

The University of Iowa
College of Liberal Arts and Sciences
Department of Statistics and Actuarial Science
ACTS:4180 Life Contingencies I Spring Semester 2022
11:30 AM - 12:20 PM MWF 3 SH

Instructor: Dr. E.S.W. Shiu Office: 362 SH Phone: 319 335 2580 E-mail: elias-shiu@uiowa.edu

Office Hours: 1:45–3:15 PM Tuesday and Thursday, or by appointment

Department: Statistics & Actuarial Science, 241 SH Phone: 335 2082

D.E.O.: Dr. Kung-Sik Chan Phone: 335 0712 E-mail: kung-sik-chan@uiowa.edu

Prerequisites: C+ or better in each of ACTS:3080, ACTS:4130, and STAT:4100 (or STAT:5100). Calculus and probability are used extensively in this course.

This course is based on the syllabi for the two Society of Actuaries (SOA) examinations on Long-Term Actuarial Mathematics: FAM-L and ALTAM. It is expected that students will attempt Exam FAM in October 2022 and ALTAM in Spring 2023.

Key topics to be covered are: Net and gross premium reserves, modified reserve systems, Thiele's reserve differential equation, reserve recursion formulas, multi-life functions, multiple decrement models, Markov chains, and multi-state models.

Two books will be used in this course. 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*.
- *Fundamental 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 three evening (6:30 to 8:30 pm) midterm exams, on January 31 (Monday), March 3 (Thursday) and April 12 (Tuesday). **You are to use an official SOA calculator.** Tentatively, the final grade (H.W. 7%; Midterm Exams 10%, 25%, 25%; Final Exam 33%) 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, is C+ or better in ACTS:4180.

COLLEGE OF LIBERAL ARTS AND SCIENCES
Information for CLAS Undergraduates
Spring 2022

ATTENDANCE AND CLASSROOM EXPECTATIONS

Students are responsible for attending class and for knowing an instructor's attendance policies, which vary by course and content area. All students are expected to attend class and to contribute to its learning environment in part by complying with University policies and directives regarding appropriate classroom behavior or other matters.

ABSENCES

Students are responsible for communicating with instructors as soon they know that an absence might occur or as soon as possible in the case of an illness or an unavoidable circumstance. Students can use the CLAS absence form to help communicate with instructors who will decide if the absence is excused or unexcused; the form is located on ICON within the top banner under "Student Tools." Delays by students in communication with an instructor could result in a forfeit of what otherwise might be an excused absence (<https://clas.uiowa.edu/students/handbook/attendance-absences>).

ABSENCES: ILLNESS, UNAVOIDABLE CIRCUMSTANCES, AND UNIVERSITY SPONSORED ACTIVITIES

Students who are ill, in an unavoidable circumstance affecting academic work, or who miss class because of a University sponsored activity are allowed by UI policy to make up a missed exam. Documentation is required by the instructor except in the case of a brief illness. Students are responsible for communicating with instructors as soon as the absence is known (<https://opsmanual.uiowa.edu/students/absences-class#8.1>).

ABSENCES: HOLY DAYS

The University is prepared to make reasonable accommodations for students whose religious holy days coincide with their classroom assignments, test schedules, and classroom attendance expectations. Students must notify their instructors in writing of any such Religious Holy Day conflicts or absences within the first few days of the semester or session, and no later than the third week of the semester. If the conflict or absence will occur within the first three weeks of the semester, the student should notify the instructor as soon as possible. See [Operations Manual 8.2 Absences for Religious Holy Days](#) for additional information.

ABSENCES: MILITARY SERVICE OBLIGATIONS

Students absent from class due to U.S. veteran or U.S. military service obligations (including military service-related medical appointments, military orders, and National Guard Service obligations) must be excused without penalty. Instructors must make reasonable accommodations to allow students to make-up exams or other work. Students must communicate with their instructors about the expected possibility of missing class as soon as possible. (For more information, see <https://opsmanual.uiowa.edu/iv-8-absences-class%C2%A0-0>).

ACADEMIC MISCONDUCT

All undergraduates enrolled in courses offered by CLAS have in essence agreed to the College's Code of Academic Honesty. Academic misconduct affects a student's grade and is reported to the College which applies an additional sanction, such as suspension. Outcomes about misconduct are communicated through UI email (<https://clas.uiowa.edu/students/handbook/academic-fraud-honor-code>).

