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	University of Belgrade (Dragana Makajić Nikolić)
Reviewers	/
Language	English
Approved by	All partners
Version	N. 2

Document history

Issue date	Version	Comments
27/09/2021	1	/
31/05/2022	2	Updated version

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1. Module details*

Module Title	Analytics and Programming in finance
Total hours	around 188 hours
In presence activities /lecturers	at least 18 hours
Distance learning material	around 107 hours
Individual study (individual study supported by case studies, exercises/formative assessment, web references, individual project work etc.)	around 63 hours
ECTS**	7.5
Summative evaluation	Essay type of test, Case Studies, Research, Output, Critique Paper, Problem Solving, Self-assessment test

**The syllabus of the TRUST Master is structured according to the European Credit Transfer System (ECTS). The Master delivering is then managed by each university at international level according to the national /local regulations on the accreditation requirements.*
***EU commission ECTS credits system: 25 hours = 1 ECTS*

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 understanding and awareness of emerging technological enablers in banking and finance (e.g. digitalisation, automation, machine learning, AI, 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;
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) :

- Critically compare, contrast and evaluate the different analytics techniques for applicability to identified problems;
- Use of statistics concepts and methods essential to identify, collecting the data and finding structure in data to make predictions
- Apply R to collect, manage, and analyze data from different sources
- Use of multiple mathematical modelling techniques
- Apply Python to solve mathematical models;
- Model validation and selection techniques
- Analyze, report, demonstrate and implement obtained solutions.
- Use of analytic techniques for finance applications;
- Analyze, model and solve specialized and complex problems in finance

5. Module lessons

Lesson N.	1
Lesson title	Fundamentals of Analytics
Specific objectives	To provide the core concepts of analytics. To explain the main steps of data analytics. To explain 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, theoretical • lecture discussion in group
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference (if any) • Lecture note • Video Lesson(s) • You tube Video(s)

Lesson N.	2
Lesson title	Collecting, Sorting, Prioritizing, and Storing Big Data
Specific objectives	To explain the role of Big Data in modern business. To describe the primary characteristics of Big Data. To understand the flow of data. To know the tools and applications for 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, theoretical • Lectures, practical • lecture discussion in group • Individual practical work
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference (if any) • Lecture note • Video Lesson(s) • You tube Video(s)

Lesson N.	3
Lesson title	Introduction to R Language for Statistical Computing
Specific objectives	Provide students core concepts of R
Topics	• Introduction: Getting started with R

	• 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, practical • lecture discussion in group • programming demonstration • individual programming exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference (if any) • Lecture note • Video Lesson(s) • You tube Video(s)

Lesson N.	4
Lesson title	Descriptive Analytics (1) - Basic Statistical Tools
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
In presence activity	• Lectures, theoretical • lecture discussion in group • drill and practice • individual exercise
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference (if any) • Lecture note • Video Lesson(s) • You tube Video(s)

Lesson N.	5
Lesson title	Descriptive Analytics (2) - Financial Statistics in R

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, practical • lecture discussion in group • programming demonstration • individual programming exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference (if any) • Lecture note • Video Lesson(s) • You tube Video(s)

Lesson N.	6
Lesson title	Predictive Analytics (1) - Linear Models for Financial Time Series
Specific objectives	Provide students the basic theories of linear time series. Introduce simple models for analyzing financial time series.
Topics	• Stationarity • Correlation and Autocorrelation Function • Linear Time Series • Simple Autoregressive Models
In presence activity	• Lectures, theoretical • lecture discussion in group • drill and practice • individual exercise
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference (if any) • Lecture note • Video Lesson(s) • You tube Video(s)

Lesson N.	7
Lesson title	Predictive Analytics (2) - Financial Time Series Analysis in R
Specific objectives	Provide the knowledge about financial time series.

	Apply analysis and visualization skills on financial time series.
Topics	• Examining Financial Time Series • Visualization of Financial Data
In presence activity	• Lectures, practical • lecture discussion in group • programming demonstration • individual programming exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference (if any) • Lecture notes • Video Lessons • You tube Video(s)

Lesson N.	8
Lesson title	Predictive Analytics (3) - Simple Forecasting in R
Specific objectives	Provide students the knowledge about forecasting, simple forecasting models. Enhance the practical skills to forecast using R. Explain and interpreter the results.
Topics	• Moving Average Models • Exponential Smoothing • Seasonal Models
In presence activity	• Lectures, practical • lecture discussion in group • programming demonstration • individual programming exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference (if any) • Lecture note • Video Lesson(s) • You tube Video(s)

Lesson N.	9
Lesson title	Predictive Analytics (4) – Advanced Forecasting in R
Specific objectives	Provide the knowledge on advanced forecasting models. Apply skills to forecast using R.
Topics	• Regression Models with Time Series Errors • Long-Memory Models

In presence activity	• Lectures, practical • lecture discussion in group • programming demonstration • individual programming exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference (if any) • Lecture note • Video Lesson(s) • You tube Video(s)

Lesson N.	10
Lesson title	Prescriptive Analytics (1) - Modelling
Specific objectives	Introduce the concepts of prescriptive model life cycle: modeling, model solving, and model adapting. 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, theoretical • lecture discussion in group • drill and practice • simulation • individual exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference (if any) • Lecture note • Video Lesson(s) • You tube Video(s)

Lesson N.	11
Lesson title	Prescriptive Analytics (2) - Model Solving
Specific objectives	Provide students the understanding of the different types of mathematical models for optimization problems; and Determine appropriate mathematical models and methods for an optimization problem.
Topics	• Linear Programming (LP) • Nonlinear Programming (NP) • Integer and Mixed Integer Programming (IP, MIP) • Dynamic Programming

	• Optimization with Data Uncertainty
In presence activity	• Lectures, theoretical and practical • lecture discussion in group • drill and practice • individual exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference (if any) • Lecture note • Video Lesson(s) • You tube Video(s)

Lesson N.	12
Lesson title	Introduction to Python Language
Specific objectives	To get familiar with Python programming environment. To determine the basic syntax and semantics of Python programming. To be able to write, test, and run Python programming codes.
Topics	• Introduction to Python: Syntax and Semantics; Program Structures; Functions; Vectors and matrices; Data Sets/Frames; Libraries and Packages; Random Variables and Distributions; Models of Distributions • Selection Program Structure: if statement; if-else statement; if/elif/else statement • Iterative/Looping Control Structure: for loop statement; while loop statement; break keyword; continue keyword • Function: Functions in Python; Built-in Functions; How To Define a Function: User-Defined Functions (UDFs); The return statement; How To Call a Function; Function Arguments in Python; Global vs Local Variables • Arrays, List and Matrices: Python Arrays; Python Lists; Python Matrices
In presence activity	• Lectures, practical • lecture discussion • programming demonstration • individual programming exercises • problems solving in group • case study exercise in group
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference (if any) • Lecture note • Individual report

	• Case Study • Group assignments • Group presentation • You tube Video(s)

Lesson N.	13
Lesson title	Prescriptive Analytics (3) - Solving LP Models in Python
Specific objectives	Review basic components of linear programming models. Be able to install and use Gurobi optimization package in Python using Anaconda. Learn how to code linear programming models in Python using Anaconda.
Topics	• Review of Linear Programming Models • Gurobi Optimization Package • Linear Programming in Python
In presence activity	• Lectures, practical • lecture discussion in group • drill and practice • programming demonstration • individual programming exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference (if any) • Lecture note • Video Lesson(s) • You tube Video(s)

Lesson N.	14
Lesson title	Prescriptive Analytics (4) - Solving NP Models in Python
Specific objectives	Review basic components of non-linear programming models. Learn how to code non-linear programming (NLP) models in Python using Anaconda.
Topics	• Review of Non-Linear Programming Models • Non-Linear Programming in Python
In presence activity	• Lectures, practical • lecture discussion • drill and practice • programming demonstration

	• individual programming exercises
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference (if any) • Lecture note • Video Lesson(s) • You tube Video(s)

Lesson N.	15
Lesson title	Prescriptive Analytics (5) - Solving IP Models in Python
Specific objectives	Review basic components of integer programming models. Learn how to code integer programming (IP) models in Python using Anaconda.
Topics	• Review of Integer Programming Models • Integer Programming in Python
In presence activity	• Lectures • lecture discussion • drill and practice • programming demonstration • programming exercises in group
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference (if any) • Lecture note • Video Lesson(s) • You tube Video(s) • Case Study

