

To Whom It May Concern:

January 11, 2024

We are writing to explain some exciting changes at Emory related to the adoption of a new chemistry curriculum, *Chemistry Unbound*. *Chemistry Unbound* organizes core chemical ideas and practices so that they are integrated, emphasized, and reinforced over the entire four-year undergraduate experience. The development of this curriculum was funded by a grant from the Howard Hughes Medical Institute in 2015 and students have been taking classes under this new curriculum in Fall 2017.

As a result of this change, you will not see classes called "General Chemistry" or "Organic Chemistry" on an Emory student's transcript. Please rest assured that students still have been exposed to the material and learning objectives traditionally found in these courses. In *Chemistry Unbound*, material from the traditional chemistry curriculum is presented in multiple courses in an order that makes use of the natural connections between different areas of chemistry and more closely mirrors the way scientists think about their science. The table on the next page gives examples of where topics are covered. While this list is not exhaustive, it is intended to give you a view of where key competencies are acquired.

One of the overriding principles of *Chemistry Unbound* is to prepare students to pursue their professional goals beyond Emory. For students wanting to go on to medical school, this has involved, among other efforts, mapping the new curriculum to the topics required for competency as defined by the AAMC, with particular attention to foundational concepts 4 and 5. In this mapping, we found that our four-semester foundational sequence covers *more* topics than a traditional sequence of two semesters of general chemistry followed by two semesters of organic chemistry. In recognition of this breadth and depth of training, the admissions team in the Emory School of Medicine have endorsed our new chemistry curriculum.

In addition, the material from our traditional biochemistry course is now spread between two classes, "Macromolecules," which is the fourth course in our core sequence, and "Biochemistry," which is an elective course offered by the department. These two classes together go into more depth than a traditional one semester biochemistry course.

More information on *Chemistry Unbound* can be found in the recently published article: McGill, et al., *J. Chem. Educ.*, **2019**, 96 (1), pp 35–46. Please do not hesitate to contact us if you have questions about the specific preparation of an Emory applicant for your program.

Sincerely,

R Buan Open

Brian Dyer Chair, Department of Chemistry briandyer@emory.edu

James Kimth

James Kindt Director of Undergraduate Studies, Chemistry jkindt@emory.edu



Course	Topics Covered	Related AAMC Concepts
Chem 150: Structure and Properties	Atomic structure; Electron configurations; Periodic properties; Chemical bonding; Molecular shape; Isomers; Symmetry; Stereochemistry; Intermolecular forces	Concept 4, Categories D, E Concept 5, Categories A, B
Chem 202: Principles of Reactivity	Entropy and enthalpy; Kinetic molecular theory; Chemical equilibrium; Acids and bases; Kinetics; Reaction mechanisms	Concept 4, Category A Concept 5, Categories A, B, E
Chem 203: Advanced Reactivity	Atomic and molecular orbital theory; Sigma and pi bonding; Lewis acid-base theory; Delocalization, Conjugation, and Aromaticity; Stereochemical principles of conformation and configuration; Racemization; Stereo- and regio- selectivity; Kinetic and Thermodynamic control	Concept 4, Category E Concept 5, Categories A, E
Chem 204: Macromolecules	Natural and synthetic polymers; Polymer morphology; Polymerization mechanisms; Replication, transcription, translation; Biological Polymers; Thermodynamics in biochemistry; Amino acids; Carbohydrates; Primary, secondary, tertiary, and quaternary protein structure; Protein folding; Enzyme catalysis and inhibition	Concept 1, Categories A, E Concept 5, Categories B, D, E
Chem 205: Light and Matter	Wave and particle descriptions of light; Chemical bonding and molecular orbital diagrams; Rotational and vibrational spectroscopy; Symmetry; Point groups and character tables; Blackbody radiation; Fluorescence and phosphorescence; X-ray spectroscopies; Lasers; Electronic band structure of solids	Concept 4, Categories D, E