

THE DEPARTMENT OF MATHEMATICAL SCIENCES

MATH 659: Survival Analysis

Fall 2025 Course Syllabus

NJIT Academic Integrity Code: Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: NJIT Academic Integrity Code.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu

COURSE INFORMATION

Course Description: Introduction to statistical methods for modeling time-to-event data in the presence of censoring and truncation, with emphasis on applications to the health sciences. Topics include survival and hazard functions, censoring and truncation, parametric and nonparametric models for survival data, competing-risks, regression models including Cox proportional hazards model and time-dependent covariates, one and two sample tests, and use of appropriate statistical software for computations.

Number of Credits: 3

Prerequisites: MATH 665 or equivalent with Departmental approval.

Course-Section and Instructors:

Course-Section	Instructor
Math 659-101	S. Subramanian

Office Hours for All Math Instructors: Fall 2025 Office Hours and Emails

Required Textbook:

Title	<i>Applied Survival Analysis using R</i>
Author	Dirk F. Moore
Edition	1st

Publisher	Springer
ISBN #	9783319312439

University-wide Withdrawal Date: The last day to withdraw with a W is **Monday, November 10, 2025**. It will be strictly enforced.

COURSE GOALS

Course Objectives

Statistical techniques for analyzing censored time-to-event data.

Course Outcomes

On successful completion, a student will be able to demonstrate understanding and knowledge of the following topics:

- 1) Basic principles of survival analysis
- 2) Nonparametric survival curve estimation
- 3) Nonparametric comparison of survival distributions
- 4) Regression analysis using the proportional hazards model
- 5) Model selection and interpretation
- 6) Model diagnostics
- 7) Parametric survival models

Course Assessment: Will be based on homework, one midterm exam, one project, and one final exam.

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	20%
Midterm Exam plus Project	50%
Final Exam	30%

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

A	90 - 100	C	68 - 74
B+	85 - 89	D	50 - 67

B	80 - 84	F	0 - 49
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.

Religious Observance: NJIT is committed to supporting students observing religious holidays. Students must notify their instructors in writing of any conflicts between course requirements and religious observances, ideally by the end of the second week of classes and no later than two weeks before the anticipated absence.

Homework: Homework assignments are due within a week unless announced otherwise by the instructor. Late homework will not be accepted.

Exams: One midterm and one comprehensive final examination as shown below.

Midterm Exam	Thursday, October 23, 2025
Final Exam Period	Dec 14, 2025 to Dec 20, 2025

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 Math Department Office/Instructor that the exam will be missed.

AI usage policy: AI usage is not permitted in this course for solving problems in class/homework assignments, quizzes, and exams. For project reports, if AI tools are used, AI-generated content must be properly cited, indicating the specific AI tool used and should not be submitted as original work. Any violations will be dealt with according to the NJIT's academic integrity policy.

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

ADDITIONAL RESOURCES

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 need an accommodation due to a disability, please contact the Office of Accessibility Resources and Services at oars@njit.edu, or visit Kupfrian Hall 201 to discuss your specific needs. A Letter of Accommodation Eligibility from the office authorizing student accommodations is 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:

Important Dates (See: [Fall 2025 Academic Calendar, Registrar](#))

Date	Day	Event
September 1, 2025	Monday	Labor Day
September 2, 2025	Tuesday	First Day of Classes
September 8, 2025	Monday	Last Day to Add/Drop Classes
November 10, 2025	Monday	Last Day to Withdraw
November 25, 2025	Tuesday	Thursday Classes Meet
November 26, 2025	Wednesday	Friday Classes Meet
November 27 to November 30, 2025	Thursday to Sunday	Thanksgiving Recess - Closed
December 11, 2025	Thursday	Last Day of Classes
December 12, 2025	Friday	Reading Day 1
December 13, 2025	Saturday	Saturday Classes Meet
December 14 to December 20, 2025	Sunday to Saturday	Final Exam Period

Course Outline

Week	Lecture	Chapter	Topic
1	9/4	2 & 10	Basic principles of survival analysis; Parametric survival models
2	9/11	3 & 10	Parametric models; Nonparametric survival curve estimation
3	9/18	3	Nonparametric survival curve estimation
4	9/25	3	Nonparametric survival curve estimation
5	10/2		
6	10/9	4	Nonparametric comparison of survival distributions
7	10/16	4	Nonparametric comparison of survival distributions; Review for exam
8	10/23		MIDTERM EXAM, OCTOBER 23, 2025
9	10/30	5	Regression analysis using the proportional hazards model
10	11/6	5	Regression analysis using the proportional hazards model
11	11/13	6	Model selection and interpretation
12	11/20	7	Model diagnostics
13	11/25	11	Sample size determination for survival studies
14	12/4		Project presentations

*Updated by S. Subramanian - 2025
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