THE DEPARTMENT OF MATHEMATICAL SCIENCES

MATH 451-H02: Methods of Applied Mathematics II (Capstone II)
Spring 2021 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: Small teams of students conduct research projects under the guidance of faculty members who perform applied research. Effective From: Spring 2009.

Number of Credits: 3

Prerequisites: Math 450H with a grade of C or better.

Course-Section and Instructors

Course-Section	Instructor
Math 451-H02	Professor C. Diekman

Office Hours for All Math Instructors: Spring 2021 Office Hours and Emails

Required Textbook:

Text	There is no mandatory text required
Coruse Materials	Textbook chapters and journal papers will be provided.

University-wide Withdrawal Date: The last day to withdraw with a **W** is **Monday, April 5, 2021**. 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:

Attendance and In-Class Participation		10%	
Homework		25%	
Midterm Project Report and Presentation		30%	
Final Project Report and Presentation		35%	

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

A	86 - 100	C	56 - 65
B+	81 - 85	D	46 - 55
B	71 - 80	F	0 - 45
C+	66 - 70		

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. AttendanceNote

Course Topics: Mathematical epidemiology, compartmental models, between-host dynamics, within-host dynamics, immune system response, age-structured populations, spatial spread of epidemics, epidemic control strategies and vaccination; dynamical systems theory and bifurcation analysis, scientific computing with MATLAB, ordinary differential equations, partial differential equations, integro-differential equations, stochastic and agent-based modeling, network and graph theory, parameter estimation and fitting models to data.

Projects will involve theoretical, computational, and data analysis components.

Cellular Phones: All cellular phones and other electronic devices must be switched off during all class times unless they are being used for class purposes.

ADDITIONAL RESOURCES

Math Tutoring Center: Located in the Central King Building, Lower Level, Rm. G11 (See: Spring 2021 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.

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

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 Chantonette Lyles, Associate Director of the Office of Accessibility Resources and Services at 973-596-5417 or via email at lyles@njit.edu. The office is located in Kupfrian Hall, Room 201. A Letter of Accommodation Eligibility from the Office of Accessibilty Resources and Services 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/studentsuccess/accessibility/

Important Dates (See: Spring 2021 Academic Calendar, Registrar)

Date	Day	Event
January 19, 2021	T	First Day of Classes
January 23, 2021	S	Saturday Classes Begin
January 25, 2021	M	Last Day to Add/Drop Classes
March 14 - March 21, 2021	Su - Su	Spring Recess - No Classes
April, 2, 2021	F	Good Friday - No Classes
April 5, 2021	M	Last Day to Witdraw
May 4, 2021	T	Friday Classes Meet
May 4, 2021	T	Last Day of Classes
May 5 & May 6, 2021	W & R	Reading Days
May 7 - May 13, 2021	F - R	Final Exam Period

Course Outline

Week #	Subject Topic
Week 1-2:	Introduction to infectious disease modeling
Week 3-5:	Applications to influenza, HIV, malaria, rabies, SARS, and other outbreaks
Week 6-7:	Preparation of Midterm projects
Week 8:	Midterm project reports due; Midterm project presentations
Week 9:	Spring break
Week 10-12:	Introduction to COVID-19 modeling
Week 13-15:	Preparation of Final projects
Week 16:	Final project reports due
Week 17:	Final project presentations