King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
AS481: Actuarial Contingencies 2 Lab- Term 231 (3-2-4) 7am U

Course Objectives:

A continuation of Life Contingencies I. Development is based on a stochastic approach to insurance models. Major topics include benefit premiums and reserves, and multi-life and multiple-decrement models. Parallel treatment of topics based on Takaful system. Application of such area in life insurance and property.

Prerequisites: AS 380

Lab Manual and Package:

1. Li & Ng (2021). ACTEX Study Manual for SOA Exam LTAM. ACTEX. ISBN: 978-1-63588-929-1
2. Texas BAII Plus Calculator or Texas BAII Professional
3. MS EXCEL

Reference:

1. Camilli, S.J., Duncan, I., & London, R.L. (2014) *Models for Quantifying Risk, 6th edition*. ACTEX Publication: Winsted, USA.
2. Dickson, D.C., Hardy, M. R., & Waters, H. R. (2020) *Actuarial Mathematics for Life Contingent Risks,* 3rd edition. Cambridge University Press: Cambridge, UK.
3. Bowers N., Gerber, H., Hickman, J., Jones, D. & Nesbitt, C. (1997 or later printing) *Actuarial Mathematics*, 2nd edition. Society of Actuaries Publishing.
4. Society of Actuaries regulations for FAM(Fundamental of Actuarial Models) and ALTAM (Advanced Long Term Actuarial Models) and sample exams for FAM and ALTAM
5. Institute and Faculty of Actuaries (IFoA) CM1 professional exam

Instructor: Dr. Mohammad H. Omar **Office:** Bldg – 5, room – 508. **Phone:** 013 - 860 2471
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Office Hours: M: 2.00pm-3:00pm (office), T: 12.35pm-1.20pm (office) and R: 10am–10.50am (bldg. 24 158) or by appointment on MS Teams chat

Assessment

Assessment for this course will be based on the following:

Activity	Weight	Marks
Attendance and Lab Participation	10%	2
Lab Assignments	30%	6
Lab Tests	60%	12
Total	100%	20

Suggested Class work and Tutorial Problems
Students are encouraged to do the problems in the Lab first by hand and then by using EXCEL for the comparison of results, if any.

Tentative Syllabus, weekly coverage of material and lab tests schedule

Week	Topic	Section	Problem
Wk01 Aug 27	**Multiple Decrement Models: Theory**	Ch 8	Q1 to 10
Wk02 Sep 3	**Multiple Decrement Models: Applications**	Ch 9	Q1 to 10
Wk03 Sep 10	**Multiple Decrement Models: Applications (cont.)** Numerical calculations by EXCEL	Ch 9	Q11 to 20
Wk04 Sep 17	**Multiple State Models** **Lab Assessment 1 – Material: From the chap 8**	Ch 10 **Lab Test 1**	Q1 to 10
Wk05 Sept 24	**National Day Holiday**		
Wk06 Oct 1	**Multiple State Models (cont.)** Numerical calculations by EXCEL **Lab Assessment 2 – Material: From the chap 9**	Ch 10 **Lab Test 2**	Q11 to 16
Wk07 Oct 8	**Multiple Life Functions**	Ch 11	Q1 to 10
Wk08 Oct 15	**Multiple Life Functions (cont.)** Numerical calculations by EXCEL	Ch 11	Q11 to 20
Wk09 Oct 22	**Pension Plans and Retirement Benefits**	Ch 12	Q1 to 6
Wk10 Oct 29	**Pension Plans and Retirement Benefits (cont.)** Numerical calculations by EXCEL	Ch 12	Q7 to 16
Wk11 Nov 5	**Profit Testing** **Lab Assessment 3 – Material: From Chap 10 and 11**	Ch 13 **Lab Test 3**	Q1 to 6

Wk12 Nov 12	**Profit Testing (cont.)** Numerical calculations by EXCEL	Ch 13	Q7 to 13
Nov. 19	**Midterm Break**		
Wk13 Nov 26	**Mortality Improvement Modeling**	Ch 15	Q1 to 6
Wk14 Dec 4	**Mortality Improvement Modeling (cont.)** Numerical calculations by EXCEL **Lab Assessment 4 – Material Covered: Ch 12 and 13**	Ch 15 **Lab Test 4**	Q7 to 16
Wk15 Dec 11	**Health Benefits**	Ch 16	Q1 to 6
Wk16 Dec 17	**LTAM Oct 2019**	S-191	Q1 to 10