

University of Illinois -Urbana Champaign

ASRM 210: Theory of Interest

Fall 2020 Course Outline

Instructor: Paa Kow Cole

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Mode of Instruction

The course will be administered via compass and zoom. I will provide two sections every week to further explain concepts and answer your questions. The two sections will be held on Mondays and Wednesdays from 8:30 am to 9:20 am. I implore you all to attend the zoom sections.

Objectives

The goal of this course is to provide an understanding of the fundamental concepts in Financial mathematics, and how those concepts are applied in calculating present values and accumulation values for various streams of cash flows as a basis for future use in reserving, valuation, pricing, asset/liability management, investment income, capital budgeting, and valuating contingent cash flows.

This course prepares students for the FM (Financial Mathematics) professional exams.

Books

Brovaman, S.A., Mathematics of Investment and Credit (Seventh Edition), 2017, ACTEX Publications, ISBN: 978-1-63588-221-6

Daniel, J.W., and Vaaler, L.J.F., Mathematical Interest Theory (Second Edition), 2009, The Mathematical Association of America, ISBN: 978-0883857540

Kellison, S.G., The Theory of Interest (Third Edition), 2009, Irwin/McGraw-Hill, ISBN: 125921544X or 978-1259215445

Francis, J., and Ruckman, C., Interest Theory-Financial Mathematics and Deterministic Valuation (Second Edition), 2018, ActuarialBrew, ISBN: 978-0998160405

Chan, Wai-Sum, and Tse, Yiu-kuen, Financial Mathematics for Actuaries, Second Edition, 2018, World Scientific Publishing Company, ISBN: 978-9813224667 (hard Cover) or 978-9813224674

Recommended Calculators

Texas Instrument BA-35

Texas Instrument BA II Plus

Required Background

MATHS 231 or Equivalent

Topics

Weeks	Dates	Module	Topics
1-3	8/24-9/5	Module 1	Interest Rates -Simple Interest, Compound Interest, Effective rate of Interest, Effective Rate of Discount, Nominal Rates and Force of Interest Present Values and Accumulated Values
4-5	9/6-9/19	Module 2	Annuities -Annuity Immediate, Annuity-due, Deferred Annuities, Perpetuities, annuities payable p-thly, annuities payable continuously
6-7	9/20-10/3	Module 3	Loans -Principal, Interest, term of Loan, outstanding loan balance, final payment, amortization.
8	10/4-10/10	Module 4	Comparing Investments -Net Present Value, Internal Rate of Return, Money weighted Rate of Return and time-weighted Rate of Return.
9-10	10/11-10/24	Module 5	Cash flow matching -duration, convexity and Immunization

11-12	10/25-11/7	Module 6	Bonds - Yield rates, coupons, term of a bond, callable bond/non-callable bonds.
13	11/8-11/14	Module 7	Spot Rate, Forward Rate, Yield Curve stock Price and Stock dividend. Federal Reserve Bank
14-15	11/15-12/5	Module 8	Swaps -Swap term, notional amount, settlement dates, settlement period, counterparties.
16	12/6-12/9		Revision

Assessment

Assignments -70%

7 assignments at 10% each.

Midterm -10%

1 midterm at the end of module 4.

Finals – 20%

Grading Scale (%)

A+	97-100
A	93-96
A-	90-92
B+	87-89
B	83-86
B-	76-82
C+	70-75
C	65-69
C-	60-64
D+	55-59
D	50-54
F	<50

Academic Integrity Statement

The University has the responsibility for maintaining academic integrity so as to protect the quality of education and research on our campus and to protect those who depend upon our integrity.

Expectations for each student

It is the responsibility of each student to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and conduct that aids others in such infractions. Students have been given notice of this part by virtue of its publication. Regardless of whether a student has actually read this part, a student is charged with knowledge of it. Ignorance is not a defense.

Further details: <https://studentcode.illinois.edu/article1/part4/1-401/>

Accommodation Statement

To obtain disability-related academic adjustments and /or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible.

DRES Email: disability@illinois.edu

For more details visit DRES' website: <https://www.disability.illinois.edu/>