



**NATIONAL UNIVERSITY OF ENGINEERING**  
**COLLEGE OF ENVIRONMENTAL ENGINEERING**  
**SANITARY ENGINEERING PROGRAM**

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**MA074 – FINANCIAL MATHEMATICS**

**I. GENERAL INFORMATION**

<b>CODE</b>	: MA074 Financial Mathematics
<b>SEMESTER</b>	: --
<b>CREDITS</b>	: 3
<b>HOURS PER WEEK</b>	: 4 (Theory, Practice)
<b>PREREQUISITES</b>	: AA221 Mathematics II
<b>CONDITION</b>	: Elective

**II. COURSE DESCRIPTION**

This course aims to channel the undergraduate student to develop mathematical models to interpret and solve the financial problems that often arise in the management of companies, investment agencies and entities of the banking and financial system.

**III. COURSE OUTCOMES**

At the end of the course students:

1. Analyze and evaluate financial transactions.
2. Have ability to apply financial knowledge into everyday life.

**IV. LEARNING UNITS**

**Chapter 1: Simple Interest**

Introduction. Simple interest. Time frame. Accurate Interest and Ordinary Interest. Commercial standard. Present value. Rode. Rate changes. Equations of value.

**Chapter 2: Compound Interest**

Introduction. Simple interest and compound interest. Rode. Current value. Amount with rate changes. Equations of value.

**Chapter 3: Discount**

Introduction. Rational discount. Simple rational discount. Rational compound discount. Bank discount. Simple bank discount. Composite bank discount. Commercial discounts. Unit trade discount. Successive commercial discount.

**Chapter 4: Fees**

Introduction. Nominal rate and proportional rate. Effective rates. Equivalent fees. Relationship between effective rate and equivalent rate. Equivalence between rational and bank rate. Active and passive tax. Compensatory interest rate. Moratorium interest rate. Legal interest rate. Rate of inflation. Real rate. Devaluation rate. Continuous capitalization rates.

**Chapter 5: Annuities**

Introduction. Amount of overdue annuities. Present value of past due annuities. Amount of an advance annuity. Present value of an anticipated annuity. Deferred Annuities. Annuities

at simple interest. Amount of an annuity at simple interest. Present value of a simple interest annuity.

### **Chapter 6: Perpetual Annuities**

Introduction. Present value of a perpetual annuity past due. Present value of an anticipated perpetual annuity.

### **Chapter 7: Gradients**

Introduction. Present value of annuities that vary in arithmetic progression. Present value of uniform gradients. Equivalences between uniform annuities and annuities that vary in arithmetic progression. Present value with annuities in geometric progression.

### **Chapter 8: Amortization**

Introduction. Amortization funds. Repayment fund table. Amortization. Amortization table. Net present value. Observations on the VAN method. Internal rate of return. Observations on the IRR method. Straight Depreciation. Summation method of digits. Method of reduction of balances.

## **V. METHODOLOGY**

The knowledge of the subject is acquired through the reasoned study of all the chapters of the course, as well as of the complementary didactic material that is made available to the students in class. In addition, students are required to carry out ongoing assessment and learning activities planned in the "evaluation activity schedule" and defined in the "evaluation system".

## **VI. GRADING SYSTEM**

This course uses the Evaluating System "G".

## **VII. BIBLIOGRAPHY**

1. Aching Guzman, Cesar  
Financial Mathematics, Money, Capital, 1st Edition  
CA Editions, Lima – Peru
2. Ayres, Jr. Frank  
Financial Mathematics  
McGraw Hill, Mexico