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

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

MASTER IN FINTECH AND DIGITAL INNOVATION

- MODULE SYLLABUS -

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DELIVERABLE DESCRIPTION	
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1. Module details

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

2. Module description

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

3. Learning Outcomes

The course overall learning outcomes are:

Knowledge and Understanding:

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

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

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

Application and Problem-Solving Abilities:

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

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

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

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

5. Module lessons

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

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

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

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