

**MATH 494 (MAST 699/MAST 833), Sec. D**

Topics in Pure & Applied Mathematics/Algebra/

Number Theory: Elliptic Curves

*Fall 2024*

**Instructor:** Dr. C. David, Office: LB 927-9 (SGW), Phone: (514) 848-2424, Ext. 3227  
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**Class Schedule:** Wednesdays & Fridays, 16:15-17:30.  
Mid-term break: no class between October 15, 2024, and October 20, 2024.

**Office Hours:** TBA.

**Text:** The following texts are good references for the topics that I will cover, but it is not mandatory to buy them.

- *The Arithmetic & Elliptic Curves*, J. Silverman, GTM volume 136, Springer.
- *Algebraic Function Fields and Codes*, H. Stichtenoth, GTM volume 254, Springer.
- *Number Theory Function Field*, M. Rosen, GTM volume 210, Springer.

**Evaluation:** The evaluation will consist of either:  
1) Assignments for 100%  
2) Assignments for 60% and presentation for 40%.

If the grading scheme for this course includes graded assignments, a reasonable and representative subset of each assignment may be graded. Students will not be told in advance which subset of the assigned problems will be marked and should therefore attempt all assigned problems.

**Topics:** This course is a topic course on elliptic curves, which can be taken as a first or second course on the subject. We will first study elliptic curves (and general curves) over finite fields, proving the Weil conjectures for curves over finite fields, and making the link with random matrix theory. Other related possible topics: the Sato-Tate conjecture and the modularity of complex multiplication elliptic curves.

### **Academic Integrity and the Academic Code of Conduct**

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### **Behaviour**

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