Stampare su carta intestata del CdS

General information		
Academic subject	Financial Mathematics	
Degree course	Statistical Sciences	
Academic Year	II year	
European Credit Transfer and Accumulation System (ECTS)		6
Language	Italian	
Academic calendar (starting and ending date)		I semester
Attendance	No	

Professor/ Lecturer	
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Department and address	Economics and Finance
Virtual headquarters	
Tutoring (time and day)	Thursday, 11.30

Syllabus	
Learning Objectives	The course aims to provide the basic notions necessary for understanding the functioning of elementary and complex financial transactions, of activities and projects of an economic-financial nature. For elementary financial transactions the basic definitions of interest and discount rates, amount, present value and properties and financial regimes will be provided. In the context of complex financial transactions, the course aims to provide the skills necessary for the assessment of financial income in a certain context, to understand the various methods of repaying a loan and the assessment of the convenience of a business project. In addition, the course aims to explain the relationships between interest rates and the prices of bonds and finally the dynamics of a portfolio made up of equities.
Course prerequisites	Basic notions of calculus and linear algebra. Basic notions of economics.
Contents	**FIRST CFU** Fundamental Definitions: Interest and Amount. Discount and present value. Relationship between the fundamental financial quantities. The main financial regimes: Simple interest (and rational discount). Compound interest (and discount). Equivalent rates. The nominal interest rate. The instant rate. Theory of financial laws: The severability. **SECOND CFU** Make certain: First definitions. Constant temporary and perpetual annuities. Present and total value of an immediate, deferred, temporary, unitary annuity. Loan amortization: The repayment plan. The residual debt as the present value of the annuities still to be paid. French depreciation. Italian depreciation. American depreciation. **THIRD CFU** The valuation of certain financial transactions: The R.E.A. The criterion of the T.I.R. The T.A.E.G. and the T.A.N. The price of bonds: Generalities on bond loans. Price and yield of bonds repayable at maturity.

	FOURTH CFU The term structure of interest rates: Relation between forward rates and spot rates. The absence of arbitrage opportunities. **FIFTH CFU** The average financial duration. The average financial duration as a measure of volatility. The convexity of a financial transaction. Principles of Financial Immunization. **SIXTH CFU** The Portfolio Theory: Risk-Free and Risk-Free Investments. The case of two titles.
Books and bibliography	• Fabrizio Cacciafesta, *Matematica Finanziaria (classica e moderna)* per i corsi triennali, Giappichelli Editore, Torino, 2013, ISBN 978•88•3488913•8 • Lecture notes by the teacher
Additional materials	

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
42			
ECTS			
6			
Teaching strategy			
	Lectures and exercises related to the topics covered in class. At the end of each CFU the exercises will consist in carrying out the examination tests of the previous sessions.		
Expected learning outcomes			
Knowledge and understanding on:	The course provides students with the knowledge and analytical tools needed to understand the functioning of financial markets and to analyze economic and financial phenomena.		
Applying knowledge and understanding on:	The student must be able to interpret the main economic and financial phenomena. In particular he/she must be able to construct simple models to formulate and solve basic problems of modern finance on all the topics included in the course program.		
Soft skills	• *Making informed judgments and choices* The student must be able to independently assess the necessary information, to conduct surveys and to set up quantitative analysis of financial phenomena. • *Communicating knowledge and understanding* The student must be able to communicate effectively on economic and financial issues, using an appropriate technical language. The ability to communicate on a multidisciplinary level on economic-financial and mathematical-statistical topics is, in this respect, the main target of the course.		

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	• *Capacities to continue learning* The student must acquire a significant analytical ability and a well-founded quantitative survey method to be able to deal with subsequent teachings.

Assessment and feedback	
Methods of assessment	
Evaluation criteria	• *Knowledge and understanding* The course is in line with the general objective of the course of study to provide economic skills and mathematical statistical techniques for an adequate understanding of the economic system and the functioning of financial markets. • *Applying knowledge and understanding* The course, in particular, aims at equipping students with the technical tools necessary for understanding financial phenomena. • *Autonomy of judgment* To learn the basic concepts and tools of modern finance; To know how to formulate and solve basic problems of modern finance. • *Communicating knowledge and understanding* The student is expected to assimilate the fundamental notions of understanding the functioning of financial markets and of analyzing economic-financial phenomena; to adequately know the main economic and financial phenomena; to be able to correctly set and solve basic problems of modern finance; to be able to communicate effectively on economic and financial issues, using an appropriate technical language. • *Communication skills* Learn the fundamental concepts and tools of modern finance; knowing how to formulate and solve basic problems of modern finance. • *Capacities to continue learning* The student must be able to face the subsequent teachings with a significant analytical ability and with a well-founded quantitative investigation method learned in this course.
Criteria for assessment and attribution of the final mark	The measurement of learning takes place through an exam test and the attribution of marks based on the knowledge and skills shown during the exam.
Additional information	