

**Basic Math**  
MA in Social Sciences UC3M  
September 1<sup>st</sup>- 3<sup>rd</sup>

**Instructor:** Daniel Ramirez Smith  
**Email:** [dnr126@psu.edu](mailto:dnr126@psu.edu)  
**Location:** TBD.

**Schedule:** September 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup>.  
**Class time:** 1<sup>st</sup> session: 12:00 - 14:00.  
2<sup>nd</sup> session: 15:00-18:00  
**Office hours:** by appointment

**Course Description:**

This course offers a refresher of knowledge in math that is conducive to a strong quantitative foundation. The first section of the course provides a revision of arithmetic, algebra, calculus, and matrix algebra that students have potentially seen in school or in their undergraduate degree but have largely forgotten. The second section of the course is aimed at providing a basic understanding of statistics. Both of these sections are geared towards preparing students with the necessary foundation required in future courses of the program. The assumption of this course is that the attending students have little to no knowledge in math or statistics. The materials and classes are prepared to be as accessible as possible considering the level of the students.

**Required texts:**

Rosser, Mike, and Piotr Lis. *Basic Mathematics for Economists*. 2<sup>nd</sup> Edition. London ; New York: Routledge, 2016. [Older editions are free online and are equally valid for our course]

Exploratory Data Analysis in Business and Economics: An Introduction Using SPSS, Stata, and Excel. New York: Springer, 2013. [Optional]

**Class materials:**

Most of our class materials stem from the required texts, however; I will try to provide my own written material when possible to complement the text explanations. I will send these materials via email on a daily basis.

## **ASSIGNMENTS:**

The first form of assessment will be an in-class exam that will take place during the first 2 hours of class. The exam will be open book, and you will need the use of a computer and excel. This exam will count for 60%. The remainder of the grade will stem from in-class activities. I will disclose these activities once we start the sessions. Additionally, I will give options to make up for the exam with extra work if need be.

### **Schedule of Readings and Classes**

The dates listed are the dates I expect you to have read the assigned material and completed the assignments. Assignments are due prior to the start of class.

#### **Day 1: September 1st**

Reading: chapters 2 and 3 of Rosse & Piotr (2016).

- Syllabus and Class Introduction
- Basic arithmetic and algebra review.
  - Basic operations, Polynomials, and Equations.
  - Functions.
- Calculus review I.
  - Differentiation I

#### **Last portion of the class:**

- Introduction to Stata.
  - The Stata interface.
  - Type of files (“.dta” “.do” “log-files”)
  - Setting directories.
  - Using and saving data.

#### **Day 2: September 2nd**

Reading [optional]: chapters 8 through 15 of Rosse & Piotr (2016).

- Calculus review II.
  - Differentiation II
  - Optimization
  - Integration.

#### **Last portion of the class:**

- Basic data management using Stata.
  - File creation, file import
  - Importing data from another software (e.g. Excel)
  - Data formats (numeric, string, and variants.)
  - Managing variables (e.g. drop, keep, etc.)
  - Logical operators: if, in, by
  - Create and modify variables
  - Exporting data and results in other formats

### **Day 3: September 3rd**

Reading: chapter 15 of Rosse & Piotr (2016).

- Matrix Algebra I
  - Vectors and matrices
  - Operations I
- Matrix Algebra II
  - Operations II
  - Determinants

#### **Last portion of the class:**

- Basic data management using Stata II.
  - Data structures: long and wide.
  - Merging and appending data.
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#### Email Policy

I will use your UC3M email address. If you have another one, either forward your UC3M email to it or remember to check it. I will use email to alert you of any important class updates.

#### Electronics in the Classroom

You are ENCOURAGED to use your cellphones or tablets in the classroom but only for class participation. Every day we will engage in quizzes and problems that you can help solve by using Kahoot. Kahoot is a free app that allows for swift question/response interaction between professor and students. Any other use of electronics is forbidden. Headphones will not be permitted. If I perceive improper use of electronics within the classroom, you will be asked to put it away. If it is a persistent problem, you will be asked to leave the classroom.

#### Academic Integrity

As UC3M students, you are expected to act with academic integrity. I define academic integrity as the pursuit of scholarly activity in an open, honest and responsible manner. All students should act with personal integrity, respect other students' dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts.

Dishonesty of any kind will not be tolerated in this course. Dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students. Students who are found to be dishonest will receive academic sanctions and will be reported.

### Ground Rules

- Attendance is required.
- Come to class on time. If you are late to class, please quietly take a seat.
- Silence your cell phone prior to the start of class.
- Come to class prepared; that is having read and reviewed the assigned readings prior to the start of class.
- Class Climate and Conduct: A good course welcomes diverse viewpoints but always be respectful in raising them.