

Math Camp Summer 2011 (Aug 31 – Sep 14)

Lecture : MTWTF 9:00 AM - 12:00 PM, Room: Corwin 127

Precept : MTWTF 2:00PM - 3:30 PM, Room: Corwin 127

Instructor:	In Song Kim and Peter Buisseret
Office:	Corwin 031
Office Hours:	In Song Kim (1PM ~ 2PM) Peter Buisseret (4PM ~ 5PM)
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Faculty advisers:	Kosuke Imai, Adam Meirowitz, Kristopher Ramsay

Course Description: The math camp will prepare students to take the POL502 (Mathematics for Political Science) class and other graduate level classes in F&Q field. The goal of the class will be to remind students of basic and intermediate mathematical concepts and increase both mathematical fluency and problem solving ability. We will also try to give some intuitions for how you will see some of these mathematical tools in your course work in political science. There are no prerequisites and students with more recent mathematical exposure should gain as much as those whose mathematics education ended longer ago.

Course Structure: The course will meet for 10 days with morning Lecture session (3 hours) and afternoon Precept session (1 and a 1/2 hours). There will be daily problem sets to be completed outside of class. In Song Kim is responsible for the morning lecture: the topics for each day's lecture can be found below. Peter Buisseret will lead the afternoon precept session in which detailed solutions/discussions regarding each problem set will be provided.

Course Textbook: Simon & Blume (**SB**), "Mathematics for Economists," Norton 1994

Course Outline:

- Day 1 Logic of Proof / Mathematical Notations (**SB** Appendix A1)
- Day 2 Functions (**SB** 2.1)
- Day 3 Systems of Equations / Vectors (**SB** Ch.6)
- Day 4 Linear Algebra: Elementary Row Operations (**SB** 7.1, 7.2, 7.3, 7.4)
- Day 5 Matrix Algebra: Inverse / Determinants (**SB** 8.1, 8.2, 9.1, 9.2)
- Day 6 **Midterm** / Differential Calculus I: Limits (**SB** 2.3, 2.4, 2.5)
- Day 7 Differential Calculus II: Second Derivative / Graphing (**SB** 3.1, 3.2, 3.3, 3.4)
- Day 8 Differential Calculus III: Further Differentiation Rules (**SB** Ch.4, Ch.5)
- Day 9 Integral Calculus I: Fundamental Theorem of Calculus (**SB** Appendix A4)
- Day 10 .. Integral Calculus II: Techniques of Integration/**Final Exam** (**Lecture Note**)

Course Website:

We are going to use In Song Kim's webpage: <https://www.princeton.edu/~insong/teaching.html>. Please ask any questions regarding lectures and problem sets using our course email list: math2011_princeton@googlegroups.com. Please do NOT send questions to instructors' personal email address unless you believe doing so is needed. That is, please do not hesitate to

ask questions publicly! We will ultimately learn a lot from others' questions posted on the mailing list. There will be daily precepts if you need more detailed explanations.

Course Requirements: There will be ten problem sets. Each problem set will be distributed at the end of each lecture, and will be due by 9:00AM at the start of the following lecture. There will be in-class midterm and final exams. The problem sets and exams will be graded and solution sets will be distributed. Students are encouraged to work together on problems, but it would be much better if you can spend a decent amount of time on them individually before getting together. At a minimum, you should write up your solutions alone after anytime is spent working on the problems in a group. Remember: Solving problems on your own is the only way to learn mathematics!

Other Remarks: We expect that you will take notes as you see fit. One of the more challenging parts of taking math classes is being able to write down the mathematical notation, etc., that you are less accustomed to doing while an instructor is going along. We also expect that you will ask questions, and answer questions we pose or questions of other students. Finally, it will help if you are reading material as we go along. We would highly recommend reading along with relevant chapters in Simon and Blume or other textbooks you might have.