plans and executes significant research and development projects of financial system and technology;
e. Demonstrates innovations and entrepreneurial thinking in terms of interaction with the financial system.

4. Module knowledge, skills and competencies (EQF*)

Moreover, at the end of this course, the student will be able to (*https://europa.eu/europass/en/european-qualifications-framework-eqf) :
https://pqf.gov.ph/Home/Details/4

- Enumerate and discuss the different major topics and subtopics in asset pricing and portfolio management ;
- Exploit different tools available in the areas of investment and portfolio management; Identify the main problems and questions of financial management;
- Apply solutions, methods and models of financial theory in the corporate problem-solving and decision-making processes;
- Classify, analyze, interpret, and predict the behaviour of the main financial variables both from domestic and international market
- Design future competitive scenarios and hypothesize financial strategies and policies for domestic and multinational companies;
- Evaluate convenience and profitability of corporate financial and investment policies estimating their impact on the firm value.

5. Module lessons

Lesson N.	1
Lesson title	Investment groups
Duration	2 hours
Specific objectives	● Explain the basic functions of different investment institutions available from the point of view of investors ● Enumerate the differences of the different risks and return scenario of different investment groups ● Discuss the taxes incentive and disincentive as well as other regulatory implication of different investment groups
Topics	● Banks ● Foundations and endowments ● Insurance companies ● Mutual funds ● Pension funds ● Individual private investors ● Institutional investors
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion

Distance learning type of learning object /task	• Audio/Video Lessons and duration: 3 video lessons of about 20 minutes each one • Virtual classrooms/ web-streaming conference and duration: 1 Virtual classrooms/ web-streaming of about 1 hour • Lecture note: yes • Case Study: no
Other supporting material	Reference article: Yes Video Documentary : Yes
Formative evaluation	• Topical quickcheck questions (open-ended and multiple choice)

Lesson N.	2
Lesson title	Asset Allocation and Investing
Duration	2 hours and 20 minutes
Specific objectives	• Be able to explain what is involved in the asset allocation process • Enumerate and explain what are the four steps in the portfolio management • Be able to know what is the role of asset allocation in investment planning • Explain why is a policy statement important to the planning process • Discuss what objectives and constraints should be detailed in a policy statement • Explain how and why do investment goals change over a person's lifetime • Understand why do asset allocation strategies differ across national boundaries • Measuring Historical Rates of Return on Investment • Computing Mean Historical Return on Investment • Calculating Expected Rates of Return on Investment • Measuring the Risk of Expected Rates of Return on Investment • Determinants of Required Returns on Investment

Topics	• Asset allocation process • Steps in the portfolio management • Asset allocation and investment planning • Asset allocation policy and its importance • Changes in investment goals • Asset allocation in international scene • Risk and return on investment >Historical >Mean >Calculation >Measurement >Determinants
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	Audio/Video Lessons and duration: 4 video lessons of about 20 minutes each one Virtual classrooms/ web-streaming conference and duration: 1 Virtual classrooms/ web-streaming of about 1 hour Lecture note: yes Case Study: no
Other supporting material	Online video reference: Yes
Formative evaluation	Topical quickcheck questions (open-ended and multiple choice)

Lesson N.	3
Lesson title	Portfolio and arbitrage pricing theory
Duration	2 hours
Specific objectives	
Topics	• Portfolio mean and variance • Diversification • Portfolio frontier with 2 assets • Portfolio frontier with more than 2 assets (Markowitz problem)

	• The 2-fund theorem (with no risk-free asset) • The 1-fund theorem (with risk-free asset) • Factor models • No arbitrage conditions • APT • APT and CAPM
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	Audio/Video Lessons and duration: 3 video lessons of about 20 minutes each one Virtual classrooms/ web-streaming conference and duration: • 1 Virtual classrooms/ web-streaming of about 1 hour • Lecture note: yes • Case Study: no
Other supporting material	Video links and references: yes
Formative evaluation	Topical quickcheck questions (open-ended and multiple choice) Sample application problem

Lesson N.	4
Lesson title	Derivatives and Options
Duration	2 hours and 30 minutes +-
Specific objectives	
Topics	• Forward, futures, and swaps • Options • Put-call parity • Binomial model • Option pricing through replication • Option pricing through risk neutral probability • Stochastic calculus (Brownian motion and Ito's lemma) • Option pricing through replication (delta hedge) • Option pricing through risk neutral probability • Black-Scholes option pricing formula

In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	Audio/Video Lessons and duration: 3 video lessons of about 25 minutes each one Virtual classrooms/ web-streaming conference and duration: ● 1 Virtual classrooms/ web-streaming of about 1 hour ● Lecture note: yes ● Case Study: no
Other supporting material	Text reference link : yes
Formative evaluation	Topical quickcheck questions (open-ended and multiple choice) Sample application problem

Lesson N.	5
Lesson title	Global market investments
Duration	2 hours
Specific objectives	● Explain why should investors should have global perspective regarding investments ● Explain what has happened to the relative size of foreign stock and bond markets ● Understand what are the differences in the rates of return on U.S. and foreign securities markets ● Know how can changes in currency exchange rates affect the returns that U.S. investors experience on foreign securities ● Determine if there is an additional advantage of diversifying in international markets beyond the benefits of domestic diversification ● Identify what alternative securities are available and what are their cash flow and risk properties ● Describe what is the historical return and risk characteristics of the major investment instruments

	• Discover what is the relationship among returns for foreign and domestic investment instruments and what is the implication of these relationships for portfolio diversification
Topics	• Global investment perspective • Background on stock and bond markets • Currency differences; Its impact on expected • International market diversification • Alternative securities ; cash flow and risk properties • Investment instrument • Relationship between foreign and domestic investment instruments • Portfolio diversification
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	Audio/Video Lessons and duration: 3 video lessons of about 20 minutes each one Virtual classrooms/ web-streaming conference and duration: • 1 Virtual classrooms/ web-streaming of about 1 hour • Lecture note: yes • Case Study: no
Other supporting material	
Formative evaluation	Caselet discussion Project work

Lesson N.	6
Lesson title	Securities Markets; Organization, Functions and Indices
Duration	2 hour and 30 minutes +-
Specific objectives	• Discuss what is the purpose and function of a market