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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	Cecilia A Mercado, Roberto M Arguelles (SLU)
Reviewers	/
Language	English
Approved by	All partners
Version	N. 1

Document history

Issue date	Version	Comments
27/09/2021	1	/
31/05/2022	2	Updated version

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1. Module details*

Module Title	Money, Banking and Financial Institutions
Total hours	150 hours
In presence activities /lecturers	24 hours
Distance learning material	76 hours
Individual study (individual study supported by case studies, exercises/formative assessment, web references, individual project work etc.)	50 hours
ECTS**	6
Summative evaluation	Essay type of test, Case Studies, Research, Output, Critique Paper, Problem Solving, Self-assessment test

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***EU commission ECTS credits system: 25 hours = 1 ECTS*

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 institutions; 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:

- ✓ Apply a significant range of financial models and other FinTech relevant skills;
- ✓ Apply an integrated understanding of entrepreneurial dynamics, project and innovation management in the context of technology-based finance and banking
- ✓ 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

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 o Double coincidence of wants, Gresham's Law o Token vs. account-based money o "The Digitalization of Money" o Cryptocurrencies • Interest Rates, Risks and Bond Market Evaluations o Relative asset pricing, arbitrage o Yield curve, Forward rates, term structure, expectation hypothesis, … o Interest rate risk, default risk, variance risk and options, correlation risk and CDOs, CDS
In presence activity	Sharing of personal experience regarding the topic, Interactive discussion and critique of experiences
Distance learning type of learning object /task	• Video Lesson – 2 video lessons of about 30 minutes each • Lecture note • Essay, case study, problem solving • You tube Video(s) • Articles/Papers
Formative Evaluation	Sharing of personal experience regarding the topic

Lesson N.	2
Lesson title	The fundamental principles of asset pricing
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 o Absolute asset pricing, stochastic discount factor o Leverage and capital structure
In presence activity	Lecture discussion, question and answer
Distance learning type of learning object /task	• Audio/Video Lesson which will last for 30 minutes • Lecture note(s) • You tube Video(s) • Articles/Papers

Formative Evaluation	Sharing of experience or observation regarding the topic, Self-evaluation test: case study, problem solving

Lesson N.	3
Lesson title	Financial Institutions and Financial Frictions
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 o Gordon Growth Model, Efficient Market Hypothesis o Bubbles • Financial Frictions and Inefficiencies o Adverse selection, moral hazard, debt overhang, commitment problems, solvency vs. liquidity, o - Mitigation via collateral, securitization, intermediaries, …
In presence activity	Class lecture (F2F) discussion
Distance learning type of learning object /task	• Video lesson(s) • Lecture note(s) • You tube Video(s) • Articles/Papers
Formative Evaluation	Sharing problems and issues they have encountered in their engagement or in their reading regarding the current financial markets. Self-evaluation test: case study, problem solving

Lesson N.	4
Lesson title	Monetary and macroprudential policy management and Financial Crises
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 o Trust and reputation o Role of banks o Traditional vs. Modern Banking and Shadow Banking

	o Securitization o FinTech • Financial Crises, Systemic Risk, Financial Regulation o Amplification, multiple equilibria, liquidity spiral, endogenous risk, volatility paradox o Liquidity vs. Solvency o Bank Runs o Systemic Risk Measures and Financial Regulation o Great Recession o Euro crisis • Monetary and Macroprudential Policy o Mandates and goals of monetary policy, inflation targeting, Taylor rules o Time inconsistency and reputation o Accounting basics (Central banks, banks, and households' balance sheets) Boehm 146 o Transmission mechanism, time-inconsistency problem o Central banks and bubbles o Risky government debt, diabolic loop, stability and dominance concepts
In presence activity	Classroom Lecture and discussion
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference (if any) • Lecture note • Video Lesson(s) • You tube Video(s) • Articles/Papers
Formative Evaluation	Sharing of their knowledge regarding the topics in their own countries. Case Study Self-evaluation test: Critique paper and essay writing

Lesson N.	5
Lesson title	The international financial architecture
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 o Mundell Fleming Trilemma, pegs, dollarization, o Role of the IMF and other international banking institutions such as WB, ADB, etc.

	• Digitization of Money o Digital Currency Areas o Digital dollarization o The Digitization of Money
In presence activity	Class lecture and discussion, question and answer
Distance learning type of learning object /task	• Lecture note • Video Lesson(s) • You tube Video(s) • Articles/Papers
Formative Evaluation	Sharing of knowledge regarding the current set-up in their country. Self-evaluation test: essay, critique paper

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

INNOVATION, INTRAPRENEURSHIP AND ENTREPRENEURSHIP IN FINTECH CONTEXT- 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	Thomas Peschlen, Dane Lukic, Madhudsan Acharyya (GCU)
Reviewers	/
Language	English
Approved by	All partners
Version	V3

Document history

Issue date	Version	Comments
29 Oct 2021	V2	Updated module
26 Apr 2022	V3	Updated lessons details after producing the learning material and recordings

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1. Module details*

Module Title	Innovation, Intrapreneurship and Entrepreneurship in FinTech Context
Total hours	112 hours
In presence activities /lecturers	26 hours
Distance learning material	49 hours
Individual study (individual study supported by case studies, exercises/formative assessment, web references, individual project work etc.)	37 hours
ECTS**	4,5
Summative evaluation	Proposed formative assessment in addition to the assessment test: • Assessment 1: Individual assignment - 5 minute FinchTech business proposal pitch video (anticipation that it may take around 10 hours to produce content and video); suggested timing week 5/ halfway through the module. • 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 (anticipation that it may take around 20 hours to produce group report); suggested timing week 10/ end of module. • Suggested weighting is 40% presentation and 60% report. • Self-assessment test

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***EU commission ECTS credits system: 25 hours = 1 ECTS*

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);

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

Application and Problem-Solving Abilities:

a. 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);

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

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

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

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.

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
Specific objectives	- Gain understanding of the module purpose and content -Examine success case studies and consider success factors - Examine failure case studies and consider reasons for failure

	-Discuss key definitions
Topics	- Defining Innovation - Innovation and Entrepreneurship - Innovating in the FinTech Context - Examples of FinTech Innovation
In presence activity	● 1h Introductory Workshop ● 1 h final discussion/group reflection
Distance learning type of learning object /task	• 1h of recorded session on FinTech innovation and startups • Lecture note • Case study: yes (6 examples within the recorded session) • 1h of directed activity: Reflection and self-evaluation questionnaire (see formative evaluation section below)
Formative evaluation	Online questionnaire/ self-evaluation on entrepreneurial skills the profile (spider diagram) with annotation of strength and weakness to be posted in VLE (this could form later on basis for students to find groups with complementary profiles).

Lesson N.	2
Lesson title	Analyse local and global trends in FinTech
Specific objectives	- Demonstrate in-depth understanding of market and socio-economic trends impacting finance and technology - Demonstrate a critical awareness of current, emerging and future issues for FinTech particularly on sustainability - Show an integrated understanding of technology-based finance and banking to market trends - Apply insight and creativity to understand connections among players and evolution of the fintech space
Topics	-Horizon scanning (PEST) (incl. -Long term trends - Local trends in finance incl. FinTech opportunities - Global trends in finance incl. FinTech opportunities - UN PRME and SDGs drivers/ goals - social innovation and microfinance
In presence activity	● 1h Workshop introducing social innovation (incl. microfinance) as a source of “community/ social needs” ● 1 h final discussion/group reflection
Distance learning type of learning object /task	• 30min lecture offering industry perspettive

	• 30min of recorded lecture covering long term trend forecasting and generally sources of trend data; the conflict of location and globalisation of solutions • 1h exercise of identifying a trend considering how global/ local it is and what the implications are for finance and the opportunity for FinTech. • Lecture note
Formative evaluation	Online/ sharing in presence of short video recordings of sharing trends students have identified; the video recording is a basis for providing feedback on presentation skills e.g. stance, pace, speed, presence, etc and subsequently receiving feedback and identifying development needs. Feedback may also include some cohort level key pointers from the tutor about pitfalls and strengths of presentations (something students can be asked to check in their own videos again or if they can see it in other people's videos). Individual effort 20 minutes; overall duration dependent on cohort size.

