



Form: Course Syllabus	Form Number	EXC-01-02-02A
	Issue Number and Date	2/3/24/2022/2963 05/12/2022
	Number and Date of Revision or Modification	
	Deans Council Approval Decision Number	2/3/24/2023
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1.	Course Title	Risk Theory
2.	Course Number	0301376
3.	Credit Hours (Theory, Practical)	3
	Contact Hours (Theory, Practical)	3
4.	Prerequisites/ Corequisites	0341331
5.	Program Title	B.Sc.
6.	Program Code	
7.	School/ Center	Science
8.	Department	Mathematics
9.	Course Level	Elective Specialization requirement
10.	Year of Study and Semester (s)	3 rd or 4 th year, 1 st and 2 nd or summer semester
11.	Other Department(s) Involved in Teaching the Course	None
12.	Main Learning Language	English
13.	Learning Types	<input checked="" type="checkbox"/> Face to face learning <input type="checkbox"/> Blended <input type="checkbox"/> Fully online
14.	Online Platforms(s)	<input checked="" type="checkbox"/> Moodle <input checked="" type="checkbox"/> Microsoft Teams
15.	Issuing Date	6/11/2024
16.	Revision Date	

17. Course Coordinator:

Name: Amal Helu	Contact hours: 10:30-11:30 am
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18. Other Instructors:

Name:
Office number:
Phone number:
Email:
Contact hours:
Name:
Office number:
Phone number:
Email:
Contact hours:

19. Course Description:

This course introduces the fundamental concepts and techniques in the design and analysis of experiments. Emphasis is placed on understanding the structure of experiments, selecting appropriate designs, and analyzing experimental data using statistical methods. The topics include various ANOVA designs, factorial experiments, and their applications in real life.

20. Program Student Outcomes (SO's):

(To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program)

SO1: Identify, formulate, and solve broadly-defined technical or scientific problems by applying knowledge of Mathematics and Science and/or technical topics to areas relevant to the discipline

SO5: Reflect the impact of technical and/or scientific solutions in economic, environmental, and societal contexts.

21. Course Intended Learning Outcomes (CLO's):

(Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

1. Introduce fundamental distributional concepts in risk analysis.
2. Develop an understanding of parameter effects on risk distributions.
3. Classify and apply probability distributions relevant to risk theory.
4. Explore the impact of insurance modifications and external factors on losses.
5. Apply compound models to aggregate claims and assess tail risk



Course CLOs	The learning levels to be achieved					
	Remembering	Understanding	Applying	Analysing	evaluating	Creating
CLO (1)	✓	✓	✓			
CLO (2)		✓		✓		
CLO (3)	✓	✓	✓	✓		
CLO (4)		✓	✓	✓	✓	
CLO (5)		✓	✓	✓	✓	

22. The matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program:

Program SO's Course CLO's	SO (1)	SO (2)	SO (3)	SO (4)	SO (5)	SO (6)	SO (7)	SO (8)
	CLO (1)	✓				✓		
CLO (2)	✓				✓			
CLO (3)	✓				✓			
CLO (4)	✓				✓			
CLO (5)	✓				✓			

23. Topic Outline and Schedule:

Week	Topic	CLO/s Linked to the Topic	Learning Types Face to Face (FF) Blended (BL) Fully Online (FO)	Platform Used	Synchronous (S) Asynchronous (A)	Evaluation Methods	Learning Resources
1-2	Calculate basic distributional quantities: moments, percentiles, and generating functions.	1,2,3	FF		S	Quiz, Discussion	Notes, Textbook Ch. 1, Articles



