

GMU Economics Math Camp 2019

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Classroom: Planetary Hall 224

Date/time: August 17 (12:00 - 16:00),
August 19-22 (19:00 - 22:00)

Course Description

Brief review of mathematical concepts from linear algebra, calculus, set, logic and probability theory. Given time, also an extremely brief review of topics in optimization and differential equations.

Textbook

- Mathematics for Computer Science by Eric Lehman and Tom Leighton (2004)
It has good introduction to sets and proofs. It is a free textbook available online (CC BY-SA 3.0):
<https://courses.csail.mit.edu/6.042/spring17/mcs.pdf>
- Mathematical methods for economic theory by Martin J. Osborne (2016) at <https://mjo.osborne.economics.utoronto.ca/index.php/tutorial/index/1/toc/c>
Also free online. We will use it for differential equations and optimization.

I will post all additional things at <https://arthurdolgoplov.net/teaching/mathcamp>.

Preliminary Schedule

August 17 (12:00-16:00) **Communicating math**

- Set theory and notation;
- Proofs: types of proofs, logical formulas.

August 19 (19:00 - 22:00) **Algebra**

- Linear algebra, vector spaces, matrices, eigenvalues and eigenvectors, determinant.

August 20 (19:00 - 22:00) **Infinitesimals**

- Review of calculus, differentiation, integration.

August 21 (19:00 - 22:00) **Probability**

- Probability spaces, random variables, combinatorics, Bayes rule, random walks.

August 22 (19:00 - 22:00) **Methods**

- Optimization (constrained, unconstrained, convex, integer), lagrangians;
- First order differential equations.

If you would like, you can always send me an email about the topics you would like us to cover adolgopo@gmu.edu or post in this poll <https://poll.ly/#/LA5ab15n>.