جامعة البحرين
University of Bahrain
مركز ضمان الجودة والاعتماد الأكاديمي
Quality Assurance and Accreditation Center

Academic Course Specification Form

استمارة توصيف المقرر الأكاديمي

القسم الخاص بالطالب
Section Concerning the Student

1. Course Code:	**MATHS 474**	**1. رمز المقرر:**
2. Course Title	**Loss Models II**	**2. اسم المقرر:**
3. College:	College of Science	**3. الكلية:**
4. Department:	Department of Mathematics	**4. القسم:**
5. Academic Program:	**B.Sc. in Actuarial Science**	**5. البرنامج الأكاديمي:**
6. Course Credits:	3-0-3	**6. عدد الساعات المعتمدة:**
7. Course NQF Level	8	**7. مستوى المقرر وفقا للإطار الوطني للمؤهلات:**
8. Notional Hours:	133	**8. عدد الساعات الافتراضية:**
9. NQF Credits	13	**9. عدد الساعات المعتمدة للمقرر وفقا للإطار الوطني للمؤهلات:**
10. Prerequisite:	MATHS 473	**10. المتطلب المسبق للمقرر:**
11. Lectures Timing & Location:	TBA	**11. وقت المحاضرة ومكانها:**
12. General Mode of Teaching and Learning	Tranditional تقليدي	**12. النمط العام للتعليم والتعلّم:**
13. Course Coordinator:	TBA	**13. منسق المقرر:**
14. Course Instructor:	TBA	**14. مدرس المقرر:**
15. Office Hours and Location:	TBA	**15. الساعات المكتبية ومكانها:**
16. Instructor's Email:	TBA	**16. البريد الإلكتروني لمدرس المقرر:**
17. Academic Year:		**17. السنة الأكاديمية:**
18. Semester:	First Semester الفصل الأول	**18. الفصل الدراسي:**

19. Textbook(s):	19. الكتب الدراسية للمقرر:
■ Loss Models: From Data to Decisions, (Fifth Edition), 2019, by Klugman, S.A., Panjer, H.H. and Willmot, G.E., Wiley, ISBN: 978-1-119-52378-9 ■ Introduction to Ratemaking and Loss Reserving for Property and Casualty Insurance, 2020, (Fourth Edition), Brown, Robert L., Robert L. Brown, and Leon R. Gottlieb, Winsted, Connecticut : ACTEX Publications, Inc, ISBN 13-9781625424747	
20. References:	**20. المراجع:**
21. Other learning resources used (e.g. e-Learning, field visits, periodicals, software, etc.):	**21. مصادر أخرى (مثال : التعلم الالكتروني، زيارات ميدانية، دورات، برامج كمبيوتر، الخ....)**
■ **SOA Notes:** FAM-25-18 Individual Health Insurance (Second Edition), 2015, by Bluhm and Leida, Chapter 2, Sections 2.1, 2.9 ▪ ASTAM-21-23: Outstanding Claims Reserves, 2022, Hardy, M.R. ▪ ASTAM-22-23: Chapter 5 of Quantitative Enterprise Risk Management, 2022, by Hardy, M.R. and Saunders, D. Cambridge University Press, ISBN: 978-1009098465 ▪ Notation and Terminology used on Exam ASTAM ▪ ASTAM Formula Sheet ▪ Sample questions and solutions ▪ Corrections and Comments for Loss Models, Fifth Edition ■ **ACTEX E-learning:** https://www.actexmadriver.com/goal/ ■ **Infinite Actuaries:** https://www.theinfiniteactuaries.com ■ **Coaching Actuaries:** https://coachingactuaries.com) ■ No particular e-learning tool is assigned to the course. Students are free to use one of their choices. However, any formula that differs from the assigned textbook needs to be justified for written answer questions.	
22. Course Description (as published in the College Catalogue):	**22. توصيف المقرر(حسبما ورد في دليل الكلية):**
This course is a continuation of the study of actuarial models. Topics include estimation of data, parameter estimation, model selection, and credibility.	
1. Course Intended Learning Outcomes (3 to 5 CILOs):	**23. مخرجات التعلّم للمقرر (CILOs) (3 إلى 5 مخرجات تعلّمية):**
1. Construct different methods of estimation for loss models	
2. Formulate frequentist and Bayesian estimations	
3. Analyze models for selection purposes	
4. Calculate premium using credibility procedure	
5. Apply methods of ratemaking and reserving for short-term insurance coverage	
23. Course Assessment Percentages (As per Regulations of Study and Examination at the University of Bahrain):	**24. أساليب التقويم ونسبها المئوية (بحسب نظام الدراسة والامتحانات في جامعة البحرين):**
ASSIGNMENTS	20%
TEST#1	20%
TEST#2	20%
EXAM	40%
Total	**100%**
⚠ There should be at least two assignments per semester so that each won't exceed 10% of the total course grade.	

