

**640:495 Special Topics ‘AI tools for mathematics’
Syllabus and course information**

Course Information

Instructor: Prof. Lisa Carbone

e-mail address: lisa.carbone@rutgers.edu

Office Hours: By appointment

Section: TTh5 3:50 – 5:10pm, TIL-103A Livingston

Course Description

This section will explore the intersection of artificial intelligence, formal mathematical reasoning and computation, with a focus on concepts from algebra, particularly linear algebra. Topics include using Large Language Models (LLMs) to generate formal proofs in systems like Lean, prompt engineering for mathematical tasks, verification of AI-generated code and debugging AI generated code and proofs.

Prerequisites

Background in proof-based mathematics, 640:300 Intro Math Reasoning is strongly recommended. Programming experience will be beneficial but is not essential.

Assessment

Assessment will be based on class participation, and two projects, a midterm project and an end of semester project, both to be delivered by class presentation. Relevant homework assignments will be given. These will not be graded, but will be counted for and relevant to participation in class.

Class Participation (20%):

Mid-Semester Project (30%):

End-of-Semester Project (50%):

Course materials:

There is no required text for this section. Course material will be drawn from various sources and lecture notes will be provided.

Technology requirements:

A laptop will be required for each class to be used for reading, implementing AI and programming.