Math 419B   Actuarial Mathematics II
Winter 2017
Bouillon 210 M. W. 3:20 – 4:35

Instructor: Professor Yvonne Chueh
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Prerequisite: Math 419A or permission.

Text:

Actuarial Mathematics for Life Contingent Risks, 2nd Edition, 2013, Dickson, D., Hardy, M., Waters, H., Cambridge University Press, ISBN: 978-1-110704-407-4. Exercises are considered part of the required readings.
Math 419B Chapters 6-9; Entire Math 419 sequence covers Chapters 1-13 (Except Section 11.5)

Required supplementary material:

1. Actex manual for SOA MLC exam (Available in the university bookstore) Chapter 5,6,8,9,11
2. MLC Adapt Online class adoption quarterly subscription
   at https://www.coachingactuaries.com/Register?&productskus[0]=2016FallCWUMLCAdaptClass

ACADEMIC POLICIES & PROFESSIONAL PROTOCOL
The following policies and protocols have been established based on university policies and state and federal laws. They are equally binding for all students enrolled in each of my classes.

A. Equal Educational Opportunity:
Central Washington University seeks to provide reasonable accommodations for all qualified individuals with disabilities. Accommodations are intended to minimize the functional limitations of a disability and provide the student equal access to the educational process. Please inform me how I might support you in this regard.

B. Discrimination, Intimidation, & Harassment:
Hate speak and racist or sexist dialogue and behaviors will not be tolerated. The right of all students to equal access of the course content in an environment free of prejudice, discrimination, and harassment will be respected and upheld. All illegal behavior will be reported to the proper municipal and university authorities.
C. Professional Participation:
The nature of the course requires that each student be treated with respect, dignity, and sensitivity. While we can agree to disagree in a professional manner, all students are responsible for actively participating in all classroom activities in a positive, sensitive, and contributory manner. **Each class members' professionalism will be evaluated based on the instructor's discretion.**

Students will also be graded on their active, professional participation. **Please turn off your electronic devices completely during class session.** Be advised you will be marked down **without warning** for playing computer games, checking or looking at mobile phones, watching DVDs, talking on the phone, reading the newspaper, grading papers or projects, studying for other exams, working on other class assignments, engaging in incessant talking of a social nature, and / or (but not limited to) behaviors that disturb the learning environment for other students.

D. Attendance Policy:
Punctual attendance is required. You need to be in class to get credit. Extra credit points will be awarded to those students who do not miss class or are absent once. Absences will NOT BE EXCUSED without a published obituary or medical note from health care provider. Documentation will not be accepted until it is officially confirmed by the professor.

When you are absent, please email me by 8:00 a.m. on the date of your absence. The following are the specific attendance policy of this course.

> One informed absence – 1 point deduction
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> One uninformed absence – 1.5 points deduction
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> One late arrival within 5 minutes– 0.5 point deduction
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> One early departure within 5 minutes – 0.5 point deduction
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> One late arrival more than 5 minutes– 1 point deduction
>
> One early departure more than 5 minutes – 1 point deduction

Accumulation of 2 absences and 1 early departure/late arrival – 0 professionalism points of the final grade.

If you are an athlete and have games or practices scheduled during class, you must present appropriate documentation that will excuse you from class before the events take place. A coach or faculty member must officially confirm the documentation.

Please consider taking the class at another time if you cannot be here on a timely and consistent basis.

E. Late Assignments:
Late assignment will not be accepted. No exceptions will be made once deadlines are established. Email submission will not be accepted unless specified in the syllabus or changes made by the instructor. Even if you are absent, this policy follows true. I may allow you to submit your work by email if you provide me with a published obituary or an official medical note.

F. Academic Integrity:
All cheating, plagiarism and forgery will be referred for disciplinary action and automatically result in an "F" for the course. You are obligated to cite all electronic or bibliographic references for works that are not authored or created by you. Please use the format outlined by the American Psychological Association. If for some reason you do not have a complete reference for a document, do the best you can by providing an author, a date, a workshop site, etc. If a document has been translated, please give credit to the person whose talents made it readable to you or others.

