هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission
اعتماد
NCAAA
2024
TP-153

Course Specification

(Bachelor)

Course	**Actuarial Mathematics Lab (1)**
Course Code:	**AFM 1344**
Program:	**Bachelor of Science in Actuarial and Financial Mathematics**
Department:	**Mathematics and Statistics**
College:	**Science**
Institution:	**Imam Mohammad Ibn Saud Islamic University**
Version:	**2024 – V1**
Last Revision Date:	**None**

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours:					
1 (0 Lecture, 2 Labs, 0 Tutorials)					
2. Course type					
A.	☐University	☐College	☒ Program	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (Level 6 / Year 3)					
4. Course general Description:					
This course is designed to prepare students: - **For the Actuarial Models examination of the Society of Actuaries and the Casualty Actuarial Society.** - **For the use of statistical and mathematical packages for problem solving practice in actuarial models.**					
5. Pre-requirements for this course (if any)**:**					
MAT 1244.					
6. Co-requisites for this course (if any)**:**					
None.					
7. Course Main Objective(s):					
• **To get familiar with SOA and CAS examinations.** • **To easily understand and appreciate the practicability of the concepts of life insurance.** • **To develop the ability to properly analyze and solve long-term actuarial problems, and reasonably interpret their results.** • **To learn how to use statistical and mathematical packages in solving a wide range of actuarial problems in the real world, including life insurance and life annuities contracts.**					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	**30**	**100%**
2	E-learning	**0**	**0%**
3	Hybrid • Traditional classroom • E-learning	**0**	**0%**
4	Distance learning	**0**	**0%**

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	**0**
2.	**Laboratory/Studio**	**30**
3.	**Field**	**0**
4.	**Tutorial**	**0**
5.	**Others (specify)**	**0**
Total		**30**

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	**Describe survival models and survival distributions.**	**K2, K3**	**Lab**	**Direct: Lab reports Midterm and final exam**
1.2	**Define how to calculate premiums for some contracts.**	**K2, K3**	**Lab**	**Direct: Lab reports Midterm and final exams**
2.0	**Skills**			
2.1	**Apply techniques in life annuities calculation.**	**S1**	**Problem solving Quizzes Midterm and final exams**	**Direct: Problem solving Quizzes Midterm and final exams**
2.2	**Analyze portfolios.**	**S3**	**Problem solving Quizzes Midterm and final exams**	**Direct: Problem solving Quizzes Midterm and final exams**
2.3	**Create life tables in computing premiums.**	**S1**	**Problem solving Quizzes Midterm and final exams**	**Direct: Problem solving Quizzes Midterm and final exams**
3.0	**Values, autonomy, and responsibility**			
3.1	**Construct ethical behavior and respect different points of view.**	**V1**	**Personal questions**	**Direct: Participation**
3.2	**Debate effectively in teams.**	**V1**	**Teamwork and class discussions.**	**Direct: Homework and Mini projects**

C. Course Content

No	List of Topics	Contact Hours
1.	**SOA and CAS examinations in Actuarial Mathematics.**	**15**
2.	**Practice in tools of actuarial mathematics:** Survival models, life tables, life annuities, premium calculation, net premium reserve.	**15**
Total		**30**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	**Homework, Quizzes, Mini projects**	**During the term**	**10%**
2.	**First Midterm**	**Week 5-6**	**25%**
3.	**Second Midterm (Lab Exam)**	**Week 10-11**	**25%**
4.	**Final Exam**	**Week 16**	**40%**

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	**Dickson, D.C., Hardy, M. R., & Waters, H. R., Actuarial Mathematics for Life Contingent Risks, Cambridge University Press, Cambridge, UK, 2020.**
Supportive References	MATLAB: MATLAB is commonly used for actuarial modeling and financial problem-solving. Students may need to use MATLAB for assignments and projects. R or Python: Some courses introduce students to programming languages like R or Python, which are valuable for data analysis and modeling in actuarial work.
Electronic Materials	None
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Each classroom should be equipped with computers, a whiteboard, and a projector. Laboratories should be equipped with computers and an internet connection.**

Items	Resources
Technology equipment (projector, smart board, software)	**The rooms should be equipped with data show and Smart Board.**
Other equipment (depending on the nature of the specialty)	**None**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	**Students**	**During the semester and at the end of the course each student will complete two evaluation forms.**
Effectiveness of Students' assessment	**Instructor**	**At the end of each semester the course instructor should complete the course report, including a summary of student questionnaire responses appraising progress and identifying changes that need to be made if necessary.**
Quality of learning resources	**Students**	**During the semester and at the end of the course each student will complete two evaluation forms.**
The extent to which CLOs have been achieved	**Instructor**	**At the end of each semester the course instructor should complete the course report, including a summary of student questionnaire responses appraising progress and identifying changes that need to be made if necessary.**
Other	**None**	

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

Council / Committee	**MATHEMATICS AND STATISTICS DEPARTMENT COUNCIL**
Reference No.	**8/1446**
Date	**05/04/1446 (08/10/2024)**