Lesson N.	3.
Lesson title	Divergent thinking and ideation
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	-Innovation and Fintech professionals -Stages of innovation -Innovative team models -Divergent thinking -Innovation between entrepreneurship and intrapreneurship
In presence activity	The session can be delivered fully online or with 1/2 hours in presence activity. If delivered with in person, in person elements would be • 1h Online Team simulation, instructions for roles sent prior to simulation - Virtual classroom/ web-streaming
Distance learning type of learning object /task	• 1h Lecture on innovation and divergent thinking • 1h exploratory reading and posting on discussion board • Lecture note

Formative evaluation	Formative feedback on the performance in the team simulation and their use of divergent thinking and innovation concepts done in class. 20 min in presence or online formative feedback.

Lesson N.	4
Lesson title	Value proposition
Specific objectives	-Develop understanding of different value proposition models -Practice targeting value propositions -Develop a deeper critical understanding of product differentiation aspects
Topics	- Value creation - Market orientation - Value propositions - Targeting value propositions
In presence activity	• 1h Workshop, Value Proposition Canvas incl. - pitching exercise based on online rich pictures • 1h final discussion/group reflection
Distance learning type of learning object /task	• 1h Lecture on value creation, market orientation and targeting value propositions • 1h activity on creating a rich picture of a financial process (incl. desired outcomes – gains and barriers – pains) • Lecture note
Formative evaluation	Online presentation of value proposition canvas to solicit feedback on initial ideas from peers; Could be done asynchronously or in class; individual effort 20 minutes, overall duration dependent on cohort size. *Assignment clinic:* formative feedback on draft ideas for the Assignment 1 presentation (1 hour session) in person or online

Lesson N.	5
Lesson title	Intrapreneurship and organizational learning
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	• 1/2h summative assessment session
Distance learning type of learning object /task	• 1h lecture recording on Intrapreneurship and organisational learning • 1h Online lecture synchronous - Virtual classroom/web-streaming • Lecture note
Formative evaluation	Summative assessment taking place which includes formative feedback; peer evaluation is also encouraged as part of ideation process to form groups based on interest in each other's proposals.
Summative evaluation	Assessment 1: Individual assignment - 5-minute FinTech business proposal pitch video (anticipation that it may take around 10 hours to produce content and video); suggested timing week 5/ halfway through the module.

Lesson N.	6
Lesson title	Business Model I
Specific objectives	-Gain insights into Business Model Canvas system -Critically discuss consumer segmentation and its impact on a business start up -Practice developing sustainable revenue streams
Topics	- Business Model Canvas introduction - Customer relations - Channels - Consumer Segmentation - Revenue streams
In presence activity	• 1h Workshop of students/groups presenting customer relations, channels and revenue streams to others • 1h final discussion/group reflection
Distance learning type of learning object /task	• 1h Lecture introducing the Business Model Canvas and specifically consumer segmentation, customer relations, channels and revenue streams (Develop understanding on the value proposition models) • 1h Exercise to research and populate part of the Business Model Canvas • Lecture note: yes

	• Case study: no
Formative evaluation	Self-evaluation within the assessment groups on quality of evidence and what would require better evidence. Key entrepreneurial skill of soliciting and giving feedback; 30 minutes per group.

Lesson N.	7
Lesson title	Business Model II
Specific objectives	-Develop an in-depth understanding of activities and resources needed for a startup - Gain understanding of FinTech specific value chains - Practice developing cost structures - Develop supplying strategies
Topics	- Business Model Canvas (continued): value chain FinTech business - Key activities & resources - Key partners - Cost structure
In presence activity	• 1h Workshop of students/groups presenting activities, partners, cost structure • 1h final discussion/group reflection
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 • Lecture note
Formative evaluation	Self-evaluation within the assessment groups on quality of evidence and what would require better evidence. Key entrepreneurial skill of soliciting and giving feedback; 30 minutes per group.

Lesson N.	8.
Lesson title	Resource requirements – human, capital, technology
Specific objectives	- Gain a deeper understanding of human and technology resources in entrepreneurship - Review skills compositions and management structures - Develop recruitment strategies

	- Practice developing job adverts for specific Fintech recruitment
Topics	- Human and technical resources - Capital requirements - Recruitment strategies and competence profiles
In presence activity	• 1h Workshop considering non-finance and non-technology skills needed for a business operation e.g. marketing, personnel, accounting • 1h final discussion/group reflection
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 seminar activity on Human resources for a FinTech start up • Lecture note
Formative evaluation	Tutor given feedback on soundness of technology mapping, any gaps, etc. based on 1h mapping technological resources digital activity.

Lesson N.	9.
Lesson title	Ethics, Governance, Regulations and Operational Risk
Specific objectives	- Explore key FinTech product innovations - Identify the sources of fraud in FinTech supply chain and mitigation strategies - Understand the governance and regulatory issues in FinTech business - Manage the operational and conduct risk associated with Fintech
Topics	-FinTech Innovations -Fraud management -FinTech Governance & Ethics -FinTech Regulatory Sandbox
In presence activity	1h Workshop considering operational/ fraud risk and good governance – picking up on the online regulation-risk exercise 1h final discussion/group reflection
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.

	Lecture note Case study (included in the lecture slides)
Formative evaluation	Students submit an annotated outline of the report for tutor feedback. 1h

Lesson N.	10
Lesson title	Start-up Sustainability and Founder Exit Strategies
Specific objectives	- Provide an overview of sustainability in FinTechs and its link with SDGs - Identify of the sources of risk and opportunities of sustainable investments in FinTechs - Discuss FinTechs risk mitigation and exit strategies - Analyse a case study on strategic decision making in the presence of risk and uncertainty.
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 workshop/ lecture summarising key points of entrepreneurial thinking, innovation management for sustainability and planning for exit strategy • 1h final discussion/group reflection
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 sustainability (how will the business be able to protect/ continue developing new innovations) and founder exit strategies • Lecture note • Case study: external input as interviews for exit strategy
Formative evaluation	General evaluation of the module, what students enjoyed, what they learned most about and what needs improvement – individual 15 minutes.
Summative evaluation	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 (anticipation that it may take around 20 hours to produce a group report); suggested timing week 10/ end of module.

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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Issue date	Version	Comments
27/09/2021	1	/
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Table of Contents

1. Module details*

Module Title	Digital and Open Banking
Total hours	112 hours
In presence activities /lecturers	27 hours
Distance learning material	48 hours
Individual study (individual study supported by case studies, exercises/formative assessment, web references, individual project work etc.)	37 hours
ECTS**	4,5
Summative evaluation	Essay type of test, Case Studies, Research, Output, Critique Paper, Problem Solving, Self-assessment test

**The syllabus of the TRUST Master is structured according to the European Credit Transfer System (ECTS). The Master delivering is then managed by each university at international level according to the national /local regulations on the accreditation requirements.*
***EU commission ECTS credits system: 25 hours = 1 ECTS*

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 behavior 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	Digital and Open Banking
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.
Distance learning type of learning object /task	Video lesson Lecture note Essay, case study, problem solving You tube Video(s) Articles/Papers

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.
Distance learning type of learning object /task	Video lesson Lecture note Essay, case study, problem solving You tube Video(s) Articles/Papers

Lesson N.	3
Lesson title	3.1 Robo Advisors - Enhance Advisory Services - Intro 3.2. Robo Advisors - General Overview - Part 1 3.3. Robo Advisors - Robo Advisor - Part 2 3.4. Robo Advisors - Market Overview - Part 3 3.5. Robo Advisors - Implementation Stages - Part 4 3.6. Robo Advisors - Deus Tech. Approach to advisory services - Part 5 3.7. Video Deus Tech.
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. DEUS TECHNOLOGY Experience.