	• Enumerate what are the characteristics that determine the quality of a market • Distinguish what is the difference between a primary and secondary capital market and how do these markets support each other • Discuss the national exchanges and how are the major security markets becoming linked • Understand what are the regional stock exchanges and the over-the-counter (OTC) market • Familiar with the alternative market-making arrangements available on the exchanges and the OCT market • Identify some major uses of security-market indexes • Determine the major characteristics that cause various indexes to differ • Discuss the major stock-market indexes in the United States and globally, and what are their characteristics • Study the major bond-market indexes for the United States and the world • Understand why are bond indexes more difficult to create and maintain than stock indexes • Describe some of the composite stock-bond market indexes • Determine sources of historical and current data for all the indexes • Discuss the relationship among many of these indexes in the short-run (monthly)
Topics	• Functions stock market • Quality of market • Primary and secondary capital market • National exchanges/stock exchanges • Over-the-counter (OTC) market • Alternative market • Uses of security-market indexes • Indices and its changes • Stock-market indexes in the advance economies and globally • Bond-market • Stock vs bond indexes

	• Composite indexes • Short run and long run indexes
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	Audio/Video Lessons and duration: 4 video lessons of about 20 minutes each one Virtual classrooms/ web-streaming conference and duration: • 1 Virtual classrooms/ web-streaming of about 1 hour • Lecture note: yes • Case Study: no
Other supporting material	Video link supplements : yes Video documentary : yes
Formative evaluation	Topic drill questions

Lesson N.	7
Lesson title	Asset Pricing Models
Duration	2 hours
Specific objectives	• Identify the assumptions of the capital asset pricing model • Determine the risk-free asset and what are its risk-return characteristics • Discuss the relationship of covariance and correlation between the risk-free asset and a risky asset or portfolio of risky assets • Determine the expected return when combining the risk-free asset and a portfolio of risky assets • Discuss the standard deviation when combining it with the risk-free asset and a portfolio of risky assets • Study the combination of risk-free asset and a portfolio of risky assets on the Markowitz efficient frontier

Topics	● Capital asset pricing model (CAPM) ● Risk-return ● Covariance and correlation > free asset and > risky asset > portfolio of risky assets ● Expected return ● Standard deviation ● Markowitz efficient frontier >risk-free asset >portfolio of risky assets
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	Audio/Video Lessons and duration: 3 video lessons of about 20 minutes each one Virtual classrooms/ web-streaming conference and duration: ● 1 Virtual classrooms/ web-streaming of about 1 hour ● Lecture note: yes ● Case Study: no
Other supporting material	
Formative evaluation	Topical quickcheck questions both multiple choice and open ended.

Lesson N.	8
Lesson title	Introduction to Portfolio Management
Duration	2 hours
Specific objectives	● Discuss risk aversion, and what evidence indicates that investors are generally risk averse ● Describe the basic assumptions behind the Markowitz portfolio theory ● Understand and explain what is meant by risk, and what are some of the alternative measures of risk used in investments

	• Explain and demonstrate how to compute the expected rate of return for an individual risky asset or a portfolio of assets • Explain and demonstrate how to compute the standard deviation of rates of return for an individual risky asset
Topics	• Risk aversion and its evidences • Markowitz portfolio theory • Investment risk • Expected return >individual assets >portfolio of assets • Standard deviation of rates of return >individual risky asset
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	Audio/Video Lessons and duration: 3 video lessons of about 20 minutes each one Virtual classrooms/ web-streaming conference and duration: • 1 Virtual classrooms/ web-streaming of about 1 hour • Lecture note: yes • Case Study: no
Other supporting material	Video link supplements: yes
Formative evaluation	Topical quickcheck questions multiple choice and/or open ended.

Lesson N.	9
Lesson title	Capital Markets; Microanalysis and Macrovaluation
Duration	2 hours
Specific objectives	• Discuss what is meant by capital market is efficient • Understand why should capital markets needs to be efficient

	• Determine the factors contribute to an efficient market • Discuss how to test the three efficient market subhypotheses and their result of test • Explain the behavioral finance and how does it relate to efficient market hypotheses • Discuss the expected and the empirical relationships between economic activity and security markets • Understand the macroeconomic approach to estimating future market returns • Determine the major macroeconomic techniques used to project the securities market • Identify the leading economic indicator approach what are its uses and shortcomings • Explain with depth the expected and the empirical relationships between the growth of the money supply and stock prices
Topics	• Capital market efficiency • Factors contributing to an efficient market • Three efficient market subhypotheses and their result of test • Behavioral finance and market hypotheses • Economic activity and security markets relationship • Macroeconomic environment • PESTL (Political, Economic, Social, Technological and Legal) in securities market • Economic indicators in capital market • Stock prices and money supply
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	Audio/Video Lessons and duration: 3 video lessons of about 20 minutes each one Virtual classrooms/ web-streaming conference and duration: • 1 Virtual classrooms/ web-streaming of about 1 hour • Lecture note: yes • Case Study: no

Other supporting material	
Formative evaluation	Topical quickcheck questions multiple choice and/or open ended.

Lesson N.	10
Lesson title	Industry Analysis and Financial Statement Analysis
Duration	2 hours and 30 minutes+-
Specific objectives	• Discuss what is an industry • Determine which industries will benefit most from present and emerging economic environment • Describe the industry life cycle and its features • Identify the tools for industry analysis • Discuss what are financial statements • Understand the importance of financial statement in doing investment • Determine the users of financial statements • Identify the various tools, methods and techniques necessary in financial statement analysis
Topics	• Industry and its economic environment • Industry life cycle and its features • Tools for industry analysis • Financial statements • Importance of financial statement • Users and uses of financial statements • Tools and techniques in FS analysis
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	Audio/Video Lessons and duration: 3 video lessons of about 25 minutes each one Virtual classrooms/ web-streaming conference and duration: • 1 Virtual classrooms/ web-streaming of about 1 hour • Lecture note: yes • Case Study: no

Other supporting material	
Formative evaluation	Topical quickcheck questions multiple choice and/or open ended.

