



STA 4183 (17170)

Fall 2022

Theory of Interest

MWF: 10:40-11:30 in MCCB G086

Instructor: Demetris Athienitis

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Teaching Assistant: TBA

Office: See office in e-Learning under “Pages”

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Course Website: [e-Learning](#)

Lectures: In-person.

Course Material: Material/Slides will be provided in course website.

Course Communication:

- Discussion forum (Microsoft Teams).
- Office hours (posted under “Pages” in e-Learning).
- E-mail for questions regarding course policies. (Ensure that **STA 4183** is in the subject line. Failure to do so may result in a non-response.)

Required Text(s): None

Optional Text(s):

1. **Interest Theory (2e), by Francis and Ruckman**
2. Mathematical Interest Theory (2e), by Vaaler and Daniel
3. The Theory of Interest (3e), by Stephen G. Kellison
4. [A Basic Course in the Theory of Interest and Derivatives Markets: A Preparation for Exam FM/2](#), by Marcel B. Finan

Course Description: A study of basic interest concepts with applications. Topics include simple and compound interest, equations of value, annuities-certain, loan amortization, bond valuation, calculation of yield rates, interest rate sensitivity, the term structure of interest rates, and interest rate markets.

Prerequisite(s): MAC 2312

Credit Hours: 3

Purpose of Course: The course is designed is designed to align closely with the [syllabus for the Society of Actuaries Financial Mathematics Exam](#) to prepare students for a career as an actuary.

Course Goals and Objectives: This course aims to develops the candidate's understanding of the fundamental concepts of financial mathematics, and how those concepts are applied in calculating present and accumulated 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 valuing contingent cash flows.

Course Policies

The instructor reserves the right to update any parts of this syllabus as necessary.
Students will promptly be notified of any changes.

Demeanor

All members of the class are expected to follow rules of common courtesy in all classroom discussions, email messages, threaded discussion and chats. Please refer to [expected class netiquette](#) online and during class.

Electronic devices

During class time, only laptops and tablets are allowed. Cell phones, smartphones, and phablets are not permissible unless otherwise specified by the instructor. A student found using said device or permissible device used for non-classroom related activities during class time will be asked to leave the classroom which may result in missing any remaining assignments administered during class time.

Assignments

- All **deadlines (excluding exams) are at 23:59** of the due/end date as posted on e-Learning. These are **hard deadlines** meaning that any open or ongoing assignments will automatically be submitted at the deadline. No late assignments will be accepted under any circumstances.
- Students are expected to work independently, unless otherwise specified in writing. **Offering and accepting** solutions - even from textbook - is an act of **plagiarism**, which is a serious offense and **all involved parties will be penalized according to the UF Student Honor and Conduct Code**. Discussion amongst students is encouraged, but when in doubt, direct your questions to the instructor.
- Students are expected to **show and explain their work**.
- All electronically **submitted work must be as one merged file**. In Canvas, all uploaded files automatically get a grade of 0, until the teaching assistant grades them.
- Assignments are automatically submitted at deadline even if in progress.
- Feedback will provided within two business days from the assignment deadline.

Homework/Quizzes

Eleven homework assignments will be posted on e-Learning, including deadlines. Homework is assigned to help reinforce the material learned in class—not just to get the right answer and improve your course grade! Homework solutions must show all formulas and steps used and be the sole work of each individual student.

Exams

Three (3) in class exams will be administered. The exams will each consist of multiple-choice and free-response questions. The multiple-choice questions are intended to be similar to questions on the Society of Actuaries Exam FM. Also in accordance with SOA exams, **no formulas or formula sheets** will be allowed for the exams, and **only calculators from the TI-30 series (TI-30Xa, TI-30X II, or TI-30XS) or TI-BA series (BA-35, BA II Plus, or BA II Plus Professional) may be used**. A review session will be held during the class period prior to each exam. Although many concepts learned early in the course continue to be used later in the course, the exams are not designed to be cumulative.

Important dates:

Exam #1	September 23, at 10:40
Exam #2	October 30, at 10:40
Exam #3	December 14, at 15:00

Grading

Grade distribution:

Exams 1, 2 and 3	75% (20% lowest, 25% second best, 30% best)
Homework	25% (lowest 1 dropped)
Orientation Quiz	1%
Extra Credit	extra 0-1% (discussion forum and class participation)

$$\begin{aligned} \text{Final} &= 0.20(\text{worst exam}) + 0.25(\text{second best exam}) + 0.30(\text{best exam}) \\ &+ 0.25 \left(\sum \text{HW} - \text{lowest} \right) \\ &+ 0.01 (\text{Orientation Quiz}) \\ &+ \text{Extra} \end{aligned}$$

Letter grade assignment:

There will be *no rounding up* of scores.

B+	84 to < 88	A	91 to 100	A-	88 to < 91
C+	74 to < 77	B	80 to < 84	B-	77 to < 80
D+	64 to < 67	C	70 to < 74	C-	67 to < 70
E	< 55	D	60 to < 64	D-	55 to < 60

To view the result of the letter grades to your GPA please visit the [UF Grade and Grading Policies](#). **Final grades shown on Canvas are not accurate because they do not account for the conditional weighing of exams and quizzes.**

COVID-19 (and other infectious diseases)

In response to COVID-19, the following recommendations are in place to maintain your learning environment, to enhance the safety of our in-classroom interactions, and to further the health and safety of ourselves, our neighbors, and our loved ones.

