

MA 601 Schedule

1. Before August 26. Getting ready for the first day of class. Reading from *Teaching First*:
 1. Types of Teaching Assistantships
 2. Before You Teach: A Checklist
 3. Day One
 4. What Goes On in Recitation
 8. The Semester in Five Minutes
 24. Advice to International TAs
 25. Some Silly Stuff
 36. The Essence of Good Teaching
2. August 31.
 - (a) Introductions.
 - (b) Reflections and feedback on the first few days of teaching.
 - (c) Some general principles.
 - (d) Assignment for next time: Make an observation.
3. September 14. Various policies, regulations, and services.
 - (a) FERPA
 - (b) Early Alert
 - (c) The Study
 - (d) The Mathskeller
 - (e) Excused Absences
 - (f) Disability Resource Center
 - (g) Suggested Responses to Distressed or Distressing Behavior During Class: A Guide for Faculty
 - (h) Academic Integrity and Offences
 - (i) Academic Ombud

4. September 21. Technology, including

- (a) Desmos
- (b) GeoGebra
- (c) SketchUp
- (d) L^AT_EX
- (e) Homework systems (did not discuss)

5. September 28. Some over-arching thoughts on the context of teaching. See the blog <http://blogs.ams.org/matheducation/2014/10/01/the-place-of-mathematics-and-the-mathematics-of-place>, and the presentation <http://www.ms.uky.edu/~lee/jamesmadison/place.pdf>.

Preparatory reading: Read the blog “The Secret Question (Are We Actually Good at Math?)”, <http://blogs.ams.org/matheducation/2015/09/01/the-secret-question-are-we-actually-good-at-math/#sthash.9bYnTieR.tJyyPJs8.dpbs>.

Some points.

- (a) Recognize the potentially significant role of personal place, including context and informal education, in the development of students’ capacity.
- (b) Deliberately create opportunities in the classroom in which students grapple with mathematics and communicate with each other. Carefully listen and use what you learn to shape what is to come. Provide an environment in which mistakes are opportunities for learning and not censure.
- (c) One measure of the efficacy of instruction (or professional development) is to determine what persists (mathematical content and mathematical practices) within a student or participant one year later.
- (d) Learning can be promoted when the material is above the student’s current state, but not so far above to be unattainable even with scaffolding and assistance.

- (e) With the explicit knowledge and understanding of your students, foster a growth mindset rather than a fixed mindset in your class.
 - (f) On the one hand, many value mathematics precisely because it transcends place, even though it may be initially motivated by a particular context. But on the other hand, the value of place (including personal, social, geographic, and community place) offers a rich and meaningful setting in which to nurture the understanding of mathematics.
6. October 5. Raising the cognitive level of instruction.
- (a) Readings
 - 6. Lesson Planning: Survivalist Tactics
 - 13. The Active Classroom
 - 14. “What Was That Question Again?”
 - 15. Motivating Students
 - 16. How to Solve It
 - (b) Good Questions Project at Cornell: <http://www.math.cornell.edu/~GoodQuestions>.
 - (c) Cognitive levels: <http://www.ms.uky.edu/~lee/bardstownpep/CognitiveLevels.pdf>. Decline and maintenance of cognitive demand: <http://www.ms.uky.edu/~lee/bardstownpep/DeclineandMaintenance.pdf>.
 - (d) How to Solve It
 - i. How to Solve It.
 - ii. Wikipedia article: https://en.wikipedia.org/wiki/How_to_Solve_It.
 - iii. Mathematics and Plausible Reasoning.
 - iv. The “Moore Method”: https://en.wikipedia.org/wiki/Moore_method.
7. October 12. Continued discussion on high level instruction. Gave a brief demonstration of one of Polya’s problems—cutting up space with planes.
8. October 19. Read the following in preparation for discussion on the backgrounds of our students.

- Common Core State Standards for Mathematics—Content and Practice, http://www.corestandards.org/wp-content/uploads/Math_Standards.pdf. Read in particular the Standards for Mathematical Practice (pp. 6–8), High School Algebra and High School Functions (pp. 63–71). These standards are supposed to raise the level of high school students’ knowledge and practice of math.
- David Bressoud’s four blogs on “Calculus at Crisis” (the links are on the course website).

Sections from the book:

- 22. Problems of and with Students.
 - 23. Student Types.
 - 28. The Perry Model.
9. October 26.
 - (a) Helping students cope with midterm grades.
 - (b) Introduction to the preparation of a CV and teaching statement.
 10. November 2.
 - 9. Cooperative Learning
 - 21. Teaching Methodologies for Various Types of Classrooms
 - 27. Using Cognitive Models to Make Appropriate Problems
 11. November 9. Vist to Physical Sciences Library
 12. November 16–23.
 - (a) Preparing a CV.
 - (b) Creating a website.
 - (c) Depth of Knowledge and questioning.
 - (d) Student success guideliens.
 13. November 30.

- (a) Course evaluations. See also section 17 and Appendix A.
- (b) Students dealing with the end of semester.
- (c) Writing in math courses. See also section 29.

14. December 7.