Lesson N.	11
Lesson title	Security Valuation and Equity Portfolio Management Strategies
Duration	2 hours
Specific objectives	• Discuss the valuation philosophy, approaches, and techniques • Describe the valuation techniques for market, industries and securities • Enumerate and discuss macroeconomic indicators • Discuss the relationship of structural changes to securities valuation • Discuss equity in a portfolio • Describe the passive equity portfolio management • Identify some passive equity strategies • Explain the index portfolio construction techniques • Discuss and present a demo problem on Quadratic Optimization or programming techniques
Topics	• Valuation philosophies and techniques • Macroeconomic indicators • Structural changes to securities valuation • Equities portfolio • Passive equity portfolio management • and strategies • Index portfolio construction techniques • Quadratic Optimization or programming techniques
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion

Distance learning type of learning object /task	Audio/Video Lessons and duration: 3 video lessons of about 20 minutes each one Virtual classrooms/ web-streaming conference and duration: ● 1 Virtual classrooms/ web-streaming of about 1 hour ● Lecture note: yes ● Case Study: no
Other supporting material	
Formative evaluation	Topical quickcheck questions multiple choice and/or open ended.

Financial Technology and digital innovation to modeRnise and develop cUrricula of VietnameSe and Philippines UniversiTies

Project № 610256-EPP-1-2019-1-IT-EPPKA2-CBHE-JP

MASTER IN FINTECH AND DIGITAL INNOVATION

- MODULE SYLLABUS -

Co-funded by the Erasmus+ Programme of the European Union

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Deliverable number and name	MASTER IN FINTECH AND DIGITAL INNOVATION - MODULE SYLLABUS -
Due date	/
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Author	Alessandro Gennaro (USGM)
Reviewers	/
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Issue date	Version	Comments

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Table of Contents

1. Module details 4
2. Module description 4
3. Learning Outcomes 4
4. Module knowledge, skills and competencies (EQF*) 5
5. Module lessons 6

1. Module details

Module Title	ADVANCED CORPORATE FINANCE
Credits	/
Hours	45h
N° of hours in presence	15h
N° of hours in distance learning	*At least 15*
Name of the leading institution	USGM

2. Module description

This module focuses on how Directors or CFO should use principles and methods of financial theory and practices to maximize the firm value, in a global context. The pivotal questions of the optimal investment policies and optimal capital structure (mix of equity and debt) of the firm will be addressed, moving from financial theories to managerial practices. The module will consider financial operations that affect the asset structure (such as cash holding, investment projects, mergers and acquisitions, etc.) and capital structure (such as IPOs and buy-backs of stocks or bonds, dividend payments, leveraged buyouts, etc). The module is designed to provide a thorough understanding of the complete corporate process; corporate financial strategies, financial planning and budgeting, deal assessments, capital budgeting decisions will therefore be an integral part of the module. Particular attention will be devoted to the risk governance and risk management, not only regarding financial risk factors, but all the risk factors of a firm. A part of the course aims to develop the students' understanding of corporate financial management in an international context (cash management and risk management of MNCs). It relates to the decision-making problems about planning, allocation and control of sources of finance.

3. Learning Outcomes

The course overall learning outcomes are:

Knowledge and Understanding:

a. The course will strengthen the theoretical and methodological knowledge of corporate finance for careful analyses and evaluations of projects and companies, in a globalized context. It will offer also practical tools to manage real opportunities and problems, with relevant financial impacts, in the field of investment policies, financing policies, risk governance.
b. Students are expected to demonstrate an in-depth understanding of core concepts of Advanced Corporate Finance (investment opportunities analysis and choices, optimal capital structure definition and realization).
c. Students are expected to acquire the ability to collect and interpret real financial data in order to deal with investment and financing decisions, risk analysis and coverage, and to judge company's value creation process.
d. The course will lead students to solve and manage real business cases both at corporate and business levels.

Application and Problem-Solving Abilities:
Students will be able:

a. to assess the role of the financial manager and the impact of his decisions on company's value creation process;
b. to apply investment decision-making techniques, within different scenarios and uncertainty;
c. to apply the main analytical tools, functions and online resources for business and financial modeling
d. to apply an integrated understanding of markets and firms dynamics, in the context of technology-based finance
e. to plan and execute significant research and development projects of financial management.

4. Module knowledge, skills and competencies (EQF*)

Students will acquire the knowledge and analysis tools that will allow them to deal with financial problems in a complex and dynamic context. Students will acquire the practical knowledge to act as Chief Financial Officer in domestic or multination firms. They will be able to develop discernment skills of the various problems relating to investments and the acquisition of financial resources by companies following strictly financial logics. Moreover, at the end of this course, the student will be able to (*https://europa.eu/europass/en/european-qualifications-framework-eqf) :

- *Memorize and describe theories and tools of Advanced Corporate Finance;*
- *Identify the main problems and questions of global financial management;*
- *Apply methods and models of Financial Theory in the corporate problem-solving and decision-making processes;*
- *Classify, analyze, interpret, and predict the behaviour of the main financial variables of an*

international context;

- *Design future competitive scenarios and hypothesize financial strategies and policies for domestic and multinational companies;*
- *Evaluate convenience and profitability of investment, financial and risk policies, estimating their impact on the firm value.*

Communications Skills

The enhancement of written and oral communication skills will be encouraged by participation in business cases' analysis during the course. The communication skills will in particular be oriented to the critical analysis and solution of financial management problems within the company in different economic and business contexts, as well as to the development of active and critical comparisons with respect to the business issues addressed.

5. Module lessons

First part: ADVANCED CAPITAL BUDGETING

Lesson N.	1
Lesson title	ADVANCED CAPITAL BUDGETING (ACB)
Duration	1h
Specific objectives	The lesson has the objective to lead the students to apply the main techniques to evaluate investment projects considering their (domestic or international) scope and, consequently, their specific risks.
Topics	NPV, IRR, Pay-back period,
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson
Other supporting material	

Lesson N.	2

Lesson title	FINANCIAL PLANNING AND RISK ANALYSISI FOR ACB
Duration	1h
Specific objectives	The lesson has the objective to lead the students to build operative, Excel-based, models for defining cash flows (financial planning) and analysing and measuring risks (risk analysis) of a domestic or international investment project.
Topics	Free cash Flow, Sensitivity and Scenario Analysis, Montecarlo Simulation, Decision Tree Analysis
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson
Other supporting material	

Lesson N.	3
Lesson title	COST OF CAPITAL ESTIMATION FOR ACB
Duration	1h
Specific objectives	The lesson has the objective to lead the students to undestand the capital markets theories and the risk pricing models; to apply the Capital Asset Pricing Model and alternative models for systematic risk.
Topics	CAPM, APT, Muti-factors models
In presence activity	
Distance learning type of learning object /task	• Lecture note
Other supporting material	

Lesson N.	4

Lesson title	REAL OPTION APPROACH FOR ACB
Duration	1h
Specific objectives	The lesson has the objective to introduce students to the "contingent claim" approach into analysis and valuation of investment opportunity for a firm.
Topics	
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson
Other supporting material	