- If you are not vaccinated, get vaccinated. Vaccines are readily available and have been demonstrated to be safe and effective against the COVID-19 virus. Visit [one.uf](#) for screening/testing and vaccination opportunities.
- If you are sick, stay home. Please call your primary care provider if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 to be evaluated.
- Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work.

Make-up

Requirements for class attendance and make-up exams, assignments, and other work in this course as well as policies regarding absences, religious holidays, illness and student athletes are consistent with [UF Attendance Policies](#).

Additional make-up policy requirements

- Every effort should be made to complete the assignment/exam during the open period. Only extreme situations will warrant a makeup. Contact the instructor prior to the exam - as soon as you realize you will be unable to take the assignment/exam at the scheduled time. Each case will be reviewed individually. Valid and detailed documentation is a prerequisite for scheduling a makeup under such extenuating circumstances.
- If you have an emergency on the day of the assignment/exam, the instructor must be contacted by midnight of the day of the assignment/exam.
- Make-ups need to be scheduled within a week from the assignment deadline. Student is responsible for scheduling.
- Additional Note: Being on vacation or booking a trip prior to the completion of the semester is not a valid reason to request a makeup. Please reference the most recent [Academic Calendar](#).

Addressing Issues

Technical difficulties

Please contact the UF Help desk via e-Learning “Help” tab. Any requests for make-ups due to technical issues must be accompanied with appropriate documentation/proof including screenshots and communication with the help desk. You **MUST** contact your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

Grievances/Commendations

Should you have any grievances or commendations with your experience in this course you can always address them to the instructor (anonymously) or to the Department of Statistics. For issues that are not satisfactorily resolved at the department level or which seem to be broader than one department, students are referred to the Office of the Ombuds.

UF and CLAS Policies

Dropping, Withdrawing and Incomplete

Dropping and Withdraw

For late course drops and course withdrawals check the [catalog](#).

Incomplete

An incomplete grade may be assigned at the discretion of the instructor as an interim grade for a course in which the student has completed a major portion of the course with a passing grade, been unable to complete course requirements before the end of the term because of extenuating circumstances, and obtained agreement from the instructor and arranged for resolution of the incomplete grade in the next term. Instructors are not required to assign incomplete grades. For complete details please visit [CLAS incomplete grade policy and contract](#).

Accommodating Students with Disabilities

Students requesting accommodation for disabilities must first register with the [Disability Resource Center \(DRC\)](#). The DRC will provide documentation to the students who must then provide this documentation to the instructor when requesting information. You must submit this documentation prior to submitting any assignments for which you are requesting accommodation.

U Matter, We Care

[U Matter, We Care](#), through the Dean of Student’s Office, offers care related resources and programs focused on health, safety, and holistic well-being.

Academic Misconduct

Students are held accountable to the [UF Student Honor and Conduct Code](#).

Evaluations

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

Tentative Course Outline

Week	Section	Lesson	HW
1	5.5a 2.1-2.2	A1 = Accumulation Functions A2 = Simple Interest and Discount	
2	2.3-2.4 3.1-3.3 3.4, 3.8	A3 = Simple Equivalence and Valuation A4 = Compound Interest and Discount A5 = Compound Equivalence and Valuation	Intro
3	3.5-3.6, 3.9 3.7, 3.8b 4.1, 4.3	A6 = Nominal Interest and Discount A7 = Nominal Equivalence and Valuation A8 = Force of Interest and Discount	A
4	4.2 5.1-5.2 5.3-5.4, 5.5b	A9 = Continuous Equivalence and Valuation A10 = Discretely Varying Rates A11 = Continuously Varying Rates	AA
5	Exam 1		
6	6.1-6.3 6.4 7.0	B1 = Annuities Immediate and Due B2 = Deferred Annuities B3 = Annuities Payable Less Frequently	B
7	7.1-7.2 10.1-10.2	B4 = Annuities Payable More Frequently B5 = Geometric Annuities	BB
8	8.2 8.1, 8.4	C1 = Arithmetic Annuities C2 = Increasing and Decreasing Annuities	C
9	8.3 7.3 9.1-9.2	C3 = Arithmetic Perpetuities C4 = Continuous Annuities C5 = Continuous Varying Annuities	CC
10	Exam 2		
11	11.1 11.2 11.3	D1 = Loan Payments D2 = Loan Amortization D3 = Balloon and Drop Payments	D
12	13.1 13.2 13.3	E1 = Bond Pricing E2 = Bond Amortization E3 = Callable Bonds	E
13	14.1-14.2 14.3 14.5, FM 24-17	F1 = Duration F2 = Convexity F3 = Approximations of Value	F
14	15.1-15.2 15.3-15.4 16.1-16.4	G1 = Cash Flow Matching G2 = Immunization G3 = Spot and Forward Rates	G
Exam 3			