



STA 4930 – Actuarial Mathematics & Statistics (24248)

Spring 2025

Period 6: Monday, Wednesday, Friday 12:50 pm – 1:40 pm

Room: Turlington Hall 2305 (TUR 2305)

Instructor:

David Lindberg

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Phone: (352) 273-1897

Office: Griffin-Floyd 115B

Office Hours:

Tuesday, Thursday 1:30 pm – 3:30 pm

Teaching Assistant:

Yiqiao Zhang

Email: yiqiaozhang@ufl.edu

Zoom Office Hours (link on Canvas)

Thursday 10:00 am – 12:00 pm

eLearning Course Webpage on Canvas:

<http://elearning.ufl.edu/>

Course Description

This course covers the mathematical and probabilistic structure of life-contingent financial instruments. It provides an introduction to survival models, covers life tables and their applications, the benefits and pricing of life insurance, lifetime annuities, and the mathematics of pensions. The course is designed to align closely with the syllabus for the [Society of Actuaries \(SOA\) Fundamentals of Actuarial Mathematics \(FAM\) Exam](#) to prepare students for a career as an actuary.

Prerequisite(s)

MAC 2313 and at least two additional Statistics or Mathematics courses at the 4000 level or higher. It is recommended that STA 4321 be taken prior or concurrently.

Credit Hours

This is a 3 credit-hour class

Required Text(s)

None

Optional Text(s)

1. *Actuarial Mathematics for Life Contingent Risks* by D. Dickson, M. Hardy, and H. Waters, 3rd Edition
2. *Loss Models: From Data to Decisions* by S. Klugman, H. Panjer, and G. Willmot, 5th Edition.

Calculator(s)

In accordance with the SOA exams, the following models of Texas Instruments financial calculators are recommended for this course:

- BA-35
- BA II Plus
- BA II Plus Professional
- TI-30Xa
- TI-30X II (IIS solar or IIB battery)
- TI-30XS MultiView (or XB battery)

Any other scientific or graphing calculator may be used for homework and exams, however, it's encouraged to use one of the three financial calculators listed above for this course. Internet-enabled electronic devices, such as cell phones or tablets, cannot be used as calculators during exams.

Tentative Schedule of Course Topics

AM = Actuarial Mathematics textbook, LM = Loss Models textbook

| Week(s) | Chapters from Notes | Description |
|---------------|---------------------|--|
| 1 | AM1 | Review Material, Life Contingent Financial Instruments |
| 2-3 | AM2 | Survival Models |
| 3-5 | AM3 | Life Tables |
| Exam 1 | | |
| 6 | AM4 | Insurance Benefits |
| 7-8 | AM5 | Annuities |
| 8-9 | AM6 | Premium Calculations |
| 10 | AM7 | Policy Values |
| Exam 2 | | |
| 11 | LM3 | Basic Distributional Quantities |
| 12 | LM4 | Characteristics of Actuarial Models |
| 13 | LM5 | Continuous Models |
| 14 | LM6 | Discrete Distributions |
| Exam 3 | | |

Course Assignments

The course assignments will be three (3) exams, eight (8) homework assignments, and eleven (11) quizzes.

(A) Exams

Three (3) exams will be held in class will be administered tentatively scheduled as follows:

- Exam 1: Friday, February 14
- Exam 2: Monday, March 31
- Exam 3: Wednesday, April 23

Exam 1 will cover Chapters 1-3 from the Actuarial Mathematics textbook, Exam 2 will cover Chapters 4-7 from the Actuarial Mathematics textbook, and Exam 3 will cover Chapters 3-6 from the Loss Models textbook. Each exam has a maximum score of 200 points.

To the exam, you may bring a calculator, writing utensil, and one double-sided handwritten formula sheet dimensions $8\frac{1}{2}'' \times 11''$. No printed or photocopied formula sheets are allowed. Formula sheets will be collected at each exam.

(B) Quizzes

Eleven (11) quizzes are assigned. All quizzes are given in the eLearning environment. The quizzes will have five questions covering the previous week's material. You will have 60 minutes to complete the quiz. You should have a reliable internet connection when you start the quiz. Computers and study rooms are available at the UF Libraries.

All quizzes are available at 12:00 am on the release date and will be due at 11:59 pm on the due date. The release dates and due dates are shown in the table below. Each question on the quiz is worth 4 points, which means that the highest score on one quiz is 20 points.

Each quiz will have a maximum of two attempts and the best grade out of two will be the grade for each quiz. The highest ten quiz scores will be used to calculate the total quiz score. A maximum of 200 points can be earned for the total of the ten best quiz scores.

| Quiz | Date Released | Date Due |
|------|------------------------|---------------------|
| 1 | Wednesday, January 22 | Friday, January 24 |
| 2 | Wednesday, January 29 | Friday, January 31 |
| 3 | Wednesday, February 5 | Friday, February 7 |
| 4 | Wednesday, February 19 | Friday, February 21 |
| 5 | Wednesday, February 26 | Friday, February 28 |
| 6 | Wednesday, March 5 | Friday, March 7 |
| 7 | Wednesday, March 12 | Friday, March 14 |
| 8 | Wednesday, March 26 | Friday, March 28 |
| 9 | Friday, April 4 | Monday, April 7 |
| 10 | Friday, April 11 | Monday, April 14 |
| 11 | Friday, April 18 | Monday, April 21 |

(C) Homework

A total of 8 homework assignments will be given throughout the semester, each worth 25 points. Homework assignments will be posted on the e-Learning course page. The homework due dates are below. The homework is to be turned in to the eLearning system on the due date. Any homework assignment received after 11:59 pm on the due date is subject to a 5-point penalty out of 25 points for each day after the due date (for example the maximum score for homework turned in one day late would be 20 points).

