

THE DEPARTMENT OF MATHEMATICAL SCIENCES

MATH 450H: Methods of Applied Mathematics I (Capstone I)
Fall 2020 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: Combines mathematical modeling with physical and computational experiments conducted in the Undergraduate Mathematics Computing Laboratory. Effective From: Spring 2009.

Number of Credits: 3

Prerequisites: Math 331 with a grade of C or better, Math 337 with a grade of C or better, and Math 340 with a grade of C or better.

Course-Section and Instructors

Course-Section	Instructor
Math 450-H01	Professor W. Choi

Office Hours for All Math Instructors: [Fall 2020 Office Hours and Emails](#)

Course Materials:

NO BOOK REQUIRED

No book is required, but the recommended includes

- Mathematical methods in the physical sciences, M. Boas
- Introduction to computation and modeling for differential equations, L. Edsberg
- Spectral methods in Matlab, L. N. Tefethen
- Elementary fluid dynamics, D. J. Acheson
- Water waves mechanics for engineers and scientists, R. Dean & R. Dalrymple

University-wide Withdrawal Date: The last day to withdraw with a W is **Monday, November 9, 2020**. 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:

Participation	20%
Assignments	50%
Final Project Report/Presentation	30%

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.

Makeup Exam Policy: To properly report their absence during a midterm or final exam, please review the required steps under the DMS Examination Policy found here:

- http://math.njit.edu/students/policies_exam.php

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: [Fall 2020 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: Disability Support Services (DSS) 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 Disability Support Services at [973-596-5417](tel:973-596-5417) or via email at lyles@njit.edu. The office is located in Fenster Hall Room 260. For further information regarding self identification, the submission of medical documentation and additional support services provided please visit the Disability Support Services (DSS) website at:

- <https://www.njit.edu/studentssuccess/accessibility/>

Important Dates (See: [Fall 2020 Academic Calendar](#), [Registrar](#))

Date	Day	Event
September 1, 2020	T	First Day of Classes
September 5, 2020	S	Saturday Classes Begin
September 7, 2020	M	Labor Day

Septmeber 8, 2020	T	Monday Classes Meet
September 8, 2020	T	Last Day to Add/Drop Classes
November 9, 2020	M	Last Day to Withdraw
November 25, 2020	W	Thursday Classes Meet
November 26-29, 2020	R - Su	Thanksgiving Recess
December 10, 2020	R	Last Day of Classes
December 11 & 14 2020	F & M	Reading Days
December 15 - 21, 2020	T - M	Final Exam Period

Course Outline

Week	Topic
Week 1 - 2	Ordinary and partial differential equations
Week 3 - 4	Numerical method I: finite difference
Week 5 - 6	Numerical method II: spectral/pseudo-spectral
Week 7 - 8	Perturbation methods
Week 9 - 12	Fluid mechanics/Linear water waves
Week 13 - 14	Final projects
Week 15	Final project presentations

*Updated by Professor W. Choi - 8/30/2020
Department of Mathematical Sciences Course Syllabus, Fall 2020*