Topics	Asset management, analysis of new technologies for asset management (i.e., robo advisoring)
Distance learning type of learning object /task	Video lesson Lecture note Essay, case study, problem solving You tube Video(s) Articles/Papers

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.
Distance learning type of learning object /task	Video lesson Lecture note Essay, case study, problem solving You tube Video(s) Articles/Papers

Lesson N.	5
Lesson title	FinTech and Risk Management
Duration	1h
Specific objectives	This lecture covers how FinTech is affecting risk management function.
Topics	how different risks are affected by technology
Distance learning type of learning object /task	Video lesson Lecture note

	Essay, case study, problem solving You tube Video(s) Articles/Papers

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	How regulation is changing in order to allow technology to become part of banking business
Distance learning type of learning object /task	Video lesson Lecture note Essay, case study, problem solving You tube Video(s) Articles/Papers

Lesson N.	7
Lesson title	New technologies and banks' costs.
Duration	1h
Specific objectives	This lecture investigates how new technologies are modifying banks' costs.
Topics	It covers costs of technology, human resources and the interaction with choices on the distribution channels.
Distance learning type of learning object /task	Video lesson Lecture note Essay, case study, problem solving You tube Video(s) Articles/Papers

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	how banks' business models are more and more affected by the technological revolution.
Distance learning type of learning object /task	Video lesson Lecture note Essay, case study, problem solving You tube Video(s) Articles/Papers

Lesson N.	9
Lesson title	A Case Study of a FinTech Company. BKN301 Experience
Duration	1h
Specific objectives	Case study
Topics	This seminar is prepared by the CEO of a FinTech company which offers payment facilities.
Distance learning type of learning object /task	Video lesson Lecture note Essay, case study, problem solving You tube Video(s) Articles/Papers

Lesson N.	10
Lesson title	Digital Banking: Where the Market is Going
Duration	1h
Specific objectives	Future of the Digital Banking

Topics	This lecture analyses the most relevant trends in digital banking industry, in a global perspective.
Distance learning type of learning object /task	Video lesson Lecture note Essay, case study, problem solving You tube Video(s) Articles/Papers

Lesson N.	11
Lesson title	Digital Banking in Emerging Economies
Duration	1h
Specific objectives	Understand the impact of digital banking
Topics	This lecture analyses how digital banking is affecting the financial system, the economy and the society in emerging economies.
Distance learning type of learning object /task	Video lesson Lecture note Essay, case study, problem solving You tube Video(s) Articles/Papers

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
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Issue date	Version	Comments
27/09/2021	1	/
31/05/2022	2	Updated version

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1. Module details*

Module Title	Finance, Artificial Intelligence and Machine Learning
Total hours	163 hours
In presence activities /lecturers	30 hours
Distance learning material	79 hours
Individual study (individual study supported by case studies, exercises/formative assessment, web references, individual project work etc.)	54 hours
ECTS**	6.5
Summative evaluation	Essay type of test, Case Studies, Research, Output, Critique Paper, Problem Solving, Self-assessment test

**The syllabus of the TRUST Master is structured according to the European Credit Transfer System (ECTS). The Master delivering is then managed by each university at international level according to the national /local regulations on the accreditation requirements.*
***EU commission ECTS credits system: 25 hours = 1 ECTS*

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
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	● Lectures, theoretical ● lecture discussion in group ● Individual practical work
Distance learning type of learning object /task	● Virtual classroom/ web-streaming conference (if any) ● Lecture note ● Video Lesson(s) ● You tube Video(s) ● Articles/Papers

Lesson N.	2
Lesson title	Statistics and Probabilistic Theory
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	• Lectures, theoretical • lecture discussion in group • Individual practical work
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference (if any) • Lecture note • Video Lesson(s) • You tube Video(s) • Articles/Papers

Lesson N.	3
Lesson title	Machine Learning Fundamentals
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	• Lectures, theoretical • lecture discussion in group • Individual practical work
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference (if any) • Lecture note • Video Lesson(s) • You tube Video(s) • Articles/Papers

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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

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Author	Nguyen Duy Viet, Do Nguyen Nguyet Minh (VNU)
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27/09/2021	1	/
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1. Module details*

Module Title	Money System and Digital Financial
Total hours	137 hours
In presence activities /lecturers	23 hours
Distance learning material	68 hours
Individual study (individual study supported by case studies, exercises/formative assessment, web references, individual project work etc.)	46 hours
ECTS**	5,5
Summative evaluation	Essay type of test, Case Studies, Research, Output, Critique Paper, Problem Solving, Self-assessment test

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***EU commission ECTS credits system: 25 hours = 1 ECTS*

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
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	• Lectures, theoretical • Lectures, practical examples / open discussion • lecture discussion in group
Distance learning type of learning object /task	• Lecture note • Video Lesson(s) • You tube Video(s) • Articles/papers

Lesson N.	2
Lesson title	Interest Rates and Loanable Funds
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	• Lectures, theoretical • Lectures, practical examples / open discussion • lecture discussion in group

Distance learning type of learning object /task	• Lecture note • Video Lesson(s) • You tube Video(s) • Articles/papers

Lesson N.	3
Lesson title	Long-term Interest Rates and Inflation Expectations
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	• Lectures, theoretical • Lectures, practical examples / open discussion • lecture discussion in group
Distance learning type of learning object /task	• Lecture note • Video Lesson(s) • You tube Video(s) Articles/papers

Second part: State Bank of Vietnam Funds

Lesson N.	4
Lesson title	State Bank of Vietnam Funds: Reserve Requirements and Reserve Management
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	• Reserve Requirements and Reserve Management of State Bank of Vietnam • determination of the State Bank of Vietnam Funds Rate
In presence activity	• Lectures, theoretical • Lectures, practical examples / open discussion lecture discussion in group

Distance learning type of learning object /task	• Lecture note • Video Lesson(s) • Articles/papers

Lesson N.	5
Lesson title	State Bank of Vietnam: Policy Tools
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	• Lectures, theoretical • Lectures, practical examples / open discussion • lecture discussion in group
Distance learning type of learning object /task	• Lecture note • Video Lesson(s)

Lesson N.	6
Lesson title	State Bank of Vietnam: Transmission
Specific objectives	Monetary Transmission Mechanism, Inflation and Unemployment
Topics	
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	• Lecture note • Video Lesson(s) • Articles/papers

Third part: Fintech

Lesson N.	7
Lesson title	What is FinTech?

Specific objectives	Provide the core information and basic concepts of the Fintech introduction and its impact in the economy transformation
Topics	Fintech introduction, FinTech Transformation
In presence activity	Lectures, theoretical Lectures, practical examples / open discussion lecture discussion in group
Distance learning type of learning object /task	• Lecture note • Video Lesson(s)

Lesson N.	8
Lesson title	FinTech Evolution
Specific objectives	Provide the basic concepts of the Fintech evolution 1.0, 2.0 and 3.0 & 3.5
Topics	FinTech Evolution 1.0: Infrastructure FinTech Evolution 2.0: Banks FinTech Evolution 3.0 & 3.5: Startups and Emerging Markets
In presence activity	• Lectures, theoretical • Lectures, practical examples / open discussion • lecture discussion in group
Distance learning type of learning object /task	• Lecture note • Video Lesson(s) • You tube Video(s) • Articles/papers

Lesson N.	9
Lesson title	Industry Showcase
Specific objectives	Provide case studies as practical examples
Topics	Collaboration between Financial Institutions and Startups (The FinTech Association of Vietnam)
In presence activity	• Lectures, theoretical • Lectures, practical examples / open

	discussion • lecture discussion in group
Distance learning type of learning object /task	• Lecture note • Video Lesson(s)

Lesson N.	10
Lesson title	FinTech Typology, Fintech emerges Economics
Specific objectives	FinTech Typology, Emerging Economics
Topics	FinTech Typology, Emerging Economics: Opportunities and Challenges
In presence activity	• Lectures, theoretical • Lectures, practical examples / open discussion • lecture discussion in group
Distance learning type of learning object /task	• Lecture note • Video Lesson(s) • Articles/papers

Lesson N.	11
Lesson title	Industry Showcase
Specific objectives	Provide the basic concepts of The Future of RegTech and 6 Technologies Impacting It
Topics	The Future of RegTech and 6 Technologies Impacting It (Thomson Reuters)
In presence activity	• Lectures, theoretical • Lectures, practical examples / open discussion • lecture discussion in group
Distance learning type of learning object /task	• Lecture note • Video Lesson(s) • You tube Video(s) • Articles/papers

Forth part: Digital Finance and Alternative Finance

Lesson N.	12
Lesson title	A Brief History of Financial Innovation

Specific objectives	To be aware of the main history of Financial Innovation; Digitization of Financial Services; FinTech & Funds
Topics	History of Financial Innovation; Digitization of Financial Services; FinTech & Funds
In presence activity	• Lectures, theoretical • Lectures, practical examples / open discussion • lecture discussion in group
Distance learning type of learning object /task	• Lecture note • Video Lesson(s) • You tube Video(s) • Articles/papers

Lesson N.	13
Lesson title	Crowdfunding, P2P
Specific objectives	Understand the Crowdfunding, P2P processes
Topics	Crowdfunding – Regards, Charity and Equity P2P and Marketplace Lending The Rise of Vietnam TechFins – New Models and New Products
In presence activity	• Lectures, theoretical • Lectures, practical examples / open discussion • lecture discussion in group
Distance learning type of learning object /task	• Lecture note • Video Lesson(s) • You tube Video(s) • Articles/papers

Fifth part: **FinTech Regulation and RegTech**

Lesson N.	14
Lesson title	FinTech Regulations
Specific objectives	Any institution which is involved in financial activities must comply with various regulations, and this certainly applies to the fintech industry.