If you choose to type up your homework in LaTeX you will receive an additional 1 point added to each homework assignment grade (out of 25). A LaTeX template is provided on the course webpage.

Homework is assigned to help reinforce the material learned in class—not just to get the right answer and improve your course grade. Although all the homework questions are multiple choice, homework solutions must show all formulas and steps used to arrive at the answer and be the sole work of each individual student.

| Homework | Date Assigned | Date Due |
|----------|------------------------|------------------------|
| 1 | Friday, January 17 | Monday, January 27 |
| 2 | Monday, January 27 | Wednesday, February 5 |
| 3 | Wednesday, February 5 | Wednesday, February 12 |
| 4 | Monday, February 17 | Wednesday, February 26 |
| 5 | Wednesday, February 26 | Friday, March 7 |
| 6 | Friday, March 7 | Wednesday, March 26 |
| 7 | Wednesday, April 2 | Friday, April 11 |
| 8 | Friday, April 11 | Monday, April 21 |

Total Course Points and Grades

Grades will be posted on the e-Learning course page at <http://elearning.ufl.edu/>. The current UF grading policies for assigning grade points is available at <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>.

| Assignment | Points |
|------------------------|--------|
| Exam 1 | 200 |
| Exam 2 | 200 |
| Exam 3 | 200 |
| Highest 10 Quiz Scores | 200 |
| Homework Assignments | 200 |
| Total | 1000 |

Letter Grade Distribution:

| Letter | Points |
|--------|---------------|
| A | 920 to 1000 |
| A- | 890 to 919 |
| B+ | 860 to 889 |
| B | 820 to 859 |
| B- | 790 to 819 |
| C+ | 760 to 789 |
| C | 690 to 759 |
| C- | 660 to 689 |
| D | 620 to 659 |
| E | 619 and below |

Actuarial Science Minor and FASS

For more information on the actuarial science minor at the University of Florida and the Florida Actuarial Student Society (FASS) see

<https://stat.ufl.edu/academics/undergraduate/minor-in-actuarial-science/>.

Dr. David Lindberg is the academic advisor for actuarial science minors. For more information on advising, see <https://stat.ufl.edu/academics/undergraduate/>

School Closures

If classes at the University of Florida are canceled, the course will be suspended until the university re-opens. The University will announce this closure on the University of Florida homepage. Any announcements about the course will be posted at the course e-Learning webpage.

Course Policies

The instructor reserves the right to update parts of this syllabus in the event of extenuating circumstances (such as changing the due dates for homework and quizzes or exam dates, eliminating or modifying course material, etc.). Students will promptly be notified of any changes.

Privacy Policies

Student records are confidential. Only information designated “UF directory information” may be released without your written consent. UF views each student as the primary contact for all communication. If your parents contact me about your grade, attendance or other information that is not “UF directory information”, they will be directed to contact you. More information can be found at <https://catalog.ufl.edu/UGRD/academic-regulations/ferpa-confidentiality-student-records/>

E-mail

E-mail relating to information about the class should be sent to the instructor at dlinberg@ufl.edu or through the course management system. Your message will be answered within one working day, in most cases. However, we ask that you refer to this syllabus and the course website to try to find

the answers yourself. Questions regarding the material covered should be asked before, during, or after class, at the instructor's office hours, or at the teaching assistant's office hours. It is often difficult to answer questions regarding material through e-mail. Questions about quizzes should be sent to the instructor and it should include the quiz number and question number.

Make-up Policy

The requirements of this course for class attendance, exams, assignments, and other work are consistent with university policies. See UF Academic Regulations and Policies for more information on university attendance policies.

Instructor's Honor Code

We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity by abiding by the Student Honor Code. On all work submitted for credit by Students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

Academic Honesty

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: 'On my honor, I have neither given nor received unauthorized aid in doing this assignment.'" The Honor Code (<https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor.

Students with Disabilities

Students who require special accommodations in class or during exams should first register with the Disability Resource Center at 352-392-8565, <https://disability.ufl.edu/> by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation for an exam or quiz. The instructor must be emailed the form at least 7 days before an exam or quiz for accommodations to be arranged.

Grading

Grades will be changed only when an error has been made; negotiation is not appropriate.

Incomplete

Incomplete grades are only assigned when extraordinary circumstances (such as an accident, or extended hospitalization), arising after the date for dropping the course, prevent the student from completing the course requirements. Having a failing grade in the course is not a valid reason for requesting an Incomplete.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://gatorevals.aa.ufl.edu/>. Evaluations are typically open during the few weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://gatorevals.aa.ufl.edu/instructors/instructor-reports/>.