

# University of Illinois -Urbana Champaign

## ASRM 471: Life Contingencies 1

### Fall 2020 Course Outline

Instructor: Paa Kow Cole

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### Mode of Instruction

The course will be administered via compass and zoom. I will provide two live Zoom sections every week to further explain concepts and answer your questions. The two sections will be held on Tuesdays and Thursdays from 8:30 am to 9:30 am (Champaign Time). I entreat you all to attend the zoom sections.

### Objectives

This course aims to offer students the ability to develop actuarial techniques for valuing policies that are dependent on contingent events.

### Books

- Dickson, d., Hardy, M., Waters, R. (2013). *Actuarial Mathematics for Life Contingency Risk* (2<sup>nd</sup> Edition) Cambridge University Press  
Chapters 1,2,3,4,5, and 6
- LTAM SOA study manuals

### Required Background

- ASRM 210: Theory of Interest
- Calculus 1

### Topics

Weeks	Dates	Module	Topics
1-3	8/24-9/12	Module 1	<b>Future Lifetime Random Variable</b>

			Survival Functions Probabilities of death and survival Force of mortality Complete and Curtate future lifetime
4-5	9/13-9/26	Module 2	<b>Mortality laws-</b> Gompertz and Gompertz-Makeham laws Weibull distribution Exponential distribution Uniform distribution Beta distribution
6-7	9/27-10/10	Module 3	<b>Life tables</b> Fractional age assumptions Select mortality and Ultimate mortality Mortality trends
8-10	10/11-10/31	Module 4	<b>Insurance benefits</b> Whole life insurance Term life insurance Pure endowment Endowment assurance Deferred contracts Variable insurance
11-13	11/1-11/21	Module 5	<b>Annuities</b> Whole life annuities Term life annuities Deferred annuities Guaranteed annuities Increasing annuities Recursive formulae and
14-15	11/29-12/9	Module 6	<b>Premium calculations</b> Future loss random variable Equivalent principle of net and gross premium calculation for insurance policies and annuities The portfolio percentile Premium principles Profits

## Assessment

### Assignments -60%

### Midterm -20%

2 midterms at the end of modules 2 and 5.

### Finals – 20%

## Grading Scale

A+	97-100
A	93-96
A-	90-92
B+	87-89
B	83-86
B-	76-82
C+	70-75
C	65-69
C-	60-64
D+	55-59
D	50-54
F	<50

## Academic Integrity Statement

The University has the responsibility for maintaining academic integrity so as to protect the quality of education and research on our campus and to protect those who depend upon our integrity.

## Expectations for each student

It is the responsibility of each student to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and conduct that aids others in such infractions. Students have been given notice of this part by virtue of its publication. Regardless of whether a student has actually read this part, a student is charged with knowledge of it. Ignorance is not a defense.

Further details: <https://studentcode.illinois.edu/article1/part4/1-401/>

## Accommodation Statement

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible.

DRES Email: [disability@illinois.edu](mailto:disability@illinois.edu)

For more details visit DRES' website: <https://www.disability.illinois.edu>