

Graduate Certificate in Chemical Biology

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Through scientific progress our understanding of cellular systems has grown leading to a more nuanced appreciation of both these systems and associated disease processes. This knowledge has led to the formulation of a myriad new questions regarding the interactions of macromolecules within cells and the regulation of these interactions. The Certificate Program in Chemical Biology (<http://chembio.ku.edu/>) focuses on developing molecular tools necessary to probe these systems and explore new questions. In order to employ these tools, students require wide access to technologies, databases, scientific training environments and resources that facilitate learning at the interface of biology and chemistry. Multidisciplinary curricula that unite students around common goals empower students to acquire a working knowledge of disciplines outside their area of expertise. The resulting interdisciplinary experience paves the road to collaborative science driving broad advances in understanding human health. The program has participation of students and mentors from the College of Liberal Arts and Sciences (<http://clas.ku.edu/>) (primarily Chemistry (<http://chem.ku.edu/>) and Molecular Biosciences (<http://molecularbiosciences.ku.edu/>)), the School of Pharmacy (<http://pharmacy.ku.edu/>) (principally in Medicinal Chemistry (<http://medchem.ku.edu/>) and Pharmaceutical Chemistry (<http://pharmchem.ku.edu/>)) and the School of Engineering (<https://engr.ku.edu/>) (Bioengineering (<https://bioengr.ku.edu/>)).

About the Program

At the heart of the Certificate Program in Chemical Biology is an integrated academic curriculum that provides participating students with a working knowledge of the key concepts and methods of the interdisciplinary field of Chemical Biology. Students with strong chemical or biological backgrounds will reap the benefits of collaborative exposure to modern techniques and theories in disciplines across the chemical biology interface. Students are required to:

- Follow a defined course sequence designed to provide a working knowledge across the chemical biology interface. The curriculum includes a flagship course defining the principles and practice of chemical biology. A fundamental part of the curriculum is the seminar course entitled "Careers in the Biomedical Sciences," which highlights opportunities for doctoral graduates inside and outside academia and industry. The training also emphasizes the completion of rigorous, reproducible, transparent and ethical research.
- Organize and participate in the annual Biomedical Sciences Symposium. This symposium includes oral presentations by the students on their research and a lecture by an internationally recognized keynote speaker in a research area at the chemistry/biology interface. The students also lead an afternoon interdisciplinary poster session that is open to all students.

Admission to Graduate Studies

Admission Requirements

- All applicants must meet the requirements outlined in the Admission to Graduate Study (<https://policy.ku.edu/graduate-studies/admission-to-graduate-study/>) policy.

- Bachelor's degree: A copy of official transcripts showing proof of a bachelor's degree (and any post-bachelor's coursework or degrees) from a regionally accredited institution, or a foreign university with equivalent bachelor's degree requirements is required.
- English proficiency: Proof of English proficiency (<https://gradapply.ku.edu/english-requirements/>) for non-native or non-native-like English speakers is required. There are two bands of English proficiency, including Admission and Full proficiency. For applicants to online programs, Full proficiency is required.

The Certificate Program is open to all graduate students at KU.

The training platform will provide students with an integrated educational training program that hones their skills and provides a broad wealth of information for career development. This program extends beyond the standard knowledge and capabilities developed in the independent departmental doctoral programs. Candidates in this program develop a working knowledge of both advanced chemistry and advanced biochemistry/biology, which supplements the more specialized environment within the laboratory of their research mentor. Underrepresented minority students and students with disabilities are encouraged to apply. Any necessary accommodations for students with disabilities are made with the assistance of the office of Student Access Services (<http://access.ku.edu/>).

Please see the Admission to Graduate Study (<http://policy.ku.edu/graduate-studies/admission-to-graduate-study/>) policy for information on admission requirements. Applications may be submitted to the office of Graduate Admissions (<https://gradapply.ku.edu/apply/>).

Certificate Requirements

Course requirements: Students must complete 5 courses for a total of 14-17 graduate credit hours.

Code	Title	Hours
One introductory course:		3-6
BIOL 807	Graduate Molecular Biosciences	
CHEM 720	Fundamentals and Methods of Analytical Chemistry	
CHEM 760	Introduction to Chemistry in Biology	
MDCM 710	Chemistry of Drug Action I	
PHCH 862	Physical Chemistry of Solutions, Solids and Surfaces	
One Topics Survey Course		3
BIOL/CHEM/ MDCM/PHCH 860	Principles and Practice of Chemical Biology	
1 hour, seminar; taken 2 semesters:		2
BIOL/CHEM/ PHCH 816	Careers in the Biomedical Sciences	
One elective in chemical biology:		3
Course must be outside the student's home department and support dissertation research or career development. The elective course should be approved by the program directors.		
Ethics and Safety Training:		3
BIOL/CHEM/ MDCM/PHCH 817	Rigor, Reproducibility and Responsible Conduct in Research	
Total Hours		14-17

At the completion of this program, students will be able to:

- Understand fundamental principles in biology and chemistry at a graduate level.
- Understand the role of scientists in the responsible conduct of research.
- Develop an individual career plan and assessment of possible career paths.