

Bachelor of Science in Molecular Biosciences

Molecular Biosciences

A bachelor's degree in molecular biosciences offers students a strong background in genetics, microbiology, cell biology and biochemistry, as well as hands-on lab experience. Many students in this program continue on to pursue medical, dental or pharmacy school, or graduate work in the health sciences with high success rates.

The KU Edwards Molecular Biosciences program is designed for undergraduate students who have already earned an associate's degree or equivalent hours and are looking to complete the last two years necessary for a bachelor's degree.

Undergraduate Admission

Admission to KU

All students applying for admission must send high school and college transcripts to the Office of Admissions. Unless they are college transfer students with at least 24 hours of credit, prospective students must send ACT or SAT scores to the Office of Admissions. Prospective first-year students should be aware that KU has qualified admission requirements that all new first-year students must meet to be admitted. Consult the Office of Admissions (<http://admissions.ku.edu>) for application deadlines and specific admission requirements.

Visit the Office of International Student and Scholar Services (<http://www.iss.ku.edu>) for information about international admissions.

Students considering transferring to KU may see how their college-level course work will transfer on the Office of Admissions (<http://credittransfer.ku.edu>) website.

Admission to the College of Liberal Arts and Sciences

Admission to the College is a different process from admission to a major field. Some CLAS departments have admission requirements. See individual department/program sections for departmental admission requirements.

First- and Second-Year Preparation

Because biology study requires preparation in other sciences, students should begin meeting major requirements in the first year. It is particularly important to take CHEM 130 and CHEM 135 in the first year and, for several majors, to take CHEM 330, CHEM 331, CHEM 335, and CHEM 336 in the second year. Ideally, most majors should also take BIOL 150 and BIOL 152 during the first year, as well as BIOL 105. Students who have taken BIOL 100 and BIOL 102, have earned an A or B in both courses, and have decided to major in a biological science should consult a UBP advisor to request permission to substitute BIOL 100 and BIOL 102 for BIOL 150.

Molecular Biosciences

KU Edwards Campus

The undergraduate program in molecular biosciences is offered in its entirety only at the KU Edwards Campus (<http://edwardscampus.ku.edu>),

12600 Quivira Rd., Overland Park, KS 66213. This program is designed for students who have earned an associate's degree or equivalent hours and wish to complete the upper-level courses necessary for a bachelor's degree.

Requirements for the B.S. Degree in Molecular Biosciences

The program offers students a strong background in genetics, microbiology, cell biology, and biochemistry, as well as laboratory skills in genetics and microbiology. Graduates have entered medical school, dental school, and graduate school with high success rates. Contact the CLAS undergraduate advisor on the Edwards Campus, Sandra Leppin, sandra.leppin@ku.edu, 913-897-8511, for more information.

General Education Requirements

In addition to degree and major requirements for all plans and subplans, all students must complete the KU Core.

General Science Requirements (33-37)

Majors must complete the following general science requirements that serve as foundational courses for this major.

Chemistry I. Satisfied by one of the following:	5	
CHEM 130	General Chemistry I	
CHEM 190 & CHEM 191	Foundations of Chemistry I, Honors and Foundations of Chemistry I Laboratory, Honors	
Chemistry II. Satisfied by one of the following:	5	
CHEM 135	General Chemistry II	
CHEM 195 & CHEM 196	Foundations of Chemistry II, Honors and Foundations of Chemistry II Laboratory, Honors	
Organic Chemistry I. Satisfied by one of the following:	3	
CHEM 330	Organic Chemistry I	
CHEM 380	Organic Chemistry I, Honors	
Organic Chemistry I Laboratory. Satisfied by:		
CHEM 331	Organic Chemistry I Laboratory	2
Organic Chemistry II. Satisfied by one of the following:	3	
CHEM 335	Organic Chemistry II	
CHEM 385	Organic Chemistry II, Honors	
Calculus. Satisfied by one of the following:	4-6	
MATH 115 & MATH 116	Calculus I and Calculus II	
MATH 125	Calculus I (Calculus I)	
Physics. Satisfied by one of the following:	8-9	
Option 1: College Physics		
PHSX 114 & PHSX 115	College Physics I and College Physics II	
Option 2: General Physics		
PHSX 211 & PHSX 216	General Physics I and General Physics I Laboratory	
PHSX 212 & PHSX 236	General Physics II and General Physics II Laboratory	
Statistics. Satisfied by one of the following:	3-4	
BIOL 570	Introduction to Biostatistics	
MATH 365	Elementary Statistics	

PSYC 210 Statistics in Psychological Research

Molecular Biosciences Course Requirements (31-32)

Molecular & Cellular Biology. Satisfied by:

BIOL 150	Principles of Molecular and Cellular Biology	4
or BIOL 151	Principles of Molecular and Cellular Biology, Honors	

Principles of Organismal Biology. Satisfied by:

BIOL 152	Principles of Organismal Biology	4
or BIOL 153	Principles of Organismal Biology, Honors	

Principles of Genetics. Satisfied by:

BIOL 350	Principles of Genetics	4
or BIOL 360	Principles of Genetics, Honors	

Fundamentals of Microbiology. Satisfied by:

BIOL 400	Fundamentals of Microbiology	3-4
or BIOL 401	Fundamentals of Microbiology, Honors	

Fundamentals of Microbiology Laboratory. Satisfied by:

BIOL 402	Fundamentals of Microbiology Laboratory	2
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Laboratory in Genetics. Satisfied by:

BIOL 405	Laboratory in Genetics	3
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Cell Structure & Function. Satisfied by:

BIOL 416	Cell Structure and Function	3
or BIOL 536	Cell Structure and Function (Honors)	

Molecular Biology Laboratory. Satisfied by:

BIOL 430	Laboratory in Molecular Biology	3
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Introductory Biochemistry. Satisfied by:

BIOL 600	Introductory Biochemistry, Lectures	3
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Principles of Biochemistry Laboratory. Satisfied by:

BIOL 601	Principles of Biochemistry Laboratory	2
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Senior Seminar in Molecular Biosciences (1)

Satisfied by:

BIOL 599	Senior Seminar: _____ (Must be taken in senior year. Offered only at the Edwards Campus.)	1
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Molecular Bioscience Required Electives (12)

Satisfied by completing 12 hours of BIOL courses numbered 400 or higher or BTEC 300, 310, 400, 475, 494, or 550, including at least 2 hours of a seminar/topics course (BIOL 419, BIOL 420, BIOL 421, BIOL 701). No more than 3 hours of BIOL 423 Non-Lab Independent Study and/or BIOL 424 Independent Study (combined) can be applied towards the elective requirement.

Seminar. Satisfied by completing at least 2 hours of the following seminar or topics courses:

BIOL 419	Topics in: _____	
BIOL 421	Topics in Molecular Biosciences: _____	
BIOL 420	Seminar: _____	
BIOL 701	Topics in: _____	