

**PhD Math Camp**  
AUGUST 21-25, 2017  
M-F 9:00 AM - 5:00 PM  
Room: ICC 234

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**Instructors:** Paula Ganga, pdg23@georgetown.edu and Alexander Podkul, arp52@georgetown.edu

**Faculty:** Hans Noel hcn4@georgetown.edu

### **Purpose**

The purpose of this course is to refresh mathematical concepts that underlie the statistical techniques you will learn in future classes. It is an intense one-week course that will cover a range of topics that include calculus, linear algebra, and probability. Each day, there will be lectures, in-class exercises, and homework. The aim of this course is to refresh concepts that you have previously learned as well as introduce you to new concepts that will be important in future classes. This class is designed to help you succeed in future courses. Questions are encouraged. Math camp is geared toward first year PhD students in Government, but is open to more advanced students as well.

### **Course Website, Text Book, and Online Resources**

The course website is <https://blogs.commonsgorgetown.edu/government-math-camp/>. On the course website, you will find useful materials including lecture slides, homework, additional resources, and readings.

The text that we have chosen for this class is *A Mathematics Course for Political and Social Research* by Will H. Moore and David A. Siegel. It is available through Amazon for \$40 for the paperback version. The authors of the text have provided additional resources for this textbook here: <http://people.duke.edu/~das76/MooSieBook.html> The textbook is also available online for free through the Lauinger library website: <http://www.library.georgetown.edu/>.

### **Polices and Evaluation**

While attendance is not mandatory, it is highly encouraged.

### **Computing**

This class will not require any computer programming. It will be mostly analytic in nature. However, we will at times use  $R$  to show examples in class.  $R$  is free and can be downloaded from [www.r-project.org](http://www.r-project.org). If you would like to follow along with examples in  $R$ , you can download this

prior to class. While we will show some programming, it will not be the focus of this class.

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### **Daily Schedule**

9:00-9:30    Review any questions from previous day  
9:30-10:40    Lecture 1  
10:50-12:00    Lecture 2  
12:00-1:00    Break for Lunch  
1:00-2:15    In-class problem set  
2:30-4:00    Lecture 3  
4:00-5:00    Homework/Office Hours

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**August 21st – Notation, Functions, Limits, and Derivatives**

**August 22nd – Linear Algebra and Introduction to  $\mathbb{R}$**

**August 23rd – Linear Algebra Continued**

**August 24th – Introduction to Probability**

**August 25th – Calculus II and Optimization**