Second part: CORPORATE FINANCIAL STRATEGIES

Lesson N.	5
Lesson title	FINANCING POLICIES AND DIVIDEND POLICIES
Duration	1h
Specific objectives	
Topics	Fund raising for domestic and multinational companies; Information Asymmetries and markets incompleteness.
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Lecture note
Other supporting material	

Lesson N.	6
Lesson title	MARGERS & ACQUISITIONS
Duration	1h
Specific objectives	
Topics	

In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Lecture note
Other supporting material	

Lesson N.	7
Lesson title	LEVEREGE BUY-OUT (LBOs) and MANGEMENT BUY-OUT (MBOs)
Duration	1h
Specific objectives	
Topics	
In presence activity	
Distance learning type of learning object /task	• Lecture note
Other supporting material	

Lesson N.	8
Lesson title	INITIAL PUBLIC OFFERING (IPOs)
Duration	1h
Specific objectives	
Topics	
In presence activity	
Distance learning type of learning object /task	• Video lesson • Lecture note
Other supporting material	

Lesson N.	9
Lesson title	FINANCE FOR SMEs' GROWTH: PRIVATE CAPITAL

Duration	1h
Specific objectives	
Topics	Private Equity; Private Debt
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test
Other supporting material	

Third part: ADVANCED FINANCIAL MANAGEMENT

Lesson N.	10
Lesson title	SHORT TERM FINANCING
Duration	1h
Specific objectives	
Topics	Supply Chain Finance; FinTech solutions
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test
Other supporting material	

Lesson N.	11
Lesson title	INTERNATIONAL CASH MANAGEMENT
Duration	1h
Specific objectives	
Topics	

In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Lecture note
Other supporting material	

Lesson N.	12
Lesson title	CORPORATE RISK GOVERNANCE
Duration	1h
Specific objectives	
Topics	Risks measurement and evaluation; Risk measures application; Organization of the risk management function (process and tasks).
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson
Other supporting material	

Lesson N.	13
Lesson title	CORPORATE RISK MANAGEMENT
Duration	1h
Specific objectives	
Topics	Financial risk management for multinational companies; Financial risk hedging instruments (financial derivatives)
In presence activity	
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test

Other supporting material	

Add tables for additional lessons if necessary

Financial Technology and digital innovation to modeRnise and develop cUrricula of VietnameSe and Philippines UniversiTies

Project № 610256-EPP-1-2019-1-IT-EPPKA2-CBHE-JP

MASTER IN FINTECH AND DIGITAL INNOVATION

- MODULE SYLLABUS -

Co-funded by the Erasmus+ Programme of the European Union

DELIVERABLE DESCRIPTION	
Deliverable number and name	MASTER IN FINTECH AND DIGITAL INNOVATION - MODULE SYLLABUS -
Due date	/
Work Package	WP2
Author	Ho Chi Minh Open University (VN)
Reviewers	/
Language	English
Approved by	All partners
Version	N. 1

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Issue date	Version	Comments

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Table of Contents

1. Module details 4
2. Module description 4
3. Learning Outcomes 4
4. Module knowledge, skills and competencies (EQF*) 5
5. Module lessons 5

1. Module details

Module Title	BIG DATA IN FINANCE
Credits	3 Vietnamese Credit Unit (5 ECTS approximately)
Hours	150 hours
N° of hours in presence	37.5 hours
N° of hours in distance learning	At least 15
Name of the leading institution	Ho Chi Minh City Open University

2. Module description

This module aims to introduce students to financial data, analysis tools analysing statistical models from these datasets, especially- the module focuses on two areas those are developing rapidly in the financial sector: 1) credit analytics (predicting default in personal loans, mortgages, and firms); 2) asset management. Moreover, students also are able to analyse the other topic from different areas in finance such corporate finance, venture capital…The module is based on Python and its ecosystem of packages (students can employ the SAS enterprise on Python)

3. Learning Outcomes

The course overall learning outcomes are:

Knowledge and Understanding:

a. Demonstrates in-depth understanding of recent big data applications and issues in finance;
b. Demonstrates an extraction of information and process for the decision-making based on large data sets;

Application and Problem-Solving Abilities:

a. Applies a significant range of specialist database and software operating, programming and other FinTech relevant skills;
b. Plans and executes significant research and development projects of financial technology;

4. Module knowledge, skills and competencies (EQF*)

Moreover, at the end of this course, the student will be able to

- Understand the big data and applications in the financial sectors (e.g., commercial and investment banking, private equity, venture capital, asset management) and outside the financial sector (corporate financial decision, treasury).
- Manage large datasets using software.
- Classify, analyse/make initial inferences for the daily/professional purposes based on large data sets.
- Build and forecast/predict models within the financial-banking theories for professional purposes (patterns for decision-making; evaluation or predict the trend. etc.)

5. Module lessons

Lesson N.	1
Lesson title	Big data introduction
Duration	28 hours (7 hours contact hours)
Specific objectives	Identify the big data definition. Understand the big data and its challenges/issues: biased/discrimination, privacy, etc.
Topics	+ Definition and concepts of big data/ AI/ Machine Learning. + Applications of big data in different sectors. + Critical role of big data in the financial areas. + Issues of big data.
In presence activity	Instructor presents the key concepts and asks students to work in a group to discuss the applications/issues of big data. Students are required to search for the Cambridge Analytica data scandal to discuss.
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Individual report

Other supporting material	Bernard Marr (2016). Big data in practice: how 45 successful companies used big data analytics to deliver extraordinary results. Wiley. ISBN:9781119278825 José María Canvanillas, Edward Curry and Wolfgang Wahlster (2016). New horizons for a data-driven Economy. Springer International Publishing AG Switzerland. ISBN: 978-3-31921569-3. Carlos Castillo (2016). Big Crisis Data: Social Media in Disasters and Time-Critical Situations. Cambridge University Press. https://doi.org/10.1017/CBO9781316476840

Lesson N.	2
Lesson title	Handling data
Duration	36 hours (9 hours contact hours)
Specific objectives	+ Understand the data format and styles. + Design how to manage data. + Describe the text processing in terms of finance. + Identify the representation of data.
Topics	+ Classify the data (Structured and unstructured data) and file formats + Manage the database by SQL. + Define concepts of text processing and applications. + Representing data.
In presence activity	Instructor presents the key theoretical concepts and explains the lesson. Students work in pairs to discuss the text processing application in financial aspects.