24. Description of Topics Covered:	25. وصف الموضوعات التي ينبغي تناولها:
Topic Title ***(e.g. chapter/experiment title)*** الموضوع	***Description*** التفصيل
Book 1: Ch. 11, 12, 13, and 18: Maximum Likelihood Estimation, Frequentist and Bayesian Estimation	Distribution Parameters Estimation by the method of Maximum Likelihood; Frequentist and Bayesian Estimation; Empirical Bayes Parameter Estimations
Book 1: Ch. 15: Model Selection	Model Representation, Hypothesis Testing and Selection
Book 1: Ch. 17: Greatest Accuracy Credibility (Ch. 16 Read only)	Risk characteristics distribution, Credibility and Bayesian premium estimation, Credibility Models (Bühlmann, Bühlmann-Straub)
Book 2: Rate Making and Loss Reserving (Reading and Workshops)	Book 2: Introduction to Ratemaking and Loss Reserving for Property and Casualty Insurance

25. Weekly Schedule				26. الجدول الأسبوعي:
Week الإسبوع	Date التاريخ	Topics Covered المواضيع المعروضة	CILOs المخرجات التعلُمية للمقرر (CILOs)	Teaching/Assessment Mode and Method منهجية ونمط التدريس/التقييم
01		Ch. 11: Maximum Likelihood Estimation 11.1 Introduction 11.5 Variance and Interval Estimation for Maximum Likelihood Estimators	1	Traditional Teaching تدريس تقليدي
02		11.6 Functions of Asymptotically Normal Estimators 11.7 Nonnormal Confidence Intervals	1	
03		Ch. 12: Frequentist Estimation for Discrete Distributions 12.4 The $(a, b, 1)$ Class	1	
04		Ch. 13: Bayesian Estimation 13.1 Definitions and Bayes' Theorem 13.2 Inference and Prediction 13.3 Conjugate Prior Distributions and the Linear Exponential Family 13.4 Computational Issues	2	
05		Ch. 15: Model Selection 15.1 Introduction 15.2 Representations of the Data and Model 15.4 Hypothesis Tests (Part 1) The Anderson-Darlin Test is excluded.	2	
06		15.4 Hypothesis Tests (Part 2) 15.5 Selecting a Model: Read Only	2	
07		Ch. 17: Greatest Accuracy Credibility 17.1 Introduction 17.2 Conditional Distributions and Expectation	3	
08		17.3 The Bayesian Methodology	3	
09		17.4 The Credibility Premium	4	
10		17.5 The Bühlmann Model 17.6 The Bühlmann–Straub Model	4	
11		17.7 Exact Credibility Ch. 18: Empirical Bayes Parameter Estimation 18.1 Introduction	4	
12		18.2 Nonparametric Estimation 18.3 Semiparametric Estimation	5	
13		Book 2: Introduction to Ratemaking and Loss Reserving for Property and Casualty Insurance (Reading and Workshops) Ch. 3: (Sections 6, 7): Reading and Workshop	5	
14		Ch. 3: (Sections 6, 7): Reading and Workshop	5	
15		Ch. 4 (Section 8): Reading and Workshop Ch. 5: (Sections 3, 4): Reading and Workshop	5	

26. Academic Integrity Statement:	27. بيان النزاهة الأكاديمية:
Students are to observe the highest level of honesty and academic ethics in pursuit of their academic goals as per UOB Regulations of Student Conduct and Academic Integrity, Anti-plagiarism Policies, and Students' Rights and Responsibilities Handbook. The consequences for cheating, plagiarism, unauthorized collaboration, and other forms of academic dishonesty can be very serious and will be dealt with as per the aforementioned policies and regulations.	يعتبر الصدق والنزاهة عنصران أساسيان في العملية الأكاديمية. حيث يُتوقع من الطلاب خلال سعيهم لتحقيق أهدافهم الأكاديمية التحلي بالأمانة والأخلاق في جميع الأوقات، وذلك وفقًا للوائح والأنظمة الخاصة بطلبة جامعة البحرين، بالإضافة إلى دليل حقوق الطلبة وواجباتهم، وكما جاء في سياسة الانتحال الخاصة بجامعة البحرين. حيث سيتم التعامل مع أي انتهاك للنزاهة الأكاديمية بحسب ما تنص عليه السياسات والأنظمة السابق ذكرها.
27. Attendance and Absence Regulations:	**28. نظام الحضور والغياب:**
Students are required to adhere to regular attendance for class lectures and practical sessions, as determined by the nature of the course, as per Article (33), of Regulations of Study and Examination at the University of Bahrain.	يُتوقع من الطلاب الالتزام بالحضور المنتظم للساعات الصفية والعملية بحسب طبيعة المقرر، وفقًا للمادة (33)، من نظام الدراسة والامتحانات في جامعة البحرين.