Topics	FinTech Regulations
In presence activity	• Lectures, theoretical • Lectures, practical examples / open discussion • lecture discussion in group
Distance learning type of learning object /task	• Lecture note • Video Lesson(s) • You tube Video(s) • Articles/papers

Lesson N.	15
Lesson title	The Future of Data-Driven Finance
Specific objectives	/
Topics	Case Study: Revolut (UK)
In presence activity	• lecture discussion in group
Distance learning type of learning object /task	• Lecture note • Video Lesson(s)

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	HCMCOU (VN)
Reviewers	/
Language	English
Approved by	All partners
Version	N. 1

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Issue date	Version	Comments
27/09/2021	1	/
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Table of Contents

1. Module details*

Module Title	Blockchain and applications
Total hours	112 hours
In presence activities /lecturers	27 hours
Distance learning material	48 hours
Individual study (individual study supported by case studies, exercises/formative assessment, web references, individual project work etc.)	37 hours
ECTS**	4,5
Summative evaluation	Essay type of test, Case Studies, Research, Output, Critique Paper, Problem Solving, Self-assessment test

**The syllabus of the TRUST Master is structured according to the European Credit Transfer System (ECTS). The Master delivering is then managed by each university at international level according to the national /local regulations on the accreditation requirements.*
***EU commission ECTS credits system: 25 hours = 1 ECTS*

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. 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:

- *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
Specific objectives	+ Understand the ideas behind the blockchain.
Topics	+ Decentralised ladger system + Blockchain: definition and a solution for a decentralized system.

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	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	2
Lesson title	Blockchain technology- an introduction (cont)
Specific objectives	+ Understand the ideas behind the blockchain.
Topics	+ Cryptographic concepts.
In presence activity	Instructor explains cryptographic concepts. 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	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	3
Lesson title	Blockchain platform
Specific objectives	+ Understand the classification of blockchain. + Distinguish the specifications of blockchain.
Topics	+ Blockchain philosophy.

In presence activity	+ Instructor explains and supervises students to discuss the concepts/definitions of blockchain.
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s)

Lesson N.	4
Lesson title	Blockchain platform (cont)
Specific objectives	+ Understand the classification of blockchain. + Distinguish the specifications of blockchain.
Topics	+ Blockchain platforms.
In presence activity	+ Instructor explains and supervises students to discuss the concepts/definitions of blockchain platforms.
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	5
Lesson title	Blockchain platform (cont)
Specific objectives	+ Understand the cryptocurrency. + Distinguish the specifications of cryptocurrency.
Topics	+ Cryptocurrency: bitcoin.
In presence activity	+ Instructor explains and supervises students to discuss the concepts/definitions of cryptocurrency. + Students prepare a presentation to introduce bitcoin (history, distributed P2P network, immutable ledger, forks and the role of money).
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	6
Lesson title	Blockchain platform (cont)
Specific objectives	+ Understand the cryptocurrency. + Distinguish the specifications of cryptocurrency.
Topics	+ Cryptocurrency: Ethereum.
In presence activity	+ Instructor explains and supervises students to discuss the concepts/definitions of cryptocurrency. + Students work in group to discuss: Ethereum's role in the Fintech ecosystem; and tokenizing share and Fund Raising.
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers • Group assignments

Lesson N.	7
Lesson title	Blockchain applications
Specific objectives	+ Classify the criteria for Blockchain application + Apply the blockchain for a firm activity.
Topics	+ Criteria for blockchain application. + Blockchain and firms.
In presence activity	+ Instructor explains the criteria to blockchain application.
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	8
Lesson title	Blockchain applications (cont)
Specific objectives	+ Verify the limitation, challenges and opportunities of blockchain

	+ Understand the requirements for the regulation for blockchain.
Topics	+ Cases with Blockchain + Risk and limitation of blockchain. + Challenges and Opportunities of blockchain. + Legal issues and regulation for blockchain.
In presence activity	+ Instructor provides topics, cases and supervises students to discuss. + Students discuss cases and risks/issues of blockchain.
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers • Group assignments/presentations.

Lesson N.	9
Lesson title	Blockchain applications- smart contracts in Ethereum
Specific objectives	+ Classify the smart contracts + Understand smart contracts applications
Topics	+ Smart contracts. + Smart contracts in Ethereum. + ERC standards + Comparison to Bitcoin
In presence activity	+ Instructor explains the 1st smart contracts: Ethereum. + Students discuss some specifications of the Ethereum platform.
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers • Group assignments/presentations.

Lesson N.	10

Lesson title	Blockchain applications- Advanced ledgers
Specific objectives	+ Analyse the purposes of ledgers + Understand ledgers applications
Topics	+ Internet of things. + Supply chain and connectivity. + Cybersecurity and private network. + Framework and emerging distributed ledgers
In presence activity	+ Instructor explains Ledgers and applications. + Students discuss other examples on ledgers.
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers • Group assignments/presentations.

Lesson N.	11
Lesson title	Future of blockchain
Specific objectives	+ Open source decentralised vs Closed source centralised + Some applications
Topics	+ The forms and applications. + Regulations, business models and opportunities.
In presence activity	+ Instructor discusses the future and the trend + Students discuss some specific applications in the near future in financial sectors.
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers • Group assignments/presentations.

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Work Package	WP2
Author	University of Cebu (PH)
Reviewers	/
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Approved by	All partners
Version	N. 1

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Table of Contents

1. Module details*

Module Title	Asset Pricing and Portfolio Management
Total hours	150 hours
In presence activities /lecturers	18 hours
Distance learning material	82 hours
Individual study (individual study supported by case studies, exercises/formative assessment, web references, individual project work etc.)	50 hours
ECTS**	6
Summative evaluation	Essay type of test, Case Studies, Research, Output, Critique Paper, Problem Solving, Self-assessment test

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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 introduces 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 software 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

- *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	Financial Market Institution and Investment Groups
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	• Investment Goals • Investment Groups - Banks - Foundations and Endowments - Insurance companies - Pension funds - Insurance companies - Mutual funds - Individual private firm - Institutional investors - Hedge funds • Tax incentives and disincentives
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	2
Lesson title	Asset Allocation and Investing

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 process Investment goals Asset allocation policy and its importance 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	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s)

	• Articles/papers

Lesson N.	3
Lesson title	Portfolio and Arbitrage Pricing Theory
Specific objectives	To understand the Portfolio and Arbitrage Pricing main Theories
Topics	• Modern portfolio theory • 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	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	4
Lesson title	Risk Management and Derivatives (Options, Forward, Futures, Swaps)
Specific objectives	To understand Risk Management and Derivatives main concepts and applications
Topics	• Risk management • Derivatives • Derivatives in practice • Options • Option pricing model • Binomial model • Binomial option pricing • Black-Scholes option pricing • Forward and future contracts • Swaps

	• Hedging
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	5
Lesson title	Global Market Investments
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	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • Articles/papers

Lesson N.	6
Lesson title	Securities Markets; Organization, Functions and Indices
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	• Stock market and stock exchanges Functions of stock market • Primary and secondary market • IPO and listing process • Market Indices and its changes
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion

Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers • Group assignments

Lesson N.	7
Lesson title	Asset Pricing Models
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	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	8
Lesson title	Introduction to Portfolio Management
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 and Risk aversion • Investment and corporate risk management • Markowitz portfolio theory • Expected return, variance, covariance and standard deviation of rates >individual assets >portfolio of assets
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers • Group assignments/presentations.

Lesson N.	9
Lesson title	Capital Markets; Microanalysis and Macrovaluation
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	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Group assignments/presentations.

Lesson N.	10
Lesson title	Industry Analysis and Financial Statement Analysis
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	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers • Group assignments/presentations.

