## Advanced risk management

**Academic Year:  ( 2021 / 2022 )**                                **Review date: 18-06-2021**

**Department assigned to the subject:**

**Coordinating teacher: PEÑA SANCHEZ DE RIVERA, JUAN IGNACIO**

**Type: Electives  ECTS Credits : 3.0**

**Year : 1 Semester : 2**

### REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Target Audience: This course is useful for any student in the master (the student could be an Economics, Engineering, Math, Physics or from Business Administration bachelor). The courses of Computer Science for Finance(Matlab), Financial Markets, Financial Derivatives, Risk Management and Investment should have been completed previously. The empirical exercises will be done using Excel and Matlab.

Professors:
Ana Castañeda. CEO - Intermoney Valora Consulting.
Olivier Tinguely. Head of Risk - Intermoney Valora Consulting.

### OBJECTIVES

This course is designed to train the participants in managing financial risks -specially credit risk and operational risk, using advanced methods. The course starts by introducing the main concepts of credit risk and its background. Then the most important credit risk measurement procedures and models are presented, starting by the traditional approaches to continue with the more recent techniques. Later the course addresses how credit risk is transferred and hedged, and the financial instruments and techniques required to do so. Finally, the course deals with counterparty risk and operational risk, whose importance and presence in the financial system at every level (identification, measurement, regulation, etc.) has increased notably since the crisis of 2008.

### DESCRIPTION OF CONTENTS: PROGRAMME

Chapter 1: Credit Concepts and Background
-Meaning and role of credit
-Credit markets and participants
-Credit risk definition. Obligor credit risk and portfolio credit risk
-Credit risk measurement and management
-Credit risk and the 2008 crisis

Chapter 2: Credit Risk Measurement and Modelling
-The management of credit risk in private entities:
 --The credit risk in the management of a financial institution. The regulatory framework
 --The credit risk in non-financial institutions
-Traditional approaches:
 --Methods:
  ---Credit scoring
  ---Rating systems
--Applications:
  ---Retail credit risk management
  ---Commercial credit risk management
--New approaches:
  ---Structural models
  ---Reduced form models
  ---Credit VaR
  ---Applications: Credit risk in investment portfolios

Chapter 3: Transferring Credit Risk

-Introduction to hedging credit risk
-Credit derivatives:
 --Single name CDS
 --Portfolio products
-Credit risk securitization

Chapter 4: Counterparty Risk
-Counterparty Risk. Definition.
-CVA and DVA
-FVA

Chapter 5: Operational Risk

## LEARNING ACTIVITIES AND METHODOLOGY

The Professor will present the main theoretical concepts using Power Point presentations. These concepts will be illustrated by case studies and exercises.
For each topic, the students will have to solve exercises in order to learn the main concepts. Additionally, the students will work in teams to solve 2 practical cases. These cases will be based on real situations.
Through these cases, a double objective is pursued: (i), to learn to collaborate and to organize a teamwork; and (ii), to apply the concepts to practical situations. For each case, the students must present a report using a structure similar to an academic paper.

## ASSESSMENT SYSTEM

Students will take a final examination. The final examination will count 60 points; the exercises (problems and cases) and class participation will count for 40 points.

"Students that do not meet the minimum passing grade should retake the subject. If this was the case, the above grade criteria also apply".

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| **% end-of-term-examination:** | 60 |
| **% of continuous assessment (assigments, laboratory, practicals…):** | 40 |

## BASIC BIBLIOGRAPHY

 - Anderson, Raymond he Credit Scoring Toolkit. Theory and Practice for Retail Credit Risk Management and Decision Automation, Oxford University Press, 2007
 - Bolder David J. Credit-Risk Modelling: Theoretical Foundations, Diagnostic Tools, Practical Examples, and Numerical Recipes in Python, Springer, 2018
 - Ciby Joseph Advanced Credit Risk Analysis and Management, Wiley, 2013

 - Crouhy, M. , D. Galai and R. Mark   The Essentials of Risk Management, Wiley, 2014

 - Crouhy, Michel, Galai Dan and Mark Robert The Essentials of Risk Management, Mc Graw Hill, Second Edition, 2014
 - John Hull Options, Futures, and Other Derivatives, Pearson Prentice Hall, 2011

 - Jorion, P.  Financial Risk Manager Handbook,  Wiley. , (2011) . 6th Edition