Distance learning type of learning object /task	● Audio/Video Lesson ● Virtual classroom/ web-streaming conference ● Lecture note ● Self-evaluation test
Other supporting material	Salahaldin Juba and Andrey Volkov (2017). Learning PostgreSQL 10: A beginner's guide to building high-performance PostgreSQL data solutions. 2nd edition. Packt Publishing. ISBN : 1788392019 Silberzahn, R., et al. (2018) Many analysts, one data set: mining transparently how variations in analytic choices affect results. *Advances in Methods and Practices in Psychological Science*, https://doi.org/10.1177/2515245917747646

Lesson N.	3
Lesson title	Big data financial analytics
Duration	72 hours (18 contact hours)
Specific objectives	Modelling in financial big data
Topics	+ Neutral Networks in Finance + Supervised Learning. + Semi-supervised Learning + Unsupervised learning. + Factor models + Data clustering
In presence activity	+ Instructor presents and discusses the definitions/concepts and gives examples of each model. + Students discuss the advantages/disadvantages of models and work in groups to identify their types of project

	(suggest using the SAS enterprises in Python to prepare/R or Python). + Students are required to present a group assignment on how to employ the data cluster to build a model for asset management/portfolio management.
Distance learning type of learning object /task	● Audio/Video Lesson ● Virtual classroom/ web-streaming conference ● Lecture note ● Self-evaluation test ● Group assignments.
Other supporting material	Irene Aldridge and Marco Avellaneda (2021) Big data science in finance. Wiley & Son. ISBN 9781119602996 Vignesh Prajapati (2013). Big data Analytics with A and Hadoop. Packt Publishing. ISBN 978-1-78216-328-2

Lesson N.	4
Lesson title	Application of big data in mortgages
Duration	14 hours (3.5 contact hours)
Specific objectives	+ Understand the process of big data and its application. + Be able to build a model to analyse.
Topics	+ Practice the analysis of loan performance on mortgages
In presence activity	+ Instructor provides the tools/explanation to access the Data Dynamics (from Fannie Mae). + Students present how they handle the data sets and process for the specified purpose.
Distance learning type of learning object /task	● Video example ● Lecture note ● Group presentation

Other supporting material	Iain L. J. Brown (2014). Developing Credit Risk Models Using SAS Enterprise Miner and SAS/STAT: Theory and Application. Cary, NC: SAS Institute Inc. ISBN 978-1-62959-488-0 Yves Hilpisch (2015). Python for finance: analyze big financial data. O'Reilly. ISBN: 978-1-491-94528-5

Financial Technology and digital innovation to modeRnise and develop cUrricula of VietnameSe and Philippines UniversiTies

Project № 610256-EPP-1-2019-1-IT-EPPKA2-CBHE-JP

MASTER IN FINTECH AND DIGITAL INNOVATION

- MODULE SYLLABUS -

Co-funded by the Erasmus+ Programme of the European Union

DELIVERABLE DESCRIPTION	
Deliverable number and name	MASTER IN FINTECH AND DIGITAL INNOVATION - MODULE SYLLABUS -
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Work Package	WP2
Author	Michael Young, Ariel Kelly Balan (Mapua)
Reviewers	/
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Approved by	All partners
Version	N. 1

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Issue date	Version	Comments

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Table of Contents

1. Module details 4
2. Module description 4
3. Learning Outcomes 4
4. Module knowledge, skills and competencies (EQF*) 5
5. Module lessons 5

1. Module details

Module Title	FINANCIAL ECONOMETRICS IN R/PYTHON
Credits	3 credit units
Hours	49.5 hours or 54 hours
N° of hours in presence	36 hours of asynchronous or blended delivery 13.5 or 18 hours of synchronous delivery
N° of hours in distance learning	36 hours asynchronous or blended delivery 13.5 or 18 hours of synchronous delivery
Name of the leading institution	Mapua University

2. Module description

This course builds on the introductory module and introduces basic programming in R/ to perform statistical analysis using the R Studio editor. You will apply your skills to empirical finance applications like stock market predictability using different factors from the literature. The module will also build on basic programming skills in Python to perform similar analysis but also as applied to financial modelling like options pricing and financial modelling.

3. Learning Outcomes

The course overall learning outcomes are:

Knowledge and Understanding:

a. Demonstrates a critical understanding of technology-based banking concepts (e.g. digital banking, open banking, etc.);
b. Demonstrates a critical understanding of the range of digital solutions in monetary systems (e.g. digital finance, InsurTech, etc.);
c. Demonstrates understanding and awareness of emerging technological enablers in banking and finance (e.g. digitalisation, automation, machine learning, AI, etc.);

Application and Problem-Solving Abilities:

a. Applies a significant range of specialist database and software operating, programming and other FinTech relevant skills;

b. Applies an integrated understanding of entrepreneurial dynamics, project and innovation management in the context of technology-based finance and banking (e.g. development of innovative products/ solutions?) could be research projects);

4. Module knowledge, skills and competencies (EQF*)

Moreover, at the end of this course, the student will be able to (*https://europa.eu/europass/en/european-qualifications-framework-eqf) :

- *apply financial econometrics methods using r/python*
- *apply linear and non-linear regression model in predicting global market price*
- *apply portfolio selection models for optimal asset allocation*
- *perform testing and validation of the developed models*

5. Module lessons

Lesson N.	1
Lesson title	Introduction to R/Python
Duration	18 hours (4.5 hours/week x 4 weeks)
Specific objectives	should be able to write simple program using r/python by importing data and library, and do basic statistical analysis for data visualization
Topics	• syntax and semantics and program structure of python and r programming • function • vectors and matrices • data frames • importing libraries and packages for data analysis • trading strategy • random variables and distribution • models of distribution
In presence activity	programming demonstration lecture discussion programming exercises

Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Case Study • Self-evaluation test
Other supporting material	• python/r programming IDE/tutorial • other related articles/textbooks/e-books

Lesson N.	2
Lesson title	financial econometrics fundamentals and modelling
Duration	18 hours (4.5 hours/week x 4 weeks)
Specific objectives	to apply basic financial econometrics using R/Python and be able to develop prediction model and estimation
Topics	Possible topics to cover: • analysis of high-frequency price observations • arbitrage pricing theory • asset price dynamics • optimal asset allocation (mean-variance model and safety-first model) • cointegration • event study (cause-and-effect study) • nonlinear financial models such as autoregressive conditional heteroskedasticity • realized variance • fund performance analysis such as returns-based style analysis • tests of the random walk hypothesis • the capital asset pricing model • the term structure of interest rates (the yield curve) • value at risk • volatility estimation techniques such as exponential smoothing models and RiskMetrics
In presence activity	programming demonstration lecture discussion programming exercises

Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test
Other supporting material	• Linear Models and Time Series Analysis – Wiley - Marc S. Paoelella • Inside Volatility Filtering – Wiley - Alireza Jahavari • python/r programming IDE/tutorial • other related articles/textbooks/e-books

Lesson N.	3
Lesson title	Financial Econometrics Project
Duration	13.5 hours (4.5 hours/week x 3 weeks) → 18 hrs (4.5 hours/week x 4 weeks)
Specific objectives	Be able to apply learnings from module 1 and 2 to come up with a research paper about Financial Econometrics Using R/Python.
Topics	Scheduled Topic Discussion with Each Student
In presence activity	Consultation with the faculty or professor
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test
Other supporting material	• Conference Paper and or Journal Article templates • other related articles/textbooks/e-books

Financial Technology and digital innovation to modeRnise and develop cUrricula of VietnameSe and Philippines UniversiTies

Project № 610256-EPP-1-2019-1-IT-EPPKA2-CBHE-JP

MASTER IN FINTECH AND DIGITAL INNOVATION

- MODULE SYLLABUS -

Co-funded by the Erasmus+ Programme of the European Union

DELIVERABLE DESCRIPTION	
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Work Package	WP2
Author	Dragana Makajić-Nikolić, Marija Kuzmanović (UB)
Reviewers	/
Language	English
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Table of Contents

1. Module details 4
2. Module description 4
3. Learning Outcomes 4
4. Module knowledge, skills and competencies (EQF*) 5
5. Module lessons 5

1. Module details

Module Title	RISK ANALYSIS AND QUANTITATIVE ASSET ALLOCATION
Credits	
Hours	
N° of hours in presence	
N° of hours in distance learning	*At least 15*
Name of the leading institution	

2. Module description

The aim of the course is to address risk analysis and asset allocation issues using available quantitative methods and techniques. By focusing on foundational analytical tools, the course covers: general problems of asset allocation, strategic and tactical asset allocation, forecasting, estimation error in asset allocation, decision and performance analysis, return measures, VaR, cVaR, Sharpe ratio, and mean-variance portfolio optimization. The course also covers use of quantitative methods for analysis of risks related to finance, including: market risk, credit risk, operational risk, liquidity risk, settlement risk, volatility risk, regulation risk, and other types of financial risks. The methods and techniques include: modelling, descriptive statistics, sampling and estimation, hypothesis testing, correlation and regression analysis, Monte Carlo simulation, and optimization. The significant amount of time will be devoted to practical application of theories using real data and available analytic and optimization software.

3. Learning Outcomes

The course overall learning outcomes are:

Knowledge and Understanding:

a. Demonstrates a critical understanding of the range of digital solutions in monetary systems (e.g. digital finance, InsurTech, etc.);
b. Demonstrates a critical awareness of current, emerging and future issues for FinTech.

Application and Problem-Solving Abilities:

a. Applies a significant range of specialist database and software operating, programming and other FinTech relevant skills;

4. Module knowledge, skills and competencies (EQF*)

Moreover, at the end of this course, the student will be able to (*https://europa.eu/europass/en/european-qualifications-framework-eqf) :

- *Collect, manage, and analyze financial market data and to measure the risk of their investments;*
- *Apply foundational analytical and optimization tools to asset allocation;*
- *Critically compare, contrast and evaluate the different analytics techniques for applicability to identified problems;*
- *Determine optimal investment portfolio;*
- *Implement quantitative methods on large financial data sets;*
- *Reports, demonstrate and implement obtained risk analysis and asset allocation results.*

5. Module lessons

Lesson N.	1
Lesson title	Introduction to Financial Risk Management
Duration	1h
Specific objectives	Provide students the core concepts of risk management and assessment as well as financial risk categories
Topics	• Risk Management • Risk Assessment • Financial risks: market risk, credit risk, operational risk, liquidity risk, settlement risk, volatility risk, regulation risk, and other types of financial risks.

In presence activity	• Lectures • Lecture discussion
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson
Other supporting material	

Lesson N.	2
Lesson title	Fundamentals of asset allocation
Duration	1h
Specific objectives	Provide students the knowledge about main phases and elements of asset allocation process
Topics	• Asset Management Objectives • Asset Classes • Approaches to Asset Allocation • Sources of Asset Risk and Return
In presence activity	• Lectures • Lecture discussion
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson • Self-evaluation test
Other supporting material	Rasmussen, M. (2002). *Quantitative Portfolio Optimisation, Asset Allocation and Risk Management: A Practical Guide to Implementing Quantitative Investment Theory*. Springer. (Chapters 1-3) Lumholdt, H. (2018). *Strategic and Tactical Asset Allocation*. Springer International Publishing. (Chapter 1)

Lesson N.	3
Lesson title	Strategic, Tactical, and Dynamic Asset Allocation
Duration	1h
Specific objectives	Provide students understanding of asset allocation strategies and skills to create appropriate ones.
Topics	• Strategic Asset Allocation • Tactical Asset Allocation • Dynamic Asset Allocation
In presence activity	• Lectures • Lecture discussion • Case Study
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson
Other supporting material	Schneeweis, T., Crowder, G. B., & Kazemi, H. B. (2010). *The new science of asset allocation: risk management in a multi-asset world* (Vol. 551). John Wiley & Sons. (Chapter 5) Lumholdt, H. (2018). *Strategic and Tactical Asset Allocation*. Springer International Publishing. (Chapters 1,3)

Lesson N.	4
Lesson title	Investment Objectives and Benchmark Selection
Duration	1h
Specific objectives	Provide students the knowledge about creating asset allocation policies through investment objectives identification and benchmark selection.
Topics	• Setting investment objectives

	• Benchmark Selection
In presence activity	• Lectures • Lecture discussion
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson • Self-evaluation test
Other supporting material	Rasmussen, M. (2002). *Quantitative Portfolio Optimisation, Asset Allocation and Risk Management: A Practical Guide to Implementing Quantitative Investment Theory*. Springer. (Chapter 8) Lumholdt, H. (2018). *Strategic and Tactical Asset Allocation*. Springer International Publishing. (Chapter 2)