All violations of the student code will be reported to the Department of Mathematics, College of the Sciences, Vice President for Student Affairs & other CWU departments for disciplinary action.

Grade Assessment:

1. Class Attendance (50 points)
> All students are responsible for actively participating in all classroom sessions in a positive, sensitive, and contributory manner. Please note passivity in discussion/response will be equally as noticeable as active response and discussion in class for the grading reference. In each class meeting session **(worth of 2.5 points)** observed passivity in joining whole class discussion will result in a "Zero" point on this category.

See Attendance Policy: Extra credit points will be awarded to those students who do not miss class or are absent only once. Absences will NOT BE EXCUSED without a published obituary or medical note from health care provider. Documentation will not be accepted until it is officially confirmed by the professor. **Repeated late arrivals /disappearance/early departures will result a drop of the letter grade.**

If you are an athlete and have games or practices scheduled during class, you must present appropriate documentation that will excuse you from class. Please consider taking the class at another time if you cannot be here on a timely and consistent basis.
Please be on time for class. If you are late, have the courtesy not to disrupt the learning environment.

2. Professionalism (25 points)
Punctual attendance is required as part of the **Professionalism** requirement. You need to be
 in class to earn credit.

Informal assessment on participation: We will treat each other with courtesy, cordial civil manner and sensitivity, flexibility. This "Professionalism" category refers to one's chosen actions, attitude, and choice of words in the public, during class discussion, in writings, through course assignments, in forms of communications on your grades or sharing personal opinions. This category is evaluated according to the instructor's discretion.

When class in session, electronic device of all sorts are required to ***turn off and put away out of sight***. Any of the following disruptive behaviors will result in **5%** taken off in the final grade ***each time of incident***: Playing computer games, repeated early departure, repeated disappearance, and repeated late arrival, repeated cell phone disruptions, ***electronic texting***, ***surfing internet***, reading the newspaper, grading papers or projects, studying for exams, working on other class assignments, engaging in ***incessant talking of a social nature***, and / or (but not limited to) behaviors that disturb the learning environment for other students. Points will be taken off by the instructor's discretion (No warnings given). Inappropriate and unprofessional academic behaviors will be reported to CARR (Committee for Academic Recruitment and Retention) for advisement and improvement plan.

To earn all professionalism and attendance points you must exhibit to a HIGH DEGREE the following:
- Collegial Support (5 points)
- Positive Attitude (5 points)
- Perfect Attendance (5 points)
- Active Participation (5 points)
- All materials complete & on time (5 points)

Grading policy:
- Attendance   (50 points)
- Professionalism & presentation   (50 points)
- Actex Chapter Assignments   (100 points)
- Adapt Quizzes   (100 points)
- Two Tests   (200 points)
- Final exam   (100 points)

Total: **600 points**

A perfect score on both of the above categories would result in a total of 700 points. Your course grade will be determined by the percentage **p** of these points you earn, according the following scale.

A (100-94%) A- (93-90%) B+ (89-87%) B (86-83%) B- (82-80%) C+ (79-77%)
C (76-73%)   C- (72-70%) D+ (69-67%) D (66-63%) D- (62-60%) F (59-0%)

Class format: Mixture of lectures and in-class problem solving. Students present their solutions of the assigned problems and answer any question raised by the instructor and other students.

Tentative Schedule (The Instructor reserves the right to add or drop quizzes as well as other changes necessary to move the progress forward in light of balancing student learning and course objectives. Any change will be announced in Canvas. Please check the Canvas announcement daily. You can set up an email alert to receive all the Canvas announcements daily.)

