

The University of Iowa
College of Liberal Arts and Sciences
Department of Statistics and Actuarial Science
Course Outline for ACTS:4130 Quantitative Methods for Actuaries Fall Semester 2024
MWF 1:30 to 2:20 pm 15 SH

Instructor: Dr. E.S.W. Shiu Office: 362 SH Phone: 319 335 2580 E-mail: elias-shiu@uiowa.edu
Office Hours: 2:30 to 3:30 pm TWF; or by appointment.

Department: Statistics & Actuarial Science, 241 SH Phone: 319 335 2082

D.E.O.: Dr. Kung-Sik Chan Phone: 319 335 0712 E-mail: kung-sik-chan@uiowa.edu

Co-requisites: ACTS:3080 and STAT:4100 or 5100. Calculus (including first-order ordinary differential equations) and probability theory are used extensively in this course.

The College of Liberal Arts and Sciences (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. Other UI colleges may have different policies.

The required textbook is *Actuarial Mathematics for Life Contingent Risks*, 3rd ed (2020), by D.C.M. Dickson, M.R. Hardy, and H.R. Waters, Cambridge University Press. The goal of the course is to cover its Chapters 1 to 6; if possible, also portions of Chapter 7. This book is also the textbook for ACTS:4180 and 4280, and for SOA Exams FAM and ALTAM. Below are some useful references.

- *Actuarial Mathematics*, 2nd edition (1997), 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, Society of Actuaries. I shall refer to this book frequently. If you want a paper copy of this book, let me know.
- *Solutions Manual for Actuarial Mathematics for Life Contingent Risks*, 3rd edition, by D. C. M. Dickson, M. R. Hardy, and H. R. Waters, Cambridge University Press.
- *Life Contingencies*, 2nd edition (1967), by C. W. Jordan, Jr., Society of Actuaries, Chicago.
- *Life Insurance Mathematics*, 3rd edition (1997), by H. U. Gerber (a book published by Springer for the Swiss Association of Actuaries). <http://link.springer.com/book/10.1007/978-3-662-03460-6>
- *The Mathematics of Life Insurance: A Practical Guide to the Application of Insurance Principles* (1965), by W. O. Menge and C. H. Fischer (U Iowa MS 1930, PhD 1932), Ulrich’s, Ann Arbor, MI.
- *Models for Quantifying Risk*, 6th edition (2014), by S. J. Camilli, I. Duncan, and R. L. London, ACTEX Publications, and its *Solutions Manual*.
- *Fundamentals of Actuarial Mathematics*, 3rd edition (2015), by S. D. Promislow, Wiley.
- *Stochastic Models in Life Insurance* (2012), by [Michael Koller](#) (a book 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>

There will be two evening (6:30 to 8:30 pm) midterm exams, held in 40 SH on October 8 (Tuesday) and November 15 (Friday). The final exam will be held in the week of December 16. All exams are closed book and closed note; no crib sheets are allowed. You are to use an SOA-approved calculator.

Tentatively, your numerical grade will be calculated by the formula,

$$\text{HW } 10\% + \text{Midterm Exams } 25\% + 25\% + \text{Final Exam } 40\%,$$

and translated to a University of Iowa grade as follows:

Undergraduates 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]

The formula for SOA’s UEC score is: HW 20% + Final Exam 80%. To get FAM credit from the SOA, you need to achieve 85% or better in ACTS:4130 **and** in ACTS:4150. Your midterm exam marks contribute to your University of Iowa grade, but not to the SOA UEC score. The **final** examination is **cumulative** (covering material from throughout the course).

Academic Honesty and Misconduct

All students in CLAS courses are expected to abide by the [college's standards 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 DEO (Chair) of the department, school or program offering the course. Sometimes students will be referred to the department or program's Director of Undergraduate Studies (DUS) or Director of Graduate Studies (DGS). 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 Dean's Office](#) when additional support is needed.

Drop Deadline for this Course

You may drop an individual course before the drop 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. To discuss how dropping (or staying in) a course might affect your academic goals, please contact your Academic Advisor. 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 CLAS courses [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 the 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 scheduled for the same 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.*

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. For the privacy and the protection of student records, UI faculty and staff can only correspond with UI email addresses.

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 course-related concerns. For additional mental health support, please see the guidance and resources at [mentalhealth.uiowa.edu](#), including the 24-7 [UI Support and Crisis Line](#). Additionally, the Office of the Dean of Students can help students navigate personal crisis situations. They can provide one-on-one support, help with identifying options, and access to [basic needs resources \(such as food, rent, childcare, etc.\)](#). Student Care and Assistance: 132 IMU, dos-assistance@uiowa.edu, or 319-335-1162 and more info: dos.uiowa.edu/assistance

University Policies

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 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.

Free Speech and Expression

Absences for Religious Holy Days

Classroom Expectations

Non-discrimination

Sexual Harassment/Misconduct and Supportive Measures

Sharing of Class Recordings (if appropriate)