Spring 2024

MATH 356-002: Loss Models

S. Mahmood

MATH 356: Loss Models
Spring 2024 Course Syllabus

NJIT Academic Integrity Code: All Students should be aware that the Department of Mathematical Sciences takes the University Code on Academic Integrity at NJIT very seriously and enforces it strictly. This means that there must not be any forms of plagiarism, i.e., copying of homework, class projects, or lab assignments, or any form of cheating in quizzes and exams. Under the University Code on Academic Integrity, students are obligated to report any such activities to the Instructor.

Please be sure you read and fully understand our DMS Online Exam Policy.

COURSE INFORMATION

Course Description: This course will introduce a variety of frequency, severity, and aggregate models that are useful for actuarial applications. This will include analyzing data from applications, determining a suitable model, providing measures of confidence for decisions based on the model, and estimating losses.

Number of Credits: 3

Prerequisites: MATH 341 with a grade of C or better.

Course-Section and Instructors:

Course-Section	Instructor
Math 356-002	Professor S. Mahmood

Office Hours for All Math Instructors: Spring 2024 Office Hours and Emails

Required Textbook:

Title	*Loss Models from Data to Decisions*
Author	Klugman, Panjer, Willmot
Edition	5th
Publisher	Wiley
ISBN #	978-1119523789

University-wide Withdrawal Date: The last day to withdraw with a **W** is **Monday, April 1, 2024**. It will be strictly enforced.

POLICIES

DMS Course Policies: All DMS students must familiarize themselves with, and adhere to, the Department of Mathematical Sciences Course Policies, in addition to official university-wide policies. DMS takes these policies very seriously and enforces them strictly.

Grading Policy: The final grade in this course will be determined as follows:

Homework/Quizzes	15%
Exam I	25%
Exam II	25%
Final Exam	35%

Your final letter grade will be based on the following tentative curve.

A	90 - 100	**C**	65 - 74
B+	85 - 89	**D**	55 - 64
B	80 - 84	**F**	0 - 54
C+	75 - 79		

Attendance Policy: Attendance at all classes will be recorded and is **mandatory**. Please make sure you read and fully understand the Math Department's Attendance Policy. This policy will be strictly enforced.

Homework: Integrity – Your work is expected to be your own. Help from tutors, classmates etc is encouraged but you are responsible for mastering the material. Homework will be assigned at all classes.

Quiz Policy: There will be announced quizzes periodically. There are no makeup quizzes.

Exams: There will be two exams held in class during the semester and one comprehensive final exam. The final exam will be held during the following week:

Exam I	Feb 22, 2024
Exam II	Apr 4, 2024
Final Exam Period	May 3 - May 9, 2024

The final exam will test your knowledge of all the course material taught in the entire course. Make sure you read and fully understand the Math Department's Examination Policy. This policy will be strictly enforced.

Makeup Exam Policy: There will be **NO MAKE-UP QUIZZES OR EXAMS** during the semester. In the event an exam is not taken under rare circumstances where the student has a legitimate reason for missing the exam, the student should contact the Dean of Students office and present written verifiable proof of the reason for missing the exam, e.g., a doctor's note, police report, court notice, etc. clearly stating the date AND time of

the mitigating problem. The student must also notify the Instructor that the exam will be missed.

Cellular Phones: All cellular phones and other electronic devices must be switched off during all class times.

ADDITIONAL RESOURCES

Math Tutoring Center: Located in the Central King Building, Lower Level, Rm. G11 (See: Spring 2024 Hours)

Further Assistance: For further questions, students should contact their instructor. All instructors have regular office hours during the week. These office hours are listed on the Math Department's webpage for Instructor Office Hours and Emails.

Accommodation of Disabilities: The Office of Accessibility Resources and Services (OARS) offers long term and temporary accommodations for undergraduate, graduate and visiting students at NJIT.

If you are in need of accommodations due to a disability please If you need an accommodation due to a disability please contact the Office of Accessibility Resources and Services at oars@njit.edu. The office is located in Kupfrian Hall, Room 201. A Letter of Accommodation Eligibility from the Office of Accessibility Resources and Services office authorizing your accommodations will be required.

For further information regarding self identification, the submission of medical documentation and additional support services provided please visit the Office of Accessibility Resources and Services (OARS) website at:

https://www.njit.edu/accessibility/

Important Dates (See: Spring 2024 Academic Calendar, Registrar)

Date	Day	Event
January 16, 2024	Tuesday	First Day of Classes
January 22, 2024	Monday	Last Day to Add/Drop Classes
March 10, 2024	Sunday	Spring Recess Begins
March 16, 2024	Saturday	Spring Recess Ends
March 29, 2024	Friday	Good Friday - No Classes
April 1, 2024	Monday	Last Day to Withdraw
April 30, 2024	Tuesday	Friday Classes Meet
April 30, 2024	Tuesday	Last Day of Classes
May 1, 2024	Wednesday	Reading Day 1
May 2, 2024	Thursday	Reading Day 2
May 3 - May 9, 2024	Friday to Thursday	Final Exam Period

Course Outline

	Chapter	Topic
1	Chapter 2	Random Variables
2	Chapter 3	Basic Distributional Quantities
3	Chapter 3	Basic Distributional Quantities
4	Chapter 4	Characteristics of Actuarial Models
5	Chapter 5	Continuous Models
6	Chapter 5	Continuous Models
7	Chapter 6	Discrete Distributions
8	Chapter 6	Discrete Distributions
9	Chapter 8	Frequency and Severity with Coverage Modifications
10	Chapter 8	Frequency and Severity with Coverage Modifications
11	*Review for Exam I*	
12	***Exam I***	
13	Chapter 8	Frequency and Severity with Coverage Modifications
14	Chapter 8	Frequency and Severity with Coverage Modifications
15	Chapter 9	Aggregate Loss Models
16	Chapter 9	Aggregate Loss Models
17	Chapter 9	Aggregate Loss Models
18	Chapter 11	Maximum Likelihood Estimation
19	Chapter 11	Maximum Likelihood Estimation
20	Chapter 11	Maximum Likelihood Estimation
21	*Review for Exam II*	
22	***Exam II***	
23	Chapter 12	Frequentist Estimation for Discrete Distributions
24	Chapter 13	Bayesian Estimation
25	Chapter 13	Bayesian Estimation
26	Chapter 15	Model Selection
27	Chapter 15	Model Selection
28	*Review for Final Exam*	

Updated by Professor S. Mahmood -12/07/2023