Lesson N.	11
Lesson title	Security Valuation and Equity Portfolio Management Strategies
Specific objectives	• Discuss the valuation philosophy, approaches, and techniques • Describe the valuation techniques for market, industries and securities • Enumerate and discuss macroeconomic indicators • 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 • 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	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Group assignments/presentations.

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Module Title	Asset Pricing and Portfolio Management
Total hours	113 hours
In presence activities /lecturers	26 hours
Distance learning material	49 hours
Individual study (individual study supported by case studies, exercises/formative assessment, web references, individual project work etc.)	38 hours
ECTS**	4.5
Summative evaluation	Essay type of test, Case Studies, Research, Output, Critique Paper, Problem Solving, Self-assessment test

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2. Module description

This module focuses on how Directors or Managers 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 behavior 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	CAPITAL INVESTMENT DECISIONS
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. This lesson, after remembering that increasing the value of a company's shares is the goal of financial management, explains how to check whether a particular investment will achieve that goal or not. The lesson takes

	into consideration and illustrates the main techniques commonly used by managers and financial analysts. It also shows the circumstances under which some of these investment rules are likely to lead to bad investment decisions, and explains why the net present value approach is the right one. This lesson also investigates a relevant task: the cash flow estimation, which is a critical input into a net present value analysis.
Topics	NPV, IRR, Pay-back period, ALTERNATIVE Investment Rules; Incremental Cash Flows; Inflation effects;
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	✓ Video Lesson(s) ✓ Virtual classroom/ web-streaming conference (if any) ✓ Lecture note ✓ You tube Video(s) ✓ Articles/papers

Lesson N.	2
Lesson title	RISK ANALYSIS AND REAL OPTIONS
Duration	1h
Specific objectives	Because the cash flow forecasts almost always contain uncertainty, this lesson demonstrates how to compute the sensitivity of the NPV to the variability factors. The lesson illustrates the main techniques used by managers and analysts to perform the exam of NPV estimates, in order to evaluate their sensitivity to assumptions made about the forecasting inputs and variables. Therefore, the lesson has the objective: - to introduce students to the "contingent claim" approach into analysis and valuation of investment opportunity for a firm; - to lead the students to build operative, Excel-based, models for defining cash flows (financial planning) and analyzing and measuring risks (risk analysis) of an investment project.
Topics	Free cash Flow, Sensitivity and Scenario Analysis, Montecarlo Simulation, Real Options Decision Tree

	Analysis
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	✓ Video Lesson(s) ✓ Virtual classroom/ web-streaming conference (if any) ✓ Lecture note ✓ You tube Video(s) ✓ Articles/papers

Lesson N.	3
Lesson title	MULTINATIONAL CAPITAL BUDGETING (MCB)
Duration	1h
Specific objectives	This lesson explains why the multinational capital budgeting is a critical function for international companies (MNCs). An MNC evaluates international projects by comparing benefits and costs of business opportunities that will take place in different countries. The lesson illustrates the particular circumstances that influence future cash flows and the discount rate used to evaluate international projects.
Topics	Subsidiary and Parent perspective; Inputs for MCB; Factors of MCB; Project Risk Assessment
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	✓ Video Lesson(s) ✓ Virtual classroom/ web-streaming conference (if any) ✓ Lecture note ✓ You tube Video(s) ✓ Articles/papers

Second part: CORPORATE STRUCTURE AND FUND RISING

Lesson N.	4
Lesson title	OPTIMAL CAPITAL STRUCTURE
Duration	1h
Specific objectives	This lesson addresses a classic question in Corporate Finance: Is there a particular capital structure that

	maximizes firm value while providing maximum benefit to stockholders? The lesson tries to answer this question by demonstrating that, in a real world, capital structure decisions should consider corporate taxes, insolvency risk and bankruptcy costs, information asymmetries, manager preferences.
Topics	The "pie theory"; Financial leverage and firm value; Modigliani & Miller's propositions; tax shield; financial distress; pecking order theory.
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	✓ Video Lesson(s) ✓ Virtual classroom/ web-streaming conference (if any) ✓ Lecture note ✓ You tube Video(s) ✓ Articles/papers

Lesson N.	5
Lesson title	LONG_TERM FINANCING
Duration	1h
Specific objectives	This lesson describes how large and small businesses get long-term capital. Particular attention is paid to what is probably the most important phase of a company's financial life cycle: the initial public offering (IPO). The lesson illustrates the process by which companies move from private to public ownership.
Topics	Fundraising for domestic and multinational companies; Information Asymmetries and markets incompleteness; IPO; Long-term debt; Leasing.
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	✓ Video Lesson(s) ✓ Virtual classroom/ web-streaming conference (if any) ✓ Lecture note ✓ You tube Video(s) ✓ Articles/papers

Lesson N.	6

Lesson title	MULTINATIONAL COST OF CAPITAL AND CAPITAL STRUCTURE
Duration	1h
Specific objectives	This lesson explains how company and country characteristics are considered by a multinational company (MNC) when it establishes its capital structure. The lesson also illustrates, considering the differences in the cost of capital among countries, as the financing policy of an MNC influences its cost of capital and therefore its value.
Topics	Background on cost of capital; CoC for MNCs; CoC comparison using CAPM;CoC across countries;MNC's Capitalò structure decision; Interaction between Subsidiary and Parent financing decisions
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	✓ Video Lesson(s) ✓ Virtual classroom/ web-streaming conference (if any) ✓ Lecture note ✓ You tube Video(s) ✓ Articles/papers

Third part: FINANCIAL MANAGEMENT

Lesson N.	7
Lesson title	SHORT-TERM FINANCING AND CASH MANAGEMENT
Duration	1h
Specific objectives	This lesson discusses short-term finance, which is primarily concerned with the analysis of decisions that affect current assets and current liabilities; specific attention is paid to liquidity. First, the lesson introduces the basic elements of short-term financial decisions: the net working capital, frequently associated with short-term financial decision making, is presented and described; alternative short-term financial policies are identified and illustrated; the basic elements in a short-term financial plan are described. Then the chapter focuses on how firms should manage cash, recalling that the basic objective of cash management is to keep the investment in cash as low as possible while still keeping the firm operating efficiently and effectively.

Topics	Cash and Net Working Capital; Cash Budgeting; Short-term Financial Planning; Holding Cash; Cash Collection and Concentration; Investing Idle Cash
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	✓ Video Lesson(s) ✓ Virtual classroom/ web-streaming conference (if any) ✓ Lecture note ✓ You tube Video(s) ✓ Articles/papers

Lesson N.	8
Lesson title	INTERNATIONAL CASH MANAGEMENT
Duration	1h
Specific objectives	This lesson explains logics and techniques to optimize cash flows and investments of excess cash in a multinational company (MNC). The lesson aims to illustrate why, in an international perspective, cash management is very complex, by recalling the role and influence of specific factors: company-related characteristics; government restrictions; characteristics of banking systems; exchange rate fluctuations.
Topics	Cash Flow Analysis; Centralized Cash Management; Techniques to optimize cash flows; Investing Excess Cash
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	✓ Video Lesson(s) ✓ Virtual classroom/ web-streaming conference (if any) ✓ Lecture note ✓ You tube Video(s) ✓ Articles/papers

Lesson N.	9
Lesson title	RISK MANAGEMENT
Duration	1h
Specific objectives	ng their risk profile. The lesson illustrates costs and benefits of insurance policies and hedging strategies

	through financial markets.
Topics	Insurance; Commodity Price Risk; Exchange Rate Risk; Interest Rate Risk
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	✓ Video Lesson(s) ✓ Virtual classroom/ web-streaming conference (if any) ✓ Lecture note ✓ You tube Video(s) ✓ Articles/papers

Fourth part: SPECIAL TOPICS

Lesson N.	10
Lesson title	FOREIGN DIRECT INVESTMENTS (FDI)
Duration	1h
Specific objectives	This lesson focuses on multinational corporations (MNCs) and on how they manage long-term assets, by explaining that international investments face a much higher degree of financial complexity, and of political, economic, and regulatory risks. The lesson examines the problem of valuing such investments and illustrates the relevance of country risk.
Topics	Motives for FDI; Benefits of international diversification; Diversification analysis; Host Governments policies;
In presence activity	lecture video presentation, individual problem solving activities, in group interactive discussion
Distance learning type of learning object /task	✓ Video Lesson(s) ✓ Virtual classroom/ web-streaming conference (if any) ✓ Lecture note ✓ You tube Video(s) ✓ Articles/papers

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	/
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27/09/2021	1	/
31/05/2022	2	Updated version

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Table of Contents

1. Module details*

Module Title	Asset Pricing and Portfolio Management
Total hours	137 hours
In presence activities /lecturers	29 hours
Distance learning material	63 hours
Individual study (individual study supported by case studies, exercises/formative assessment, web references, individual project work etc.)	46 hours
ECTS**	5.5
Summative evaluation	Essay type of test, Case Studies, Research, Output, Critique Paper, Problem Solving, Self-assessment test

**The syllabus of the TRUST Master is structured according to the European Credit Transfer System (ECTS). The Master delivering is then managed by each university at international level according to the national /local regulations on the accreditation requirements.*
***EU commission ECTS credits system: 25 hours = 1 ECTS*

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
Specific objectives	Identify the big data definition. Understand the big data.
Topics	+ Definition and concepts of big data. + Applications of big data in different sectors.
In presence activity	Instructor presents the key concepts and asks students to work in group to discuss the applications 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

Lesson N.	2
Lesson title	Development and challenges of big data
Specific objectives	Provide the knowledge on the development and challenges of the big data.
Topics	+ The development of the big data. + Challenges of big data.
In presence activity	Instructor presents development and challenges of big data.
Distance learning type of learning object /task	• Virtual classroom/ web-streaming conference • Lecture note • Individual report

Lesson N.	3
Lesson title	Big data sources
Specific objectives	+ Explain the sources of the big data + Describe some examples from the industry
Topics	+ People to people communications + People to machine communications + Machine to machine communications
In presence activity	Instructor presents the three major sources of the big data. Students discuss examples from the industry.
Distance learning type of learning object /task	• Audio/Video Lesson • Virtual classroom/ web-streaming conference • Lecture note

	• Self-evaluation test

Lesson N.	4
Lesson title	Applications of big data
Specific objectives	+ Provide the knowledge on the applications of big data. + Describe examples of big data in finance
Topics	+ Applications of big data. + Financial industry examples of big data.
In presence activity	+ Instructor presents and discusses the applications of big data. + Students discuss the uses and examples in the financial sector.
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	5
Lesson title	Big data architecture
Specific objectives	+ Provide the knowledge on the variety of architectures for Big Data ecosystem and layers of technologies. + Discuss how leading organizations are architecting Big Data solutions.
Topics	+ Standard big data architecture + Big data architecture examples
In presence activity	+ Instructor introduces the big data architecture and examples. + Students work in groups to find the architectures from other big tech corps.

Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	6
Lesson title	Distributed computing using Hadoop
Duration	1 hour
Specific objectives	+ Provide the knowledge on the Apache Hadoop distributed computing framework.
Topics	+ Apache Hadoop distributed computing framework
In presence activity	+ Instructor explains the Hadoop computing framework. + Students discuss the applications and disadvantages/advantages of the framework.
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	7
Lesson title	Parallel processing with MapReduce
Duration	1 hour
Specific objectives	+ Provide the knowledge on parallel processing. + Explain the needs of MapReduce as a parallel processing system.
Topics	+ Needs for parallel processing for big data + MapReduce processing paradigm.
In presence activity	+ Instructor explains the Hadoop computing framework.

	+ Students discuss the applications and disadvantages/advantages of the framework.
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

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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	
Deliverable number and name	MASTER IN FINTECH AND DIGITAL INNOVATION - MODULE SYLLABUS -
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Issue date	Version	Comments
27/09/2021	1	/
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Table of Contents

1. Module details*

Module Title	FINANCIAL ECONOMETRICS IN PYTHON
Total hours	100 hours
In presence activities /lecturers	30 hours
Distance learning material	37 hours
Individual study (individual study supported by case studies, exercises/formative assessment, web references, individual project work etc.)	33 hours
ECTS**	4
Summative evaluation	Essay type of test, Case Studies, Research, Output, Critique Paper, Problem Solving, Self-assessment test

**The syllabus of the TRUST Master is structured according to the European Credit Transfer System (ECTS). The Master delivering is then managed by each university at international level according to the national /local regulations on the accreditation requirements.*

***EU commission ECTS credits system: 25 hours = 1 ECTS*

2. Module description

This course builds on the introductory module and introduces basic programming in Python to perform statistical analysis. 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) :

- *Learn the basics of Python*
- *apply financial econometrics methods using python*
- *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 Python
Specific objectives	Learners should be able to write simple program using r/python by importing data and library, and do basic statistical analysis for data visualization
Topics	• Introduction to Python • Selection Program Structure • Iterative/Looping Control Structure • Function • Arrays, List, and Matrices

	• Random Variables and Distribution • Models of Distribution • Trading Strategy
In presence activity	programming demonstration lecture discussion programming exercises
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers • Case Study

Lesson N.	2
Lesson title	Optimal Asset Allocation (Mean Variance and Safety-First Models)
Specific objectives	To develop optimization models for asset allocation in python and come up with a research paper
Topics	• Basic Framework of Portfolio Selection • Introduction to Mean-Variance Model • Introduction to Safety-First Model • Mean Variance Model in Python • Safety-First Model in Python • Project Topic Discussion
In presence activity	programming demonstration lecture discussion programming exercises individual / group consultation
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

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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	
Deliverable number and name	MASTER IN FINTECH AND DIGITAL INNOVATION - MODULE SYLLABUS -
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Author	Dragana Makajić-Nikolić, Marija Kuzmanović (UB)
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27/09/2021	1	/
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1. Module details*

Module Title	Risk Analysis and Quantitative Asset Allocation
Total hours	139 hours
In presence activities /lecturers	25 hours
Distance learning material	67 hours
Individual study (individual study supported by case studies, exercises/formative assessment, web references, individual project work etc.)	46 hours
ECTS**	5.5
Summative evaluation	Essay type of test, Case Studies, Research, Output, Critique Paper, Problem Solving, Self-assessment test

**The syllabus of the TRUST Master is structured according to the European Credit Transfer System (ECTS). The Master delivering is then managed by each university at international level according to the national /local regulations on the accreditation requirements.*
***EU commission ECTS credits system: 25 hours = 1 ECTS*

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 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).
b. Demonstrates a critical understanding of the range of digital solutions in monetary systems (e.g. digital finance, InsurTech, etc.).

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
Specific objectives	• To introduce the concept and types of risk, with a focus on financial risk and its categories. • To provide core concepts, practice and benefits of risk management.

	• To explain main phases of risk management process. • To explain main concepts of risk assessment.
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 (theoretical) • Lecture discussion (in group)
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	2
Lesson title	Fundamentals of asset allocation
Specific objectives	• To define assets. • To specify the asset management objectives. • To present the asset classes. • To discuss the approaches to asset allocation. • To identify the asset risk and return. • To specify the types of asset risk.
Topics	• Asset Management Objectives • Asset Classes • Approaches to Asset Allocation • Sources of Asset Risk and Return • Types of Asset Risk
In presence activity	• Lectures (theoretical) • Lecture discussion (in group)
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	3
Lesson title	Strategic, Tactical, and Dynamic Asset Allocation
Specific objectives	• To define the asset allocation approaches. • To present examples of the asset allocation approaches.
Topics	• Strategic Asset Allocation • Tactical Asset Allocation • Dynamic Asset Allocation
In presence activity	• Lectures (theoretical) • Lecture discussion (in group) • Case Study (in group)
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	4
Lesson title	Investment Objectives and Benchmark Selection
Specific objectives	• To discuss the investment policy statement. • To understand the four components that must be present in the investment policy statement. • To explain the additional components of investment policy statement. • To determine how to choose a benchmark that must be consistent with the investment policy statement.
Topics	• Investment Policy Statement • Benchmark Selection
In presence activity	• Lectures (theoretical) • Lecture discussion (in group)
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	5
Lesson title	Traditional Asset Allocation Techniques
Specific objectives	• To explain 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 (theoretical) • Lecture discussion (in group)
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	6
Lesson title	Measuring Risk
Specific objectives	• To explain risk measures based on historical data. • To provide 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
In presence activity	• Lectures (theoretical) • Lecture discussion (in group)
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note

	• You tube Video(s) • Articles/papers

Lesson N.	7
Lesson title	Estimating Model Parameters
Specific objectives	• To introduce the Capital Asset Pricing Model and Factor models • To explain process of estimation of inputs for a quantitative risk analysis and asset allocation models • To estimate model parameters using software tools.
Topics	• The Capital Asset Pricing Model • Factor Models • Volatility and Correlation • Return Distributions (Risk Characterization)
In presence activity	• Lectures (theoretical, practical) • Lecture discussion (individual) • Exercises (practical)
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	8
Lesson title	Modern portfolio theory - Markowitz Model
Specific objectives	• To provide basics about portfolio optimization • To introduce concept of optimization strategy • To discuss Markowitz optimization in practice
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 (theoretical & practical) • Lecture discussion (in group) • Problems solving (practical)
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	9
Lesson title	Risk-Based Approaches to Asset Allocation (1) - Risk Parity
Specific objectives	• To provide the core concepts of risk parity strategies. • To explain key features of bonds • To illustrate how to valuate bonds
Topics	• The Theoretical Background and Argument for Risk Parity • Bonds and Their Valuation
In presence activity	• Lectures (theoretical & practical) • Lecture discussion (in group) • Exercises (practical)
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	10
Lesson title	Risk-Based Approaches to Asset Allocation (2) - Risk Parity
Specific objectives	• To provide key features of common stocks • To illustrate how to determine common stock value
Topics	• Stocks and their Valuation • Features of common stocks • Determining common stock values

	• Preferred stock
In presence activity	• Lectures (theoretical & practical) • Lecture discussion (in group) • Exercises (practical)
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	11
Lesson title	Risk-Based Approaches to Asset Allocation (3)
Specific objectives	• To introduce the concept and characteristics of Foreign Exchange Market (FOREX) • To explain how to evaluate Interest rate parity
Topics	• Foreign Exchange Market (FOREX) • Cross rate and exchange rate risk • International Monetary System • Interest rate parity
In presence activity	• Lectures (theoretical & practical) • Lecture discussion (in group) • Exercises (practical)
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	12
Lesson title	Value-at-Risk (VaR)
Specific objectives	• To provide the core concepts of VaR. • To present different approaches to estimate VaR. • To explain how to determine the attribution of

	portfolio VaR to individual asset.
Topics	• VaR Cocept • Variance–Covariance VaR • Simulation of VaR • VaR Along the Efficient Frontier* • Marginal Contributions to VaR
In presence activity	• Lectures (theoretical & practical) • Lecture discussion (in group) • Exercises (practical)
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	13
Lesson title	CVaR and EVT
Specific objectives	• To provide students the knowledge about extensions of Value-at-Risk (CVaR and Extreme Value Theory) • To show how to apply Extreme Value Theory to estimate VaR and CVaR of a portfolio
Topics	• Conditional VaR (CVaR) • Extreme Value Theory (EVT)
In presence activity	• Lectures (theoretical & practical) • Lecture discussion (in group) • Exercises (practical)
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	14
Lesson title	Optimal Hedging
Specific objectives	• To provide the knowledge on advanced derivative pricing methodology. • Apply quantitative methods to underwrite financial assets.
Topics	• Dynamic Hedging and Replication • Wealth Change Equations • Optimal Hedging Monte Carlo Method
In presence activity	• Lectures (theoretical & practical) • Lecture discussion (in group) • Exercises (practical)
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	15
Lesson title	Tracking Error and Information Ratio
Specific objectives	• To provide knowledge about errors in parameters estimation. • To examine portfolio tracking errors
Topics	• Absolute vs. relative risk measures • Decomposing tracking error • Information Ratio • Active Management Value Added
In presence activity	• Lectures (theoretical) • Lecture discussion (in group)
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

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 -

DELIVERABLE DESCRIPTION	
Deliverable number and name	MASTER IN FINTECH AND DIGITAL INNOVATION
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Work Package	WP2
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Approved by	All partners
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Document history

Issue date	Version	Comments
27/09/2021	1	
31/05/2022	2	Updated version

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Table of Contents

1. Module details*

Module Title	Risk Analysis and Quantitative Asset Allocation
Total hours	137 hours
In presence activities /lecturers	24 hours
Distance learning material	67 hours
Individual study (individual study supported by case studies, exercises/formative assessment, web references, individual project work etc.)	46 hours
ECTS**	5.5
Summative evaluation	Essay type of test, Case Studies, Research, Output, Critique Paper, Problem Solving, Self-assessment test

**The syllabus of the TRUST Master is structured according to the European Credit Transfer System (ECTS). The Master delivering is then managed by each university at international level according to the national /local regulations on the accreditation requirements.*
***EU commission ECTS credits system: 25 hours = 1 ECTS*

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	Introduction to business valuation
Specific objectives	Appreciate the role of financial reporting in the functioning of capital markets Understand the links between business activities and financial reports Explain why accounting systems can influence the quality of financial statements List other forms of communication used to communicate with external investors Discuss the framework for business analysis using financial statements

Topics	The role of financial reporting in capital markets From business activities to financial statements Influence of accounting system on information quality Alternative forms of communication with investors From financial statements to business valuation
In presence activity	Lectures Discussion
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	2
Lesson title	Strategy analysis
Duration	8 hours (4 hours of lectures in presence, 1 hours of lectures of distance learning and 3 hours of self-study)
Specific objectives	Appreciate the importance of strategy analysis Discuss and apply industry analysis Discuss and apply competitive strategy analysis Discuss and apply corporate strategy analysis
Topics	Industry Analysis Competitive Analysis Corporate Strategy Analysis
In presence activity	Lectures Discussion
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	3

Lesson title	Accounting Analysis
Duration	8 hours (4 hours of lecture in presence, 1 hours of distance learning and 12 hours of self – study)
Specific objectives	Discuss factors that affect accounting quality Outline steps in accounting analysis Practise recasting financial statements into standardized templates Understand possible pitfalls in accounting analysis Appraise the value of accounting data and accounting analysis
Topics	Accounting analysis objective Factors influencing accounting quality Steps in accounting analysis Recasting financial statements Accounting analysis pitfalls Value of accounting data and accounting analysis
In presence activity	Lectures Discussion Problem solving
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	4.
Lesson title	Financial analysis
Duration	8 hours (3 hours of lectures in presence, 2 hours of distance learning and 3 hours of self-study)
Specific objectives	Provide the knowledge in using financial analysis to assess the performance of a firm. Understand two principal tools of financial analysis: ratio analysis and cash flow analysis.
Topics	Ratio analysis

	Cash flow analysis
In presence activity	Problem-solving Discussion
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	5.
Lesson title	Forecasting
Duration	8 hours (4 hours of lectures in presence, 1 hours of distance learning and 3 hours of self-study)
Specific objectives	Provide an approach to structuring the forecast, offer information useful in getting started, explore the relationship between the other analytical steps and forecasting, and give detailed steps to forecast earnings, balance sheet data, and cash flows.
Topics	The overall structure of the forecast Performance behavior: A starting point Forecasting assumptions Sensitivity analysis
In presence activity	Problem-solving Discussion
Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers

Lesson N.	6.
Lesson title	Valuation
Duration	16 hours (5 hours of lectures in presence, 5 hours of distance learning and 6 hours of self-study)

Specific objectives	Provide students some basic concepts about valuation from the shareholders' point of view. Introduce different approaches to value a company in general. Comparing between different valuation methods
Topics	Fundamental concepts of valuation Methods of valuation – The discounted cash flow model – The discounted abnormal earnings model – The discounted abnormal earnings growth model – Valuation using price multiples – Shortcut forms of earnings-based valuation Comparing different valuation methods
In presence activity	Problem-solving Discussion
Distance learning type of learning object /task	● Audio/Video Lesson ● Virtual classroom/ web-streaming conference ● Lecture note ● Self-evaluation test

Lesson N.	7.
Lesson title	Valuation of Fintech Companies
Duration	16 hours (10 hours of lectures in presence, 6 hours of self-study)
Specific objectives	Provide the students the overview of Fintech industry; Present different methodologies of Fintech valuation; Show the students how to apply different methodologies to evaluate a specific Fintech company.
Topics	Overview of Fintech Valuation Methodology for Fintech companies Fintech valuation: Case of Nexi
In presence activity	Problem-solving Discussion

Distance learning type of learning object /task	• Video Lesson(s) • Virtual classroom/ web-streaming conference (if any) • Lecture note • You tube Video(s) • Articles/papers/ case study

Lesson N.	8.
Lesson title	Business Valuation Project and Student Presentation
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.