NAU NORTHERN ARIZONA UNIVERSITY

Course Title: MAT 462 Interest Theory For Actuarial Science
Term: Summer 2023
Instructor: TBA
Course Credit: 3
Mode of Instruction: Online

Course Description:

This course aims to provide students with the theory and applications of interest, or the time value of money. Topics include measurement of interest, annuities certain, yield rates, amortization schedules and sinking funds, bonds, and related securities. The main objective is to explore mathematical theory of interest with some applications to economics and finance.

Course Prerequisites:

MAT 137 Calculus II

Learning Outcomes:

By the end of the course, the student should be able to:

A. Gain insights into the basic concepts and theories of interest;

B. Write and solve time value of money equations;

C. Define and recognize the definitions of interest, annuities, perpetuities, and bonds;

D. Understand the role of theory of interest plays in the insurance and banking world;

E. Apply the concepts and theory of interest to solve financial problems in real life.

Course Material:

Richard James Wilders, *Financial Mathematics For Actuarial Science: The Theory of*

Interest, First Edition, CRC Press, 2020.

Evaluation:

- 2 Homework [10%]
- 2 Quizzes [20%]
- Term Paper [15%]
- Mid-term Exam [20%]
- Final Exam [35%]

Description of the Evaluation tasks:

Assignment/ Essay/ ... : During the term, students will be required to finish several evaluation tasks within due date. All the tasks are linked with specific course topics/outcomes and will adequately assess students' competence and learning outcomes. Students are encouraged to meet with instructor about these tasks at any point.

Mid-term/ Final Exams/ Quiz/... : There may be periodic quizzes given at the beginning of lecture sessions; the feedback from these quizzes will monitor the progress of the learners and help to set learning priorities. There will be mid-term exam/ final exam for the course. They are the basic criteria for the evaluation of students' learning outcomes and final grade.

Grading Policy:

Students are supposed to finish each online lecture. Prior to each class, students should finish the required readings. During the class time, students are encouraged to make use of all relevant online course resources and communicate with the instructor. Students' grades are accumulated based on the cumulative evaluations.

Students' letter grade will be assigned according to the following scale:

A+ 90-100	A 85-89	A- 80-84
B+ 77-79	B 73-76	B- 70-72
C+ 67-69	C 63-66	C- 60-62
D+ 57-59	D 53-56	D- 50-52
F < 50		

Academic Integrity:

Students must strictly adhere to the university's academic integrity rule; and all essays, exams and any other form of academic assignments must adhere to these rules. Any form of plagiarism, cheating, or misappropriation of materials will be considered a violation of academic integrity and will be punishable by the university.

Withdrawal from the Course(s):

Students will be able to apply for a transfer or withdrawal within 3 days of the starting date of the course. If a withdrawal is applied for within 3 working days, the tuition fee will be fully refunded. After 3 days, the tuition fee will not be refunded. If a withdrawal is applied for in the first two weeks, it will be recorded as W (Withdraw) on the course transcript. After this initial two-week period, the class will be recorded as F (Fail).

Tentative Schedule:

1	Measuring Interest
2	Measuring Interest
3	Simple Interest Compound Interest
4	Solving Problems in Interest **Homework 1**
5	Equations of Value at any Time

6	Annuities
7	Annuities (Cont.)
8	Amortization Schedules **Quiz 1**
9	Sinking Funds
10	Yield Rates
11	Bonds
12	Pricing a Bond
13	**Mid-term Exam**
14	The Term Structure of Interest
15	Exact Asset Matching
16	Swap Rates
17	Interest Rate Sensitivity **Homework 2**
18	Duration of a Portfolio
19	Convexity and Immunization
20	Determinants of Interest Rates **Quiz 2**
21	Effective and Continously Compounded Rates
22	Inflation
23	Inflation (Cont.)
24	Final Exam Reviews **Term Paper**
25	**Final Exam**