	Describe how changes in parameters affect the distribution Recognize classes of distributions and their relationships.						
3-4	Identify the applications in which each distribution is used and the reasons why. Apply the distribution to an application, given the parameters. Calculate various measures of tail weight and interpret the results to compare the tail weights Evaluate the impacts of coverage modifications such as: deductibles, limits, coinsurance.	3,4,5	FF		S	Quiz, Assignment	Notes, Textbook Ch. 2
5-6	Calculate Loss Elimination Ratios. Evaluate compound models for aggregate claims. Evaluate effects of inflation on losses. Identify the applications for which each distribution is used and the reasons why.	4,5	FF		S	Test 1	Notes, Textbook Ch. 3
7-8	Apply the distribution to an application, given the parameters. Calculate various measures of tail weight and interpret the results to compare the tail weights. Identify and describe two extreme value distributions.	3,5	FF		S	Quiz, Exercise	Notes, Textbook Ch. 4



9-11	<p>Frequency Models For the Poisson, Mixed Poisson, Binomial, Negative Binomial, Geometric distribution and mixtures thereof:</p> <p>a) Describe how changes in parameters affect the distribution.</p> <p>b) Calculate moments. Identify the applications for which each distribution is used and the reasons why.</p> <p>Inviting an expert from a bank or insurance company to speak to students about potential job opportunities within their field of study.</p>	1,2,3	FF		S	Quiz, Assignment	Notes, Textbook Ch. 5
12-13	<p>Aggregate Models</p> <p>1. Compute relevant parameters and statistics for collective risk models.</p> <p>2. Evaluate compound models for aggregate claims.</p> <p>3. Compute aggregate claims distributions.</p>	5	FF		S	Test 2	Notes, Articles
14-15	<p>For severity, frequency, and aggregate models</p> <p>1. Evaluate the impacts of coverage modifications: Deductibles, Limits, Coinsurance.</p> <p>2. Calculate Loss Elimination Ratios.</p> <p>3. Evaluate the effects of inflation on losses.</p>	4	FF		S	Project	Notes, Textbook Ch. 6
16						Final Exam	

**24. Evaluation Methods:**

Opportunities to demonstrate achievement of the CLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	CLO/s Linked to the Evaluation activity	Period (Week)	Platform
Pop Quizzes	5%	Various Topics	1,2,3,4,5	Weekly	Classroom
Test 1	20%	Chapters 1,2	1,2,3	Week 6	Classroom
Test 2	20%	Chapters 3,4, 5	1,2,3,4,5	Week 13	Classroom
Project	5%	Chapter 5	1,2,5	Week 14	Classroom

25. Course Requirements:

Account on Microsoft Teams.

26. Course Policies:

1. All cell phones must be turned off during class. Phones cannot be used during class, even as calculators, to check your answers. Earphones or earbuds may not be used during quizzes, tests, or exams. Texting and browsing the web on phones are not allowed.
2. The questions must be directed to the instructor during the lecture. Disrespectful or disruptive behavior will not be tolerated.
3. If you are late to class or need to leave early, enter and leave the room quietly.
4. Please come to class prepared to participate. Please be courteous to your classmates and keep extra noise to a minimum.
5. Appeal of grading should be submitted in writing within 5 days of receiving the evaluation.
6. Students are responsible for all announcements and supplements given within any lecture.
7. Cheating and plagiarism will not be tolerated. Please see the University of Jordan student Handbook for the definition of cheating and plagiarism and the severe consequences of such behaviors.
8. Food and drink are not allowed in the classroom except bottled water.
9. No guests are allowed in class.

**27. References:**

Textbook: Loss model from data to decisions by Klugman.

28. Additional information:

1. Do not miss any classes.
2. Print out and review the lecture notes before each class.
3. Take notes directly on the printed materials.
4. Collaborate in groups of two or more.
5. If you are experiencing significant difficulties, please see me or make an appointment right away.

Name of the Instructor or the Course Coordinator: Prof. Amal Helu	Signature:	Date: 6/11/2024
Name of the Head of Quality Assurance Committee/ Department: Prof. Manal Ghanem	Signature:	Date:
Name of the Head of Department: Prof. Baha Alzalg.	Signature:	Date:
Name of the Head of Quality Assurance Committee/ School of Science: Prof. Emad A. Abuosba	Signature:	Date:
Name of the Dean or the Director: Prof. Mahmoud I. Jaghoub	Signature:	Date: