MATH 659: Survival Analysis
Fall 2022 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.

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	Professor S. Subramanian

Office Hours for All Math Instructors: Fall 2022 Office Hours and Emails

Required Textbook:

Title	*Applied Survival Analysis using R*
Author	Dirk F. Moore
Edition	1st
Publisher	9783319312439
ISBN #	Springer

University-wide Withdrawal Date: The last day to withdraw with a **M** is **Monday, November 14, 2022**. 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
8) Sample size determination for survival studies

Course Assessment: Will be based on homework, one midterm exam, 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	30%
Midterm Exam	35%
Final Exam	35%

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.

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

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

Midterm Exam	October 27, 2022
Final Exam Period	December 16 – 22, 2022

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.

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 are in need of accommodations due to a disability please contact Scott Janz, Associate Director of Disability Support Services at 973-596-5417 or via email at scott.p.janz@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.

Important Dates (See: Fall 2022 Academic Calendar, Registrar)

Date	Day	Event
September 5, 2022	Monday	Labor Day
September 6, 2022	Tuesday	First Day of Classes
September 12, 2022	Monday	Last Day to Add/Drop Classes
November 14, 2022	Monday	Last Day to Withdraw
November 22, 2022	Tuesday	Thursday Classes Meet
November 23, 2022	Wednesday	Friday Classes Meet

November 24 to November 25, 2022	Thursday and Friday	Thanksgiving Recess - Closed
November 26, 2022	Saturday	Saturday Classes Meet
December 14, 2022	Wednesday	Last Day of Classes
December 15, 2022	Thursday	Reading Day
December 16 to December 22, 2022	Friday to Thursday	Final Exam Period

Course Outline

Week	Lecture	Chapter	Topic
1	9/8	2	Basic principles of survival analysis
2	9/15	3	Nonparametric survival curve estimation
3	9/22	3	Nonparametric survival curve estimation (completed)
4	9/29	4	Nonparametric comparison of survival distributions
5	10/6	5	Regression analysis using the proportional hazards model
6	10/13	5	Regression analysis using the proportional hazards model (continued)
7	10/20	5	Regression analysis using the proportional hazards model (completed)
8	10/27		MIDTERM EXAM
9	11/03	6	Model selection and interpretation
10	11/10	7	Model diagnostics
11	11/17	10	Parametric survival models
12	11/22	11	Parametric survival models
13	12/01	11	Sample size determination for survival studies (completed)
14	12/08		Review

Updated by Professor S. Subramanian - 8/17/2022
Department of Mathematical Sciences Course Syllabus, Fall 2022