



**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

The European Commission support for the production of this publication does not constitute endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

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

#### Document history

Issue date	Version	Comments

#### Disclaimer

This document contains the description of the TRUST project work and products. Certain parts of it might be under partners' Intellectual Property Right (IPR) rules therefore, prior to its use please contact the consortium leader for approval.

In case you believe that this document harms in any way IPR held by you as a person or as a representative of an entity, please do notify us immediately.

The authors of this document have taken any available measure in order for its content to be accurate, consistent and lawful. However, neither the project consortium as a whole nor the individual partners that implicitly or explicitly participated in the creation and publication of this document hold any sort of responsibility that might occur as a result of using its content.



## Table of Contents

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

## 1. Module details

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

## 2. Module description

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

## 3. Learning Outcomes

The course overall learning outcomes are:

Knowledge and Understanding:

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

Application and Problem-Solving Abilities:

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

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

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

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

## 5. Module lessons

<b>Lesson N.</b>	1
<b>Lesson title</b>	Big data introduction
<b>Duration</b>	28 hours (7 hours contact hours)
<b>Specific objectives</b>	Identify the big data definition. Understand the big data and its challenges/issues: biased/discrimination, privacy, etc.
<b>Topics</b>	+ Definition and concepts of big data/ AI/ Machine Learning. + Applications of big data in different sectors. + Critical role of big data in the financial areas. + Issues of big data.
<b>In presence activity</b>	Instructor presents the key concepts and asks students to work in a group to discuss the applications/issues of big data. Students are required to search for the Cambridge Analytica data scandal to discuss.
<b>Distance learning type of learning object /task</b>	<ul style="list-style-type: none"> <li>● Virtual classroom/ web-streaming conference</li> <li>● Lecture note</li> <li>● Individual report</li> </ul>

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



<b>Lesson N.</b>	2
<b>Lesson title</b>	Handling data
<b>Duration</b>	36 hours (9 hours contact hours)
<b>Specific objectives</b>	<ul style="list-style-type: none"> <li>+ Understand the data format and styles.</li> <li>+ Design how to manage data.</li> <li>+ Describe the text processing in terms of finance.</li> <li>+ Identify the representation of data.</li> </ul>
<b>Topics</b>	<ul style="list-style-type: none"> <li>+ Classify the data (Structured and unstructured data) and file formats</li> <li>+ Manage the database by SQL.</li> <li>+ Define concepts of text processing and applications.</li> <li>+ Representing data.</li> </ul>
<b>In presence activity</b>	<p>Instructor presents the key theoretical concepts and explains the lesson.</p> <p>Students work in pairs to discuss the text processing application in financial aspects.</p>

<p><b>Distance learning type of learning object /task</b></p>	<ul style="list-style-type: none"> <li>● Audio/Video Lesson</li> <li>● Virtual classroom/ web-streaming conference</li> <li>● Lecture note</li> <li>● Self-evaluation test</li> </ul>
<p><b>Other supporting material</b></p>	<p>Salahaldin Juba and Andrey Volkov (2017). Learning PostgreSQL 10: A beginner’s guide to building high-performance PostgreSQL data solutions. 2<sup>nd</sup> edition. Packt Publishing. ISBN : 1788392019</p> <p>Silberzahn, R., et al. (2018) Many analysts, one data set: mining transparently how variations in analytic choices affect results. <i>Advances in Methods and Practices in Psychological Science</i>, <a href="https://doi.org/10.1177/2515245917747646">https://doi.org/10.1177/2515245917747646</a></p>

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

	<p>(suggest using the SAS enterprises in Python to prepare/R or Python).</p> <p>+ Students are required to present a group assignment on how to employ the data cluster to build a model for asset management/portfolio management.</p>
<b>Distance learning type of learning object /task</b>	<ul style="list-style-type: none"> <li>● Audio/Video Lesson</li> <li>● Virtual classroom/ web-streaming conference</li> <li>● Lecture note</li> <li>● Self-evaluation test</li> <li>● Group assignments.</li> </ul>
<b>Other supporting material</b>	<p>Irene Aldridge and Marco Avellaneda (2021) Big data science in finance. Wiley &amp; Son. ISBN 9781119602996</p> <p>Vignesh Prajapati (2013). Big data Analytics with A and Hadoop. Packt Publishing. ISBN 978-1-78216-328-2</p>

<b>Lesson N.</b>	4
<b>Lesson title</b>	Application of big data in mortgages
<b>Duration</b>	14 hours (3.5 contact hours)
<b>Specific objectives</b>	<p>+ Understand the process of big data and its application.</p> <p>+ Be able to build a model to analyse.</p>
<b>Topics</b>	+ Practice the analysis of loan performance on mortgages
<b>In presence activity</b>	<p>+ Instructor provides the tools/explanation to access the Data Dynamics (from Fannie Mae).</p> <p>+ Students present how they handle the data sets and process for the specified purpose.</p>
<b>Distance learning type of learning object /task</b>	<ul style="list-style-type: none"> <li>● Video example</li> <li>● Lecture note</li> <li>● Group presentation</li> </ul>





**Other supporting material**

Iain L. J. Brown (2014). Developing Credit Risk Models Using SAS Enterprise Miner and SAS/STAT: Theory and Application. Cary, NC: SAS Institute Inc. ISBN 978-1-62959-488-0

Yves Hilpisch (2015). Python for finance: analyze big financial data. O'Reilly. ISBN: 978-1-491-94528-5