

MATH 599 Mathematics Teaching Techniques

Course Description: principles of Mathematics teaching and learning; focus is on both the pedagogical challenges and technical aspects of teaching Mathematics to undergraduate students (mostly first and second year students). This course is mandatory only for graduate students who wish to teach in the Mathematics Department.

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

- articulate their teaching philosophy
- gain some experience in teaching mathematical concepts to first-year students
- demonstrate competence in designing and delivering a standard one hour-long lecture in a real setting

Course structure: The class meets three times a week; classes are cancelled in week 8 to 10 and resume in week 11 to the end of term.

In week 1 to 7, classes are organized roughly as follows: discussion and group activities on Mondays, class observations/mini presentations on Wednesdays, mini presentations/guest speakers on Fridays.

In week 8 to 10, students prepare and deliver a guest lecture and attend their peer's lectures.

In week 11 to 13, class discussions are scheduled on Mondays and Wednesdays and guest speakers on Fridays.

There is no textbook for this course. Readings from various sources will be distributed.

Homework: There are assigned readings every week in the early part of the term; in addition, students are required to submit a teaching statement by the end of the term.

Assessment: The course is graded on a pass/fail basis. Passing the course is based on the following:

- attendance to at least 90% of class meetings,
- participation to in-class discussions and activities,
- completion of teaching presentations and teaching philosophy statement,
- delivery of a guest lecture.

There is no final exam in this course. Each student is required to deliver a guest lecture in a first year Calculus course some time in November. For students who wish to teach undergraduate courses in the Math department, performance in the guest lecture will provide the grounds for evaluation of their suitability to teach.

Discussion topics by week

1. Course Introduction
2. Classroom presence
3. Learning outcomes and students' prior knowledge
4. What drives students' motivation to learn
5. How learning works
6. Lecture structure
7. Classroom interaction
8. Guest lectures
9. Guest Lectures
10. Guest lectures
11. Role of feedback and homework
12. Problematic cases
13. The teaching statement