Lesson N.	5
Lesson title	Traditional Asset Allocation Techniques
Duration	1h
Specific objectives	Provides the students traditional and simple asset allocation techniques and their strengths and weakness
Topics	• Screening approach • Stratification approach • Bottom-up/top-down approaches • Thematic approaches
In presence activity	• Lectures • Lecture discussion
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson
Other supporting material	Rasmussen, M. (2002). *Quantitative Portfolio Optimization, Asset Allocation and Risk*

	Management: A Practical Guide to Implementing Quantitative Investment Theory. Springer. (Chapter 9)

Lesson N.	6
Lesson title	Measuring Risk
Duration	1h
Specific objectives	Provide students the knowledge about risk measures based on historical data and understanding how risk measurement affects asset allocation.
Topics	• Traditional Approaches to Risk Measurement • Classic Sharpe Ratio • Other Measures of Risk Assessment • Portfolio Risk Measures • Other Measures of Portfolio Risk Measurement • Value at Risk, Conditional Value at Risk
In presence activity	• Lectures • Lecture discussion
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson • Self-evaluation test
Other supporting material	Schneeweis, T., Crowder, G. B., & Kazemi, H. B. (2010). *The new science of asset allocation: risk management in a multi-asset world* (Vol. 551). John Wiley & Sons. (Chapter 2)

Lesson N.	7
Lesson title	Estimating Model Parameters
Duration	1h

Specific objectives	Provide students the knowledge about the process of estimation of inputs for a quantitative risk analysis and asset allocation models, and skills to estimate model parameters using software tools.
Topics	• Expected Return and Risk • The Capital Asset Pricing Model • Factor Models • Volatility and Correlation • Return Distributions (Risk Characterization)
In presence activity	• Lectures • Lecture discussion • Exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson
Other supporting material	Rasmussen, M. (2002). *Quantitative Portfolio Optimization, Asset Allocation and Risk Management: A Practical Guide to Implementing Quantitative Investment Theory*. Springer. (Chapter 7) Lumholdt, H. (2018). *Strategic and Tactical Asset Allocation*. Springer International Publishing. (Chapters 6,7) Excel help & learning, Excel help & learning - Microsoft Support

Lesson N.	8
Lesson title	Modern portfolio theory - Markowitz Model
Duration	1h
Specific objectives	Provide students the knowledge about modeling portfolio optimization problem based on Modern portfolio theory (MPT) and skill to solve real problems.
Topics	• Description of the Datasets Considered for

	MPT • Mathematical model formulation • Portfolio optimization solution techniques and tools • Feasible portfolios and Mean-Variance Efficient Frontier • Diversification
In presence activity	• Lectures • Lecture discussion • Problems solving
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson • Individual assignment
Other supporting material	Braga, M. D. (2015). *Risk-based approaches to asset allocation: Concepts and practical applications*. Springer. (Chapter 2) Excel Solver Tutorial - Step by Step Easy to Use Guide For Excel's Solver, Excel Solver Tutorial - Step by Step Easy to use guide for Excel's Solver | solver

Lesson N.	9
Lesson title	Risk-Based Approaches to Asset Allocation (1) - Risk Parity
Duration	1h
Specific objectives	Provide students the core concepts of risk parity strategies.
Topics	• The Theoretical Background and Argument for Risk Parity • The Naïve Risk Parity Strategy
In presence activity	• Lectures • Lecture discussion • Exercises

Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson
Other supporting material	Braga, M. D. (2015). *Risk-based approaches to asset allocation: Concepts and practical applications*. Springer. (Chapter 3)

Lesson N.	10
Lesson title	Risk-Based Approaches to Asset Allocation (2) - Risk Parity
Duration	1h
Specific objectives	Provide students the knowledge of advanced risk parity strategies.
Topics	• The Optimal Risk Parity Strategy • Risk Parity Strategy and Leverage • Risk Parity Strategy and the Modern Portfolio Theory Framework
In presence activity	• Lectures • Lecture discussion • Exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson
Other supporting material	Braga, M. D. (2015). *Risk-based approaches to asset allocation: Concepts and practical applications*. Springer. (Chapter 3)

Lesson N.	11
Lesson title	Risk-Based Approaches to Asset Allocation (3)
Duration	1h
Specific objectives	To provide students the knowledge about specific risk-based strategies mainly focused on

	benefits of diversification and skills to solve real problems using software tools.
Topics	• The Equally-Weighted Approach • The Global Minimum-Variance Approach • The Most Diversified Portfolio Approach
In presence activity	• Lectures • Lecture discussion • Exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson • Self-evaluation test
Other supporting material	Braga, M. D. (2015). *Risk-based approaches to asset allocation: Concepts and practical applications*. Springer. (Chapter 4) Excel Solver Tutorial - Step by Step Easy to Use Guide For Excel's Solver, Excel Solver Tutorial - Step by Step Easy to use guide for Excel's Solver | solver

Lesson N.	12
Lesson title	Value-at-Risk (VaR)
Duration	1h
Specific objectives	Provide the students the core concepts and model of Value at Risk.
Topics	• Variance–Covariance VaR • Simulation of VaR • VaR Along the Efficient Frontier • Marginal Contributions to VaR
In presence activity	• Lectures • Lecture discussion • Exercises

Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson
Other supporting material	Rasmussen, M. (2002). *Quantitative Portfolio Optimization, Asset Allocation and Risk Management: A Practical Guide to Implementing Quantitative Investment Theory*. Springer. (Chapter 16)

Lesson N.	13
Lesson title	CVaR and EVT
Duration	1h
Specific objectives	Provide students the knowledge about extensions of Value-at-Risk
Topics	• Conditional VaR (CVaR) • Extreme Value Theory (EVT)
In presence activity	• Lectures • Lecture discussion • Exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson
Other supporting material	Rasmussen, M. (2002). *Quantitative Portfolio Optimization, Asset Allocation and Risk Management: A Practical Guide to Implementing Quantitative Investment Theory*. Springer. (Chapter 16)

Lesson N.	14
Lesson title	Optimal Hedging
Duration	1h

Specific objectives	Provide students the knowledge about an advanced derivative pricing methodology.
Topics	• Dynamic Hedging and Replication • Wealth Change Equations • Optimal Hedging Monte Carlo Method
In presence activity	• Lectures • Lecture discussion • Exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson
Other supporting material	Chatterjee, R. (2014). *Practical methods of financial engineering and risk management: tools for modern financial professionals*. Apress. (Chapter 5)

