



UNIVERSITÀ DI PAVIA

Anno Accademico 2018/2019

MATHEMATICS FOR BUSINESS	
Enrollment year	2018/2019
Academic year	2018/2019
Regulations	DM270
Academic discipline	SECS-S/06 (MATHEMATICS FOR ECONOMICS, ACTUARIAL STUDIES AND FINANCE)
Department	DEPARTMENT OF ECONOMICS AND MANAGEMENT
Course	BUSINESS ADMINISTRATION AND LAW
Curriculum	PERCORSO COMUNE
Year of study	1°
Period	1st semester (24/09/2018 - 21/12/2018)
ECTS	6
Lesson hours	44 lesson hours
Language	Italian
Activity type	WRITTEN TEST
Teacher	MOLHO ELENA (titolare) - 1 ECTS HITAJ ASMERILDA - 5 ECTS
Prerequisites	Calculus 1
Learning outcomes	The course aims to illustrate the characteristics of the main financial instruments (bonds, equities, forward, futures and options) and the related evaluation process (price formation). Particular attention is also given to the actuarial field; forecasting the probability of death and survival, providing the necessary tools to price an insurance policy (life and death insurance) and calculation of the mathematical reserve for an insurance company.
Course contents	1) Business valuation tools Discounting and capitalization schemes Use of information extracted from accounting documents

	2) Valuation of financial projects Net Present Value, Internal Rate of Return and Pay-back Period Profitability indicators: - related ROE, ROA and ROC - absolute EVA (Economic Value Added) 3) Bond securities Valuation of fixed coupon and variable coupon securities Duration and convexity Financial immunization theorems 4) Models for the evaluation of a company's equity: Dividend Discounting Model Free Cash Flow approach in the absence of dividends 5) Derivatives: employment in risk management and evaluation Forward and future contracts European options and American options Black & Scholes model for evaluating options Options strategies in risk management 6) Elements of actuarial mathematics Tables of mortality and expected life span Calculation of premiums and reserves in insurance contracts Pension plans and pension fund characteristics.
Teaching methods	Formal and interactive lectures. During the course exercises are planned and excel is used to solve specific cases of portfolio immunization (Asset liability management), option pricing and assessment of life insurance policies.
Reccomended or required readings	Stefani, Torriero and Zambruno (2011), Elementi di Matematica Finanziaria e cenni di Programmazione Lineare, G. Giappicchelli, Quarta Edizione John Hull (2012) Options, Futures and Other Derivatives, Prentice Hall, 8th Edition Bodie, Z., Kane, A. and Marcus, A.J., 2012. Essentials of Investments 9th Edition. McGraw-Hill. Olivieri and Pitacco (2015) Introduction to Insurance Mathematics, Springer, 2nd Edition
Assessment methods	The exam is written containing both theory questions and exercises.
Further information	
Sustainable development goals - Agenda 2030	\$lbl_legenda_sviluppo_sostenibile