



## **Math 849, A Proof of Fermat's Last Theorem**

**Number of Credits:** 3 credits

**Course URL:** <http://www.math.wisc.edu/~boston/849.html>

**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement

**Meeting Time and Location:** MWF 9:55-10:45 in Van Vleck B235

**Instructional Mode:** Face to face

**Credit hours:** The three credit hours are met by three 50-minute meetings and a minimum of two hours of out of class student work per week for 15 weeks.

### **INSTRUCTOR:**

Nigel Boston

**Office hours and location:** WF 11:00-12:00 and/or by appointment, Van Vleck Hall 303

**Email:** [boston@math.wisc.edu](mailto:boston@math.wisc.edu)

### **OFFICIAL COURSE DESCRIPTION**

This is an advanced topics course in algebra for graduate students.

#### **Requisites**

Graduate or professional standing.

### **LEARNING OUTCOMES**

At the end of this course students should be able to:

- understand the proof of Fermat's Last Theorem.
- have proficiency with many of the tools of modern arithmetic geometry, such as elliptic curves, modular forms, deformations of Galois representations, Galois cohomology, and profinite groups.
- know how to prepare a research monograph.
- research a related topic well enough to prepare a short paper and presentation.
- become more proficient in explaining mathematics to others and in engaging others to learn mathematics.

## **Textbook and Software**

- None
- Students will use LaTeX to write up course notes and final papers to be posted on the course webpage.

## **GRADING**

- Final Paper 40%
- Final Presentation 40%
- Write-up of 2 classes 20%

## **EXAMS**

There are no exams in this course.

## **HOMEWORK & OTHER ASSIGNMENTS**

- Final Paper: You are expected to write a 10 to 20 page paper on some topic related to the course material. There is a list of suggested topics on the course webpage or else you can propose something yourself. You should see me before spring break to discuss what exactly your paper will cover.
- Final Presentation: At the end of the semester we will schedule 15-minute slots for oral presentation of your project to the rest of the class. Again, you will be expected to meet with me beforehand to discuss what you will cover (slides are encouraged and we can look through these together). I shall give you feedback afterwards on both your paper and presentation.
- Write-up of Two Classes: The goal is to produce a lasting document, to be posted online, that will present the proof of Fermat's Last Theorem in a way accessible to graduate students who have completed the initial year-long graduate algebra sequence. It is expected that exercises will be included with the write-ups.

## **RULES, RIGHTS & RESPONSIBILITIES**

- See the Guide's to [Rules, Rights and Responsibilities](#).

### **ACADEMIC INTEGRITY**

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, refer to <https://conduct.students.wisc.edu/academic-integrity/>.

### **ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES**

**McBurney Disability Resource Center syllabus statement:** "The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [!], will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA." <http://mcburney.wisc.edu/facstaffother/faculty/syllabus.php>

### **DIVERSITY & INCLUSION**

**Institutional statement on diversity:** "Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals.

The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world." <https://diversity.wisc.edu/>