Lesson N.	15
Lesson title	Tracking Error and Information Ratio
Duration	1h
Specific objectives	Provide students the knowledge about errors in parameters estimation and the skills for examine portfolio tracking errors.
Topics	• Absolute vs. relative risk measures • Decomposing tracking error • Information Ratio • Active Management Value Added
In presence activity	• Lectures • Lecture discussion
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Audio/Video Lesson

Other supporting material	Rasmussen, M. (2002). *Quantitative Portfolio Optimization, Asset Allocation and Risk Management: A Practical Guide to Implementing Quantitative Investment Theory*. Springer. (Chapter 14)

Financial Technology and digital innovation to modeRnise and develop cUrricula of VietnameSe and Philippines UniversiTies

Project № 610256-EPP-1-2019-1-IT-EPPKA2-CBHE-JP

MASTER IN FINTECH AND DIGITAL INNOVATION

- MODULE SYLLABUS -

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DELIVERABLE DESCRIPTION	
Deliverable number and name	MASTER IN FINTECH AND DIGITAL INNOVATION
Due date	4/6/2021
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Disclaimer

Table of Contents

1. Module details 4
2. Module description 4
3. Learning Outcomes 4
4. Module knowledge, skills and competencies (EQF*) 5
5. Module lessons 5

1. Module details

Module Title	BUSINESS VALUATION IN FINTECH CONTEXT
Credits	6
Hours	90 (45 hours of lectures & 36 hours of self – study and 9 hours of presentation of group projects)
N° of hours in presence	30 hours
N° of hours in distance learning	15 hours
Name of the leading institution	HCE

2. Module description

The purpose of this course is firstly is to provide the students an overview of business valuation. Secondly, this course focuses on the valuation of fintech companies and the methodologies of business valuation in fintech context. This course will also help the students to develop their practical skills in valuing fintech companies via some case studies.

3. Learning Outcomes

The course overall learning outcomes are:

Knowledge and Understanding:

a. Able to understand the core concepts and the principals of business valuation.

b. Able to understand the different activities of fintech companies and problems when valuing fintech companies.

c. Able to understand the different methods of fintech valuation.

Application and Problem-Solving Abilities:

a. Applies a significant range of specialist database and software operating, programming and other FinTech relevant skills;

b. Plans and executes significant research and development projects of financial technology;

4. Module knowledge, skills and competencies (EQF*)

Moreover, at the end of this course, the student will be able to (*https://europa.eu/europass/en/european-qualifications-framework-eqf) :

a. Memorize and describe the theories underlying valuation methods.
b. Understand the steps of business valuation procedure.
c. Recognize potential issues when valuing a Fintech company.
d. Analyze available information in order to value a Fintech company.
e. Identify the appropriate valuation method and conduct a valuation for a Fintech company.
f. Prepare a business valuation report.

5. Module lessons

Lesson N.	1
Lesson title	Overview of business valuation
Duration	18 hours (6 hours of lectures in presence, 3 hours of distance learning and 9 hours of self-study)
Specific objectives	Provide the students the core concepts and models of business valuation
Topics	Valuation concepts Purpose of valuation Business valuation steps Valuation techniques
In presence activity	Lectures Problems solving
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note • Self-evaluation test

Other supporting material	Palepu, Krishna G., and Paul M. *Healy (2013), Business Analysis and Valuation: Using Financial Statements, Text and Cases*. 5th ed. Cengage Learning. Stickney, Clyde P., Paul R. Brown, and James M. Wahlen (2007), *Financial Reporting, Financial Statement Analysis, and Valuation: A Strategic Perspective*. Mason, OH: Thomson/South-Western.

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Lesson N.	2
Lesson title	Overview of Fintech
Duration	12 hours (6 hours of lectures in presence, 3 hours of lectures of distance learning and 3 hours of self-study)
Specific objectives	Provide the students the knowledge of Fintech industry and the differences between traditional corporate valuation and Fintech valuation.
Topics	Fintech history Fintech activities Defining problems when valuing Fintech company.
In presence activity	Lectures
Distance learning type of learning object /task	● Audio/Video Lesson ● Virtual classroom/ web-streaming conference ● Lecture note ● Self-evaluation test
Other supporting material	Mercer Capital (2018), How to Value an Early-Stage FinTech Company

Lesson N.	3
Lesson title	Valuation Methodology for Fintech companies
Duration	30 hours (12 hours of lecture in presence, 6 hours of distance learning and 12 hours of self – study)
Specific objectives	Provides the students different methods to value a Fintech company, the strengths and weakness of each method when applying for Fintech companies.
Topics	Equity method Income approach Mixed equity – Income method Discounted cash – flow method Multiples methods Other methods: Economic value added, Residual Income Model
In presence activity	Lectures Discussion Problem solving
Distance learning type of learning object /task	● Audio/Video Lesson ● Virtual classroom/ web-streaming conference ● Lecture note ● Self-evaluation test
Other supporting material	Mercer Capital (2018), How to Value an Early-Stage FinTech Company Palepu, Krishna G., and Paul M. Healy (2013), Business Analysis and Valuation: Using Financial Statements, Text and Cases. 5th ed. Cengage Learning. Moro-Visconti R. (2021) FinTech Valuation. In: Startup Valuation. Palgrave Macmillan, Cham.

Lesson N.	4.
Lesson title	Fintech valuation in practice
Duration	12 hours (6 hours of lectures in presence, 3 hours of distance learning and 3 hours of self-study)
Specific objectives	Help the students to get a better understanding about how to apply different methods in valuing Fintech companies
Topics	Case study on fintech valuation
In presence activity	Problem-solving Discussion
Distance learning type of learning object /task	
Other supporting material	Mercer Capital (2018), How to Value an Early-Stage FinTech Company Moro-Visconti R. (2021) FinTech Valuation. In: Startup Valuation. Palgrave Macmillan, Cham.

Lesson N.	5.
Lesson title	Business Valuation Project and Student Presentation
Duration	18 hours (9 hours of presentation and 9 hours of self-study)
Specific objectives	Help the students to develop their practical skills of valuing Fintech companies
Topics	Choose a Fintech company with easy assessment of information and determine its value using a appropriate method.
In presence activity	Students work in group of 3 students and present their valuation project in class
Distance learning type of learning object /task	
Other supporting material	