

MATH 1000: Topics in Mathematics

Spring 2018

Core 8

Mathematics Domain

MW 12:55-2:25 pm Sullivan-Harrell 307

Instructor

Dr. Alex Rice

Office

Sullivan-Harrell 364

Hours: M 11:45-12:45, W 2:30-3:30, Th 1:30-3:00

E-mail

riceaj@millsaps.edu

Phone

601-974-1371

Required Text

How Not to Be Wrong: The Power of Mathematical Thinking, Jordan Ellenberg

General Course Description

This course considers varying topics in mathematics chosen by the instructor. The content may focus on a specific subject or may survey several topics in mathematics. Possible topics include mathematics and society, logic and problem-solving, and models in business and the social sciences. This course does not serve as a prerequisite for any other mathematics course. An ACT mathematics sub-score of 16 or permission of the department is required.

Specific Course Description for Spring 2018

In this particular course, we will be closely reading, analyzing, and expounding upon the entirety of *How Not to Be Wrong*, Jordan Ellenberg's celebrated bestseller on the power and utility of a wide variety of mathematical skills and thought processes in everyday life.

Course Prerequisites

As a student enrolling in this course you must have an ACT Math sub-score of at least 16 or an SAT Math sub-score of at least 390.

Course Grade

Daily in-class reading checks: 20%

Daily in-class individual/group activities: 30%

Weekly written homework assignments: 20%

Final project, paper portion: 20%

Final Project, presentation portion: 10%

Final Grade / Grading Scale

[92, 100] A	[88, 90) B+	[76, 78) C+	[64, 66) D+
[90, 92) A-	[80, 88) B	[68, 76) C	[60, 64) D
	[78, 80) B-	[66, 68) C-	[0, 60) F

Important Dates

January 15	Martin Luther King Day, no classes
January 18	Last day for schedule changes without a grade
March 12-16	Spring Break, no classes
March 21	Last day for dropping courses with grade of W

American Disabilities Act

If you have any needs or require accommodations related to a disability or learning difference, please contact Patrick Cooper to register with the Office of Disability Services. You can reach him via e-mail at coopeap@millsaps.edu or by calling extension 1228. Accommodations will not be granted until a meeting has taken place with Patrick, letters have been processed, and you have met with your instructor.

Compass Curriculum

As an integral part of the Compass General Education Curriculum, this course is designed to help you develop in several areas of mathematical ability. The particular abilities that we will work on developing as a part of this class are:

Course must require students to accurately interpret and explain information presented mathematically and graphically.

For just one (of many) examples: the second chapter of the book, entitled “straight locally, curved globally”, discusses the pitfalls of using linear modeling for nonlinear phenomena on a large scale. These issues are treated with concrete arithmetic, symbolic manipulation, and graphs.

Course must require students to quantify problems, apply abstract symbolic manipulation or reasoning, and interpret results.

As we will with all concepts introduced in the book, we will expand upon the ideas and examples presented in the aforementioned chapter “Straight Locally, Curved Globally,” by working problems, both in class and at home, both individually and in groups, that will require concrete arithmetic, symbolic manipulation, and drawing and interpreting graphs.

Course must teach students to understand how the computational skills taught apply in contexts both within and outside mathematics.

The central theme of the entirety of Ellenberg’s book is to impart to the reader that the presented skill set, both computational and logical, both concrete and abstract, is powerful and valuable in contexts both within and outside the specific academic discipline of mathematics.

Course must teach students to explicitly describe assumptions in estimation, modeling or data analysis, and make appropriate inferences with critical thinking.

For just one (of many) examples: the opening chapter of the book relays the story of “Abraham Wald and the missing bullet holes”, which is ultimately a discussion of the statistical phenomenon of survivorship bias, as an introductory example of how different assumptions can lead to different conclusions when analyzing data, and how critical thinking can lead one to determine which of those assumptions best models reality.

Course must teach students to develop and interpret mathematical models of raw data, or physical or social phenomena.

In the aforementioned anecdote about Abraham Wald, the reader is presented with raw data concerning the average number of bullet holes found in each section of WWII aircraft, followed by two models and interpretations, one of which is ultimately seen to make more sense and be preferable. We will expand on these ideas with more examples, both in and out of the classroom.

Course must include regular, authentic writing assignments as appropriate to discipline/material, with an emphasis on writing to learn approaches.

In addition to the final paper, which must include both significant prose and mathematical content, the daily in-class and weekly homework assignments will often be writing-intensive.

Honor Code

Millsaps College is an academic community dedicated to the pursuit of scholarly inquiry and intellectual growth. The foundation of this community is a spirit of personal honesty and mutual trust. Through their Honor Code, the students of Millsaps College affirm their adherence to these basic ethical principles.

An Honor Code is not simply a set of rules and procedures governing students' academic conduct. It is an opportunity to put personal responsibility and integrity into action. When students agree to abide by an Honor Code, they liberate themselves to pursue their academic goals in an atmosphere of mutual confidence and respect.

The success of the Code depends on the support of each member of the community. Students and faculty alike commit themselves in their work to the principles of academic honesty. When they become aware of infractions, both students and faculty are obligated to report them to the Honor Council, which is responsible for enforcement. A representative, but not exhaustive, list of academic offenses and violations covered by the Millsaps Academic Honor Code is provided at http://www.millsaps.edu/academics/honor_code.php.

The pledge signed by all students upon entering the College is as follows:

As a Millsaps College student, I hereby affirm that I understand the Honor Code and am aware of its implications and of my responsibility to the Code. In the interests of expanding the atmosphere of respect and trust in the College, I promise to uphold the Honor Code and I will not tolerate dishonest behavior in myself or in others.

Each examination, quiz, or other assignment that is to be graded will carry the written pledge: **“I hereby certify that I have neither given nor received unauthorized aid on this assignment. (Signature)”** The abbreviation **“Pledged”** followed by the student's signature has the same meaning and may be acceptable on assignments other than final examinations.

It is the responsibility of students and faculty to report offenses to the Honor Code Council in the form of a written report. This account must be signed, the accusation explained in as much detail as possible and submitted to the Dean of the College.

The Honor Council, 2017–2018

Students:

Patrick Davis, Chair
DJ Hawkins, Vice Chair
Lillian-Lee Broussard
Emma Carter

Faculty:

Dr. Lynn Raley (Fall) / Dr. David Wood (Spring) - Faculty Advisor
Dr. Blakely Fender
Dr. Nathan Shrader

Policies of the Instructor

- In the event of an absence due to a college-related obligation or a documented medical emergency, a student will have one week to complete that day's reading check and discuss that day's class activities in the instructor's office. An absence for any other reason will result in a 0 for that day's reading check and activities.
- One reading check, one class activity, and one homework assignment will be dropped when computing grades.
- There is no "extra credit" of any kind in this course.
- Any *violation of the Millsaps Honor Code* will be reported to the Honor Council. This includes (but is not limited to): cheating, plagiarism, lying, submitting someone else's work as your own, submitting work which you do not understand (in the case of group projects), and unauthorized assistance on any assignment which will be graded. See http://www.millsaps.edu/academics/honor_code.php
- *Cell phones and similar devices* are to be silent and put away during class. *Laptops* are to be closed.
- *Class communications* will be made by Millsaps e-mail. It is your responsibility to check your account.
- *Content of this syllabus* is subject to change by the instructor.