

Make calculus and statistics a part of the Core

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By [Robert Tang](#) | March 8, 2018, 2:23 AM

You would probably feel ashamed to admit a deep contempt for literature or an inability to understand moderately complex prose. But people will readily admit that they don't understand basic mathematical concepts, and chances are if you don't like math, you're not shy about it.

You can get away with this at Columbia, too—there's no math in the Core Curriculum, the thing that is supposed to turn us into the well-rounded students and leaders of tomorrow, the perfect specimens that fill their admissions brochures. At Columbia College, [math isn't mentioned](#) as part of the Core, and at GS, the requirement can be fulfilled by an [econ course or a score of 600 on the math SAT](#). But you're required to take 17 credits of literature, writing, art, and music, eight credits of Western philosophy and social theory, 16 credits of foreign language, and six credits of odds and ends from around the world. The humanities Core adds up to more than three semesters worth of coursework—and up to 47 of the 124 credits required for graduation.

You do have to take [10 credits of science](#), but it's peripheral—both in subject matter and importance to the Core overall. While math courses are allowed to count towards the science requirement (but only one of the two classes), it's entirely possible to avoid them, and to avoid foundational courses in chemistry, biology, and physics by enrolling in classes like Weapons of Mass Destruction or Food and the Body. There's no minimum preparation in mathematics that's required for admission, and in fact, it's possible to graduate from Columbia without having taken a single course in math or statistics.

I think that in order to graduate from Columbia, everyone should be required to take one semester of single-variable calculus and one semester of statistics. These two courses are probably more important to general intellectual development than any other courses offered at Columbia, for the reason that they are foundational in a way that nothing else is.

In the same way that mastering grammar, prose, and style enables a budding author to eventually write novels, calculus and statistics “unlock” all the disciplines that use their fundamental techniques. Scholarship builds on itself in all fields, but lacking calculus and statistics is uniquely devastating because they are fundamental to so much of modern scholarship.

For a student who doesn't understand calculus, entire fields of academic inquiry become completely inaccessible. Without understanding derivatives and integrals, there would be no way to understand physics, astronomy, or (modern) economics. Very little of biology, chemistry, or engineering would make sense, since calculus is the basis of how we understand changes over time. And it goes without saying that the past 400 years of mathematics—everything since Newton and Leibniz—goes out the window, too.

A lack of statistical knowledge eliminates most of the remaining social sciences and natural sciences, because anything that involves the collection and interpretation of quantitative data becomes inaccessible. Granted, anyone with a middle school education can understand that on average, women earn approximately [20%](#) less than men, but the story doesn't end there—statistical techniques let us tease out insights that aren't apparent on the surface. For example, when you control for the fact that men and women choose different professions at different rates, the number changes. When you break the data down further, you find that earnings trajectories look different for men and women. And interestingly, you find data that suggests that [motherhood uniquely diminishes women's career prospects, and that the gender wage gap might just be a disguised childbearing penalty](#). *Without statistical literacy, we become prone to making naive judgments from limited evidence, and it becomes impossible to engage critically with facts, theories, predictions, and conclusions.* That leaves a very narrow set of subjects which remain accessible, mostly within the humanities. And even then, mathematical and statistical techniques find application in the humanities—there is math in music theory, statistics in historical research, and symbolic logic in philosophy.

I've always believed that the Core ought to be foundational—that is, it should deal with the ideas that form the basis of Western thought, culture, and academic inquiry. Literature Humanities and Contemporary Civilization examine the foundational texts of the Western tradition, and calculus and statistics are the basic tools of the social sciences and natural sciences. It's true that you won't necessarily need math in your career or future academic plans, but that's the whole point of the Core: It forces us to take courses that are valuable, no matter whether we think they're useful or not. We are probably not going to directly benefit from reading *King Lear* or *Leviathan*, but these books, like the Core as a whole, are supposed to contribute to our personhood, and to our ability to think about *anything*, not just about concepts in our fields of academic or professional specialization.

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