



Cornell University

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Subject: Memorandum:  
[Chemistry Major Mathematics Course Requirements](#)  
Date: April 14, 2015  
From: Director of Undergraduate Studies  
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## Executive Summary

The purpose of this memo is to announce a clearer and more flexible mathematics course requirement for the Honors curriculum:

We are easing the multivariable calculus requirement for the Honors chemistry major to allow you to satisfy the major's advanced math requirement with *either* a multivariable calculus *or* a linear algebra course.

## The Core Math Requirement

The core math requirement is clear and remains unchanged. We require

- Math 1110 (Calculus I) *and*
- Math 1120 (Calculus II)

You may substitute AP credit for one or both courses. Alternatively, you can fulfill the core mathematics requirement with 4 AP credits and Math 1910 (Calculus for Engineers).

## The Present Upper Level Math Requirement

The upper-level math requirement is presently ambiguous. Chemistry 3890, which is strongly recommended for all chemistry majors and is required in the Honors Curriculum, has an upper-level mathematics course as a prerequisite. The chemistry major requires you to take upper-level elective courses; a number of possible upper-level mathematics electives are listed on the department website [[link](#)]. At least one of these electives is required to satisfy the Chemistry 3890 prerequisites. But which elective is required for Chemistry 3890? At present we give contradictory advice.

The Honors Curriculum website [[link](#)] currently states that Chemistry 3890 – 3900 has a prerequisite of one semester of multivariable calculus

- Math 1920 (Multivariable Calculus for Engineers), *or*
- Math 2130 (Calculus III), *or*
- Math 2220 (Multivariable Calculus).

The website concludes that “This math course is therefore required for the honors curriculum.” In agreement with this statement, the Chemistry Major Requirements Spreadsheet [[link](#)] indicates that Honors chemistry majors are required to take one of these courses. On the other hand, the Cornell Courses of Study website lists the prerequisites for Chem 3890 as

- Math 2130 (Calculus III) *or*  
Math 2310 (Linear Algebra with Applications) *or*  
Math 2220 (Multivariable Calculus);
- Phys 2208 (Fundamentals of Physics II, including electricity and magnetism); and
- Chem 2080 or permission of the instructor.

You will note that this list is different from the list given on the Honors Curriculum website [[link](#)] – the Courses of Study website states that you can satisfy the Chem 3890 prerequisite by taking linear algebra instead of multivariable calculus.

Why then does the Honors Curriculum require you to take multivariable calculus?

Some time ago the Chem 3890 instructor changed the course catalog to allow linear algebra *or* multivariable calculus to fulfill the prerequisite for Chem 3890. Since then, the course’s instructors have observed that multivariable calculus is much better preparation for Chem 3890 than is linear algebra. For this reason, if a student took only one advanced math class, we felt that multivariable calculus is much preferred over linear algebra. If you are interested in continuing in physical chemistry, then you should consider taking both a multivariable calculus course and a linear algebra course. If you only have room for only one upper-level mathematics class and are not continuing in physical chemistry, then we realize choosing linear algebra may just make more sense.

### **The Revised Upper Level Math Requirement**

We are therefore easing the multivariable calculus requirement for the Honors Curriculum to allow you to satisfy the major’s advanced math requirement with *either* a multivariable calculus *or* a linear algebra course. This is consistent with what the Cornell Courses of Study website lists as the prerequisites for Chemistry 3890.