Math Bootcamp for Incoming PhD Students – 2022

Time and Location: 9:30am-12pm M-F // Zoom link registration through email

August 1st – August 12th

Contact Information

Instructor: Monica Moses

Email: mmm0110@mix.wvu.edu

Instructor: Zejun Jiang

Email: zj00003@mix.wvu.edu

Required Materials

Textbook: Chiang, A.C., and Wainwright, Fundamental Methods of Mathematical Economics, 4th Edition, McGraw-Hill

Supplemental Materials

Shared throughout week through email chain

Course Description

This course in mathematical economics boot camp. It will provide the most necessary toolbox for the economic theory and econometrics courses. We will cover matrix algebra, comparative static analysis, basic optimization, comparative static analysis, and more.

Learning Outcomes

1. Be able to perform basic algebra operations
2. Use the tools of matrix algebra in economic applications
3. Apply calculus tools to perform comparative static analysis
4. Apply mathematical tools to analyze economic problems

Participation and Grading

This math camp will be based on participation during classes, which will be the most important aspect of the next two weeks. Your participation and attendance will be noted and reported back to the department. As for grading, we will assign a problem set the first week of the math camp. These exercises will be graded mostly based off of effort and checked for accuracy. If you show up, actively participate, and turn in problem sets, you will have no problem with the math camp. Attendance is strongly encouraged.

Course Schedule

The math bootcamp will be face to face for a total of 8 days, beginning Monday, August 3rd and we will conclude on Wednesday, August 12th. The schedule of topics can be found below.

Day	Topics	Details
Mon. 8/1	Introduction to the Course (both/Monica)	Expectations of course Helpful resources Basic algebra rules Ch. 2: Economic Models o Number system, set theory, relations, functions Ch. 3 • : Equilibrium Analysis in Economics
Tues. 8/2	Derivatives and Integrals (Monica)	Ch. 6 Derivative concept, limits, continuity and differentiability of functions • Supplemental Chapter on derivatives and Integrals o ***notes provided by me

		Ch. 7 Derivative rules (ALL), partial differentiation, chain rule
Weds. 8/3	Comparative static analysis (Monica)	Chapter 8 • Differential. • Total differentials. • Rules of differentials. • Total derivatives. • Derivatives of implicit functions. • 6. Application to market model.
Thurs 8/4	Matrix/Linear Algebra (Monica)	Chapter 4 • Matrices and vectors. • Matrix operations. • Vector space. • Laws of matrix operation. • Special matrix: identity and null. • Transpose and inverse of a matrix. Chapter 5 • Conditions for non-singularity of a matrix. • Use determinant to test non-singularity. • Basic properties of determinant. • Find Inverse of a matrix. • Cramer's rule. • • -> eigenvalues / vectors
Fri. 8/5	Tying it all together = Finishing any last topics	Use remaining time for homework//office hours
Mon. 8/8		

Tues. 8/9		
Weds. 8/10		
Thurs. 8/11		
Friday 8/12	***Problem Set 2 Due Today***	

Problem Sets

You will have one problem set due at the end of math camp on the last day, Friday, 8/12, at the end of class.

Accessibility Services

If you are a student with a disability and anticipate needing any type of accommodations in order to participate in this class, please contact me and we will make appropriate arrangements with the Office of Accessibility Services. All course content will be ADA compliant.
Office of Accessibility Services: (304)-293-6700

Statement on Social Justice

West Virginia University is committed to social justice. I concur with that commitment and expect to foster a nurturing learning environment based upon open communication, mutual respect, and non-discrimination. Our university does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color or national origin. Any suggestion as to how to further such a positive and open environment in this class will be appreciated and given serious consideration.

Statement on Academic Dishonesty

The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, I will enforce rigorous standards of academic integrity in all aspects and assignments of this course. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under

academic dishonesty and possible ensuing sanctions, please see the Student Conduct Code
http://studentlife.wvu.edu/office_of_student_conduct/student_conduct_code.
Should you have any questions about possibly improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please see me before the assignment is due to discuss the matter.
West Virginia University expects every member of its academic community to share the historic and traditional commitment to honesty and integrity. Academic dishonesty is defined to include but is not limited to the following: plagiarism; cheating and dishonest practices in connection with examinations, papers and projects; forgery, misrepresentation and fraud. Such behavior will not be tolerated and will be handled according to university guidelines (please refer to the Student Handbook for details).
All course materials, including lectures, class notes, quizzes, exams, handouts, presentations, and other materials provided to students for this course are protected intellectual property. As such, the unauthorized purchase or sale of these materials may result in disciplinary sanctions under the Campus Student Code.