<u>Week</u>	<u>Reading Assignment</u>
1. 1/4-1/6	**Premium Calculation** *Text Reading: 6.1, 6.2, 6.5* *Actex Reading: 5.1~5.3* *Actex Exercise 5: TBA in Canvas (Due on 1/11)* *Practice Adapt Quiz (Net Premium, Equivalence Principle)*
2. 1/9-1/13	*Text reading: 6.4, 6.7* *Actex Reading 5.4~5.5* *Actex Exercise 5: TBA in Canvas (Due on 1/18)* *Adapt Quiz 1 (Due on 1/15) (Loss at issue Random Variable, Percentile Premium, Profit)*
3. 1/16-1/20	Chapter Review *Actex Exercise 5: TBA in Canvas (Due on 1/20)* *Adapt Quiz 2 (Due on 1/22) (All Premium Calculations)*
4. 1/23-1/27	**Net Premium Reserves** *Text Reading: 7.1, 7.3.1, 7.8; 7.3.3; 7.4* *Actex Reading: 6.1~6.3* *Actex Exercise 6: TBA in Canvas (Due on 1/27)* *Adapt Quiz 3 (Due on 1/29) (Prospective Reserve, Recursive Reserve)*
5. 1/30-2/3	*Text Reading: 7.7* *Actex Reading: 6.4* *Actex Exercise 6: TBA in Canvas (Due on 2/3)*

Adapt Quiz 4 (Due on 2/5) (All Net Premium Reserves)

6. 2/6-2/10   **Test 1 on Monday, 2/6**

Multiple Decrement Models: Theory
Text Reading: 8.8~8.10, 8.12
Actex Reading: 8.1~ 8.4
Actex Exercise 5: TBA in Canvas (Due on 2/10)

7. 2/13-2/17   ### Multiple Decrement Models: Applications
Text Reading: 7.6
Actex Reading: 9.1~9.4
Actex Exercise 9: TBA in Canvas (Due on 2/17)
Adapt Quiz 5 (Due on 2/19) (Multiple Decrement Models)

8. 2/20-2/24   *Actex Exercise 9: TBA in Canvas (Due on 2/22)*
Test 2 on Wednesday, 2/22

9. 2/27-3/3   ### Multiple Life Functions
Text Reading: 9.2~9.7
Actex Reading: 11.1~11.3
Actex Exercise 11: TBA in Canvas (Due on 3/3)
Adapt Quiz 6 (Due on 3/5) (Multiple Life Insurance and Annuities)

10. 3/6- 3/10   *Actex Exercise 11: TBA in Canvas (Due on 3/8)*
Review Problems (Due on 3/10)
Adapt Quiz 7 (Due on 3/12) (Multiple Life Functions)

11. 3/13-3/17   **Comprehensive Final Exam**

The **Final Exam** date will be according to the university schedule.

Optional Spreadsheet Project: You are encouraged to develop a spreadsheet application that will implement the N.S.P. formula for a variety of life insurance and life annuity contracts introduced in math 419A. Single life contracts for this winter quarter and joint lives can be in spring quarter. You should use the illustrative life table (from the MLC exam) as a first attempt since this table provides the whole life cases for every integer age on the table, thus serves a nice verification vehicle for the formulas built in the cells. You will have to input formulas for term life, whole life, and deferred life and make the calculation results accessible to your program users. This is not an isolated project but connect to your grasps of computational and conceptual techniques associated with your learning. As an option, you can also program valuation dates at fractional age under various mortality assumptions (UDD, De Moivre, Constant Force, ..etc) Over and above the intensive programming that you are involved, you are expected to come up with a theme topic (or "overarching

question") to differentiate your spreadsheet projects from your peers. An ultimate goal of your project is to share how actuarial math works via life insurance business.

The best part of student projects often lies on the learning experience and the creativity originated by you. You will receive good sense of achievement for your work well done. You are urged to present your finished project to SOURCE, a once-a-year campus event. My role would be mentoring and coaching you to handle errors or hurdles in formula comprehensions and coding. I expect it to be a significant time commitment but believe worthwhile to do.

A possible project expansion for spring may be on the benefit reserves. You may use life tables your pick from the SOA, AAA websites or internet. I can assist you with formatting the text file into the .xls spreadsheet format. Any other ideas from you are welcome and encouraged!