

Information for MATH 3670/5670, Mathematical Data Science

Fall 2022

Time: T/Th 1:15 - 2:30pm

Location: Stevenson Center 1432

Instructor: Prof. Dylan Domel-White

Office: Stevenson Center 1525

Office Hours: W 1:00 - 2:00pm, Th 2:30 - 3:30pm, or by appointment

E-mail: dylan.domel-white@vanderbilt.edu

Catalog Description: Linear methods for regression and classification, bias-variance tradeoff, and basis expansions and regularization. Kernel methods, support vector machines, dimension reduction, and clustering algorithms. Prerequisite: one of MATH 2810, 2820, or 3641; and one of MATH 2410, 2501, or 2600.

Textbook: There is no required textbook for the course, but lectures will occasionally follow or refer to the following books (both freely available from their author's website):

- The Elements of Statistical Learning Theory by Hastie, Tibshirani, Friedman:
<https://web.stanford.edu/~hastie/ElemStatLearn/>
- Pattern Recognition and Machine Learning by Bishop:
<https://www.microsoft.com/en-us/research/publication/pattern-recognition-machine-learning/>

Exams: There will be three in-class exams on the following days:

Exam 1: September 29

Exam 2: October 27

Exam 3: December 1

Exam 4: 10/9

Quiz 1: 10-12

There will not be a final exam.

Homework: Homework will be regularly assigned and collected. Homework will contain both theoretical and numerical problems, and sometimes small programming problems. Prior programming experience is not assumed, and examples will be provided to help you get started on these problems. Graduate students enrolled in 5670 will additionally be required to read and present to the instructor a suitable research paper, counting as part of the homework grade.

Grades: Your final grade will be determined by the three exams and homework following the rubric:

Exams: 75%

Homework: 25%

Make-up Policy: If you miss an exam or need additional time on an assignment (with an acceptable and unavoidable reason), please contact the instructor as soon as possible.

Honor Code: All work submitted for credit is subject to the provisions of the Vanderbilt University Honor Code.

Adding/Dropping a Math Course: The last day for students to add a math course or to make other changes in YES is Tuesday, August 30th. Between August 31st and September 6th, any adjustments in level or in grading status must be completed using the Change of Course Request Form. If only the "DROP" section of the form is filled out, the instructor may "sign" the form. If a student wishes to make any change that involves filling in the "ADD" section of the form (whether or not it also involves filling in the "DROP" section), then the student must contact the DUS (Henry Chan). Per Math Department policy, the only change to a math course that will be approved is a change to the level of the course (e.g., switching from Math 1301 to Math 1300 or vice versa).

Disclaimer: The information contained in this syllabus is subject to change.