ACADEMIC ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

The University is committed to providing an educational experience that is accessible to all students. 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 to the student. The student must provide a 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. Note that accommodations are not granted retroactively but from the time of the student's request to the instructor onward. Additional information can be found on the [SDS website](#).

CLASS RECORDINGS: PRIVACY AND SHARING

Course lectures and discussions are sometimes recorded or live-streamed. These are only available to students registered for the course and are the intellectual property of the faculty member. These materials may not be shared or reproduced without the explicit written consent of the instructors. Students may not share these recordings with those who are not enrolled in the course; likewise, students may not upload recordings to any other online environment. Doing so is a breach of the Code of Student Conduct and could be a violation of the Federal Education Rights and Privacy Act (FERPA); also see <https://dos.uiowa.edu/policies/code-of-student-life/>.

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 ([Operations Manual, III.15.2](#)). Emails should be respectful and brief, with complex matters addressed during the instructor's drop-in hours, for example. Faculty are not expected to answer email after business hours or during the weekends.

COMPLAINTS ABOUT ACADEMIC MATTERS

Students with a complaint about a grade or a related academic issue should first visit with the instructor and then with the course supervisor (if one is assigned), and next with the Chair of the department or program offering the course. If not resolved, students may bring their concerns to the College of Liberal Arts and Sciences: <https://clas.uiowa.edu/students/handbook/student-rights-responsibilities>.

FINAL EXAMINATION POLICIES

The final exam schedule is published during the fifth week of the fall and spring semesters or on the first day of summer classes; *students are responsible for knowing the date, time, and place of their final exams*. Students should not make travel plans until knowing this information. A student with exams scheduled on the same day and time or who have more than two final exams on the same day should visit this page for how to resolve these problems by the given deadline:

<https://registrar.uiowa.edu/makeup-final-examination-policies>. No exams may be scheduled the week before finals; some exception, however, have been made for labs, language courses, and off-cycle courses (<https://registrar.uiowa.edu/final-examination-scheduling-policies>).

FREE SPEECH AND EXPRESSION

The University of Iowa supports and upholds the First Amendment protection of freedom of speech and the principles of academic and artistic freedom. We are committed to open inquiry, vigorous debate, and creative expression inside and outside of the classroom. Visit Free Speech at Iowa for more information on the University's policies on free speech and academic freedom (<https://freespeech.uiowa.edu/>).

HOME OF THE COURSE

The College of Liberal Arts and Sciences (CLAS) is the home of this course, and CLAS governs the course's add and drop deadlines, the "second-grade only" option (SG0), and other undergraduate policies and procedures. Different UI colleges may have other policies or deadlines. See <https://clas.uiowa.edu/students/handbook>. Questions? Contact CLAS at clasps@uiowa.edu or 319-335-2633.

MENTAL HEALTH

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 Health can also address related concerns (<https://studenthealth.uiowa.edu/>). These visits are free to students. After hours, students are encouraged to call the Johnson County Community Crisis Line at (319) 351-0140 or dial 911 in an emergency.

NON-DISCRIMINATION STATEMENT

The University of Iowa prohibits discrimination in employment, educational programs, and activities on the basis of race, creed, color, religion, national origin, age, sex, pregnancy, disability, genetic information, status as a U.S. veteran, service in the U.S. military, sexual orientation, gender identity, associational preferences, or any other classification that deprives the person of consideration as an individual. The university also affirms its commitment to providing equal opportunities and equal access to university facilities. For additional information on nondiscrimination policies, contact the Director, [Office of Institutional Equity](#), the University of Iowa, 202 Jessup Hall, Iowa City, IA 52242-1316, 319-335-0705, oi-e-ui@uiowa.edu. Students may share their pronouns and chosen/preferred names in [MyUI](#), which is accessible to instructors and advisors.

SEXUAL HARASSMENT

The University of Iowa prohibits all forms of sexual harassment, sexual misconduct, and related retaliation. The [Policy on Sexual Harassment and Sexual Misconduct](#) governs actions by students, faculty, staff and visitors. Incidents of sexual harassment or sexual misconduct can be reported to the [Title IX and Gender Equity Office](#) or to the [Department of Public Safety](#). Students impacted by sexual harassment or sexual misconduct may be eligible for academic supportive measures and can learn more by [contacting the Title IX and Gender Equity Office](#). Information about confidential resources can be found [here](#). Watch the [video](#) for an explanation of these resources.