The University of Iowa
College of Liberal Arts and Sciences
Department of Statistics and Actuarial Science
ACTS:4180 Life Contingencies I   Spring Semester 2024
11:30 AM - 12:20 PM   MWF   74 SH

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Student drop-in hours: 2:30–3:30 p.m. Tuesday, 1:30–2:30 p.m. Wednesday, and 2–3 p.m. Friday, or by appointment
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Prerequisites: C+ or better in each of ACTS:3080, ACTS:4130, and STAT:4100 (or STAT:5100). Calculus (including differential equations) and probability are used extensively in this course.
CLAS is the home of this course, and CLAS governs the add and drop deadlines, the "second-grade only" option (SGO), academic misconduct policies, and other undergraduate policies and procedures.
This course is based on the syllabi for the two Society of Actuaries (SOA) examinations on Long-Term Actuarial Mathematics: FAM-L and ALTAM. To write Exam FAM in the first week of March, you need to register by January 30.
Topics to be covered are: Net premium reserve, gross premium reserve, modified net premium reserve, Thiele's reserve differential equation, reserve recursion formulas, universal life insurance, multi-life functions, multiple decrement models, fundamental theorem of asset pricing, and Esscher transform.
Two textbooks will be used. Solutions manuals are available for both books.
AM: *Actuarial Mathematics*, 2nd edition, by N. L. Bowers, Jr., H. U. Gerber, J. C. Hickman (U Iowa MS 1952, PhD 1961), D. A. Jones (U Iowa MS 1956, PhD 1959), and C. J. Nesbitt, published by SOA in 1997, and reprinted with corrections in 2000.
AMLCR3: *Actuarial Mathematics for Life Contingent Risks*, 3rd edition, by D.C.M. Dickson, M.R. Hardy, and H.R. Waters, published by Cambridge University Press in 2020.
Below are some useful references.
- *Life Contingencies*, 2nd edition, by C. W. Jordan, Jr., Society of Actuaries 1967.
- *Life Insurance Mathematics*, 3rd edition, by H. U. Gerber (published by Springer for the Swiss Association of Actuaries). http://link.springer.com/book/10.1007/978-3-662-03460-6
- *Models for Quantifying Risk*, 6th edition, by S.J. Camilli, I. Duncan, and R. L. London, ACTEX Publications, and its *Solutions Manual*.
- *Fundamentals of Actuarial Mathematics*, 3rd edition, by S. D. Promislow, Wiley.
- *Stochastic Models in Life Insurance* by Michael Koller (published by Springer for the European Actuarial Academy). Using a campus connection, you can download the entire book for free http://link.springer.com/book/10.1007/978-3-642-28439-7
- *Introduction to Insurance Mathematics*: *Technical and Financial Features of Risk Transfers* by Annamaria Olivieri and Ermanno Pitacco . You can download it for free https://link.springer.com/book/10.1007/978-3-642-16029-5

There will be two Friday evening (6:30 to 8:30 p.m.) midterm examinations, February 23 and April 5.
You are to use an official SOA calculator. Tentatively, the final grade (H.W. 7%; Midterm Exams 25%, 25%; Final Exam 43%) will be assigned as follows:
Undergrads F[0, 40); D−[40, 45); D[45, 50); D+[50, 55); C−[55, 60); C[60, 65);
C+[65, 70); B−[70, 75); B[75, 80); B+[80, 85); A−[85, 90); A[90, 95); A+[95, 100]
Graduate students F[0, 46); D−[46, 50.5); D[50.5, 55); D+[55, 59.5); C−[59.5, 64); C[64, 68.5);
C+[68.5, 73); B−[73, 77.5); B[77.5, 82); B+[82, 86.5); A−[86.5, 91); A[91, 95.5); A+[95.5, 100]
Note: The pre-requisite for the next course, ACTS:4280 (for ALTAM), is C+ or better in ACTS:4180.

Academic Honesty and Misconduct
All students in CLAS courses are expected to abide by the CLAS Code of Academic Honesty. Undergraduate academic misconduct must be reported by instructors to CLAS according to these procedures. Graduate academic misconduct must be reported to the Graduate College according to Section F of the Graduate College Manual.

Student Complaints
Students with a complaint about a grade or a related matter should first discuss the situation with the instructor and/or the course supervisor (if applicable), and finally with the Director or Chair of the school, department, or program offering the course.
Undergraduate students should contact CLAS Undergraduate Programs for support when the matter is not resolved at the previous level. Graduate students should contact the CLAS Associate Dean for Graduate Education and Outreach and Engagement when additional support is needed.

Drop Deadline for this Course
You may drop an individual course before the deadline; after this deadline you will need collegiate approval. You can look up the drop deadline for this course here. When you drop a course, a "W" will appear on your transcript. The mark of "W" is a neutral mark that does not affect your GPA. Directions for adding or dropping a course and other registration changes can be found on the Registrar's website. Undergraduate students can find policies on dropping and withdrawing here. Graduate students should adhere to the academic deadlines and policies set by the Graduate College.

Date and Time of the Final Exam
The final examination date and time will be announced by the Registrar generally by the fifth week of classes and it will be announced on the course ICON site once it is known. **Do not plan your end of the semester travel plans until the final exam schedule is made public. It is your responsibility to know the date, time, and place of the final exam.** According to Registrar's final exam policy, students **have a maximum of two weeks after the announced final exam schedule** to request a change if an exam conflict exists or if a student has more than two exams in one day (see the policy here)**.**

Attendance and Absences
University regulations require that students be allowed to make up examinations that have been missed due to illness, religious holy days, military service obligations (including service-related medical appointments), or other unavoidable circumstances or University-sponsored activities. Students with UI-authorized activities must discuss their absences with the instructor as soon as possible. Religious obligations must be communicated within the first three weeks of classes.

Exam Policies

Communication: UI Email
Students are responsible for all official correspondences sent to their UI email address (uiowa.edu) and must use this address for any communication with instructors or staff in the UI community.

Mental Health Resources and Student Support
Students are encouraged to be mindful of their mental health and seek help as a preventive measure or if feeling overwhelmed and/or struggling to meet course expectations. Students are encouraged to talk to their instructor for assistance with specific class-related concerns. For additional support and counseling, students are encouraged to contact University Counseling Service (UCS). Information about UCS, including resources and how to schedule an appointment, can be found at counseling.uiowa.edu. Find out more about UI mental health services at mentalhealth.uiowa.edu.

Student Care and Assistance provides assistance to University of Iowa students who are experiencing a variety of crisis and emergency situations, including but not limited to medical issues, family emergencies, unexpected challenges, and sourcing basic needs such as food and shelter. More information on the resources related to basic needs can be found at basicneeds.uiowa.edu/resources/. Students are encouraged to contact Student Care & Assistance in the Office of the Dean of Students (Room 135 IMU, dos-assistance@uiowa.edu, or 319-335-1162) for support and assistance with resources.

University Policies

Accommodations for Students with Disabilities
The University is committed to providing an educational experience that is accessible to all. If a student has a diagnosed disability or other disabling condition that may impact the student's ability to complete the course requirements as stated in the syllabus, the student may seek accommodations through Student Disability Services (SDS). SDS is responsible for making Letters of Accommodation (LOA) available. **The student must provide an LOA to the instructor as early in the semester as possible, but requests not made at least two weeks prior to the scheduled activity for which an accommodation is sought may not be accommodated.** The LOA will specify what reasonable course accommodations the student is eligible for and those the instructor should provide. Additional information can be found on the SDS website.

Free Speech and Expression
Absences for Religious Holy Days
Classroom Expectations
Non-discrimination
Sexual Harassment/Misconduct and Supportive Measures
Sharing of Class Recordings