Instructor: Natalia Lazzati  
Office: McClelland 401CC  
Email: nlazzati@email.arizona.edu  
Office hours: Half an hour after class, or by appointment  

**Time and location:** Monday-Saturday, 9:00 – 11:00 AM, and 4:00 – 5:00 PM, McClelland 401KK.  

**Teaching assistant:** Adriana Gama Velazquez (gamavela@email.arizona.edu)  

**Main textbook:**  

**Other textbooks:**  

**Description of the course:** This is an intensive course about the mathematics one should know when beginning a doctoral program in Economics. The course objective is simply that you achieve an understanding of the concepts we will cover in the textbook and the ability to apply them. It will be a very fast-moving, very intensive course—a sort of mathematical boot camp. You’ll have little time for other things during these three weeks, but the course will prepare you for the other classes during your first year.  

**Readings:** Reading assignments will come mainly from Simon and Blume (1994). I expect you to read Chapters 1 through 14 before the first class begins, except for Chapter 12, which will be covered in ECON 519 (Part II).  

**List of topics:**  

1. General Preliminaries  
   (a) Linear algebra  
   (b) Differential calculus  
   (c) The implicit function theorem  
   (d) Quadratic forms  
   (e) Convex sets and concave functions  

2. Nonlinear Programming and Parametric Optimization  
   (a) Unconstrained optimization  
   (b) Lagrange  
   (c) Kuhn-Tucker  
   (d) Parametric analysis: envelope theorem and comparative statics  

3. Quasiconcave Programming  
   (a) Quasiconcavity and pseudoconcavity  
   (b) Lagrange and Kuhn-Tucker revisited
4. Homogenous and Homothetic Functions

**Grading:** The overall course grade will be comprised of daily problem sets (50%), a final exam (40%) and class participation (10%).

(*) The de la Fuente book will be the textbook for Part II of ECON 519.