AF 2020

DEREE COLLEGE SYLLABUS FOR:

AF 2020 MATHEMATICS OF FINANCE-LEVEL 5 **UK CREDITS: 15**
Compulsory

(Updated Spring 2010)

PREREQUISITE: None

CATALOG DESCRIPTION: The presentation of various models and methods for calculation of Interest and its application in a variety of financial issues such as purchases on credit, loans, bonds, and investment evaluation.

RATIONALE: This course should prove useful in helping the student prepare to take advanced courses in accounting and finance. It introduces him or her to the application of mathematical models of interest, discount, and annuities in the fields of personal and business finance, investments, accounting and economics.

LEARNING OUTCOMES: As a result of taking this course, the student should be able to:

1. Apply mathematical models in solving problems of simple and compound interest and bank discount and examine the term structure of interest rates.
2. Apply the concepts of yield, risk, time value of money and calculate future and present values.
3. Use annuity models and prepare amortization and sinking fund schedules and comprehend the issue of perpetuity
4. Apply financial calculator and computer program (Excel) in solving basic problems in finance.

METHOD OF TEACHING AND LEARNING:

- Class lectures, interactive learning (class discussions) and practical problems solved in class.
- Student participation is expected during the presentation of problems.
- Office hours: students are encouraged to make full use of the office hours of their instructor, where they can ask questions, go over lecture material, and see their exam paper.
- Use of blackboard site where instructors post lecture notes, assignment instructions, timely announcements as well as additional resources.
- Exercises and primary source documents are assigned as homework, the solutions of which are reviewed in class.

ASSESSMENT:

Coursework - **formative**	0	Numerical problems
In-class 1-hour midterm examination - **summative**	40	Numerical problems
Final examination (2-hour, comprehensive) - **summative**	60	Numerical problems

The formative test aims to prepare students for the final examination.
The midterm examination tests Learning Outcomes 1 and 2.
The final examination tests Learning Outcomes 2, 3 and 4

INDICATIVE READING:

REQUIRED READING MATERIAL:
The Theory of Interest by Stephen G. Kellison (McGraw-Hill Edition)

Recommended Reading:
Mathematics for Management and Finance by Shao & Shao, 8th Edition (South Western)

Indicative Articles:
Methods of mathematical finance / Ioannis Karatzas, Steven E. Shreve. by Karatzas, Ioannis. New York : Springer, c1998. ISBN: 0387948392

SOFTWARE REQUIREMENTS:

- Microsoft Excel
- Financial Calculator: Texas Instruments BA II Plus or Hewlett Packard 10B II.

WWW RESOURCES: www.studyfinance.com

INDICATIVE CONTENT:

1. Measurement of interest
   - 1.1. Simple interest
   - 1.2. Compound Interest
   - 1.3. Effective rates of interest and discount
   - 1.4. Equations of value
2. Annuities
   - 2.1. Annuity-immediate
   - 2.2. Annuity-due
   - 2.3. Annuity values on any date
   - 2.4. Perpetuities
   - 2.5. More General Annuities
3. Amortization Schedules and Sinking Funds
   - 3.1. Calculating the outstanding loan balance
   - 3.2. Amortization Schedule
   - 3.3. Sinking Funds
4. Practical Applications
   - 4.1 Approximate methods
   - 4.2 Depreciation methods
   - 4.3 Capitalized costs
5. Term Structure of interest rates
   - 5.1. Yield Curves
   - 5.2 Spot rates
   - 5.1. Relationship with bond yields