



Mat 371 – Financial Mathematics

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| <i>Instructor</i> | <i>Dr. Mohammed Aba Oud</i> |
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| <i>Office</i> | <i>1-026</i> |
| <i>Office Hours</i> | <i><u>Sundays</u>: 12:30 to 14:30 and <u>Wednesdays</u>: 12:30 to 14:30</i> |

Textbook:

*Theory of Interest (Third Edition 2008) by Kellison, S., 1991, Irwin/McGraw-Hill, 660 pages
ISBN-10: 0073382442, ISBN-13: 978-0073382449*

Exams

- *Midterm1: around week 6*
- *Midterm2: around week 10*
- *Final: week 16*

Grading:

- *Midterm1: 20 - Midterm2: 20*
- *Attendance, participation, home works & quizzes: 20*
- *Final Exam: 40*



Course Contents

| <i>Title</i> | <i>Contents</i> | <i>week</i> | <i>Number of weeks</i> |
|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------|
| Chapter zero Review | <i>Exponents and logarithms. Progressions. Arithmetic and geometric progressions.</i> | 1 | 1 week |
| Chapter 1: Elements of the theory of interest | <i>Simple interest and simple discount. Simple interest, time between dates, equation of value, Exercises</i> | 2 | 5 weeks |
| | <i>Partial payments, simple discount. Compound interest and compound discount. Accumulated value, equivalent rate, Exercises</i> | 3 | |
| | <i>Discounted value, finding the rate, finding the time, equation of value, compound discount at a discount rate, Exercises</i> | 4 | |
| | <i>Continuous interest rate, force of interest. Random interest rate.</i> | 5 | |
| | <i>Cash flow diagram, equation of value, method of equated times, Midterm1.</i> | 6 | |
| Chapter 2: Annuities, Amortization, and Sinking Funds | <i>Simple annuities. Definition, accumulated value of a simple annuity, discounted value of a simple annuity, Exercises</i> | 7 | 4 weeks |
| | <i>Other simple annuities, finding the term of an annuity, finding the interest rate, Exercises</i> | 8 | |
| | <i>General and other annuities. General annuities, perpetuity, annuities with different payments, Exercises</i> | 9 | |
| | <i>Amortization and sinking fund. Amortization of a debt, outstanding principal, mortgage, refinancing a loan, sinking fund, Midterm2</i> | 10 | |
| Chapter 3: Rates of return | <i>Internal rate of return (yield rate), One-period rate of return of a fund, Rate of return over longer periods Exercises</i> | 11 | 2 weeks |



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| | <i>Portfolio return and return of a short-selling strategy, Minimizing volatility, Exercises</i> | <i>12</i> | |
| <i>Chapter 4: Bonds and Yield Rates</i> | <i>Bond. Definition, purchase price to yield an investment rate, Exercises</i> | <i>13</i> | <i>2 weeks</i> |
| | <i>Callable bonds, premium and discount, finding the yield rate, Exercises</i> | <i>14</i> | |
| | <i>Review</i> | <i>15</i> | <i>1 week</i> |