FACULTY OF **ECONOMICS**

DEGREE COURSE: **BUSINESS AND ECONOMICS BA**

SUBJECT: FINANCIAL MATHEMATICS

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OBJECTIVES

The first part of this course provides the basic elements for understanding classic financial mathematics, namely, compound amount formula and related concepts, present value and discount rates, effects of inflation on financial operations, duration indexes, Evaluation of financial operations under certainty.
The second part of this course introduces elementary notions for understanding Portfolio Theory, namely, mean-variance criterion, diversification and efficient frontier with risky assets, efficient portfolios and risk premium.

CONTENTS

1 Effective interest rate; discount factor; periodic interest rates.
2 Properties of Financial Laws.
3 Term Structure of Interest Rates
4 Weighted Average Maturity. Duration
5 Annuities: Immediate and Due; Present and Future Value; Perpetuity; Present Value.
6 Amortization of a loan: Italian Amortization (decreasing installments), French Amortization (constant installments).
Variable rates of interest.
7 Arithmetical Average Maturity. Mac Cauley Duration
8 Investments and Financing; Methods for Evaluation Investments: NPV (Net Present Value), and IRR (Internal Rate of Return). Break Point.
9 Effective APR, Annual Percentage Rate of Charge and Nominal APR.

10 Elements of Portfolio Theory; Efficient assets. Mean–variance efficient frontier. Efficient frontier with two and with *n* risky assets. Efficient portfolios with one risky asset and one risk-free. Diversification for risk reduction.

ASSESSMENT

Written exam: multiple choice and open questions.

RECOMMENDED TEXTBOOKS

- Bortot P., Magnani U., Olivieri G., Rossi F.A. and M. Torrigiani, "Financial Mathematics", Ed. Monduzzi, 2nd edition with exercises, 1998.