

# Syllabus

Year	2021	Semester	Fall	Course Code	MATH439	Class	01
Department	Mathematics					Credit	3
Title	Topics III:Mathematical Data Science						
Places	50 (Course places for VSE: 15)						
Schedule	Mon, Wed 14:00-15:15 (UTC+09) : Lecture & Tutorial						

Teacher	Prof. Jae-Hun Jung	Department	Mathematics
E-Mail	JUNG153@POSTECH.AC.KR	Homepage	
Language	English	Tel.	
Office Hours			

## Course Objectives

Data science is one of the most growing scientific disciplines today. This course will introduce various mathematics related to modern data science. The subjects that will be covered for the semester include Introduction to data science and big data, Preprocessing of data, Interpolating data, Classification of data, Generating scheme of data, Text, sound, and image data, Stochastic and chaotic characteristics of data, data-driven computing, Topological and geometrical understanding of data, Manifold representation of data, Artificial intelligence and data, Data analysis with Python and visualization, etc. Students will also implement the learned materials into Python programming.

## Specific Restrictions

It is recommended, but not required, to take linear algebra, differential equations, numerical analysis, and partial differential equations as prerequisites.

## Grading Criteria

Class attendance: 10%  
 Homework: 30%  
 Midterm exam: 30%  
 Final research project: 30%

## Textbook

Title	Writer	Publisher	Year	ISBN

## Reference

Introduction to Mathematical Data Science - by example (Instructor's lecture note), 2021.

## Course Schedule

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Places	50 (Reserved for APRU: 15)						
Schedule	Mon, Wed 14:00-15:15 (UTC+09) : Lecture & Tutorial						

The subjects covered are

- Introduction to data science and big data
- Preprocessing of data
- Interpolating data
- Classification of data
- Data generating schemes
- Text, sound, and image data
- Stochastic and chaotic data
- Data-driven computing
- Topological and geometrical understanding of data
- Manifold representation of data
- Artificial intelligence and data
- Data analysis with Python and visualization

## Mode of Teaching

The class is composed of lecture and tutorial sessions.

Each class will provide both the theoretical and practical (computational) aspects of data science with hands-on tutorials.

Weekly homework will be assigned. Students are required to attend the class regularly and submit their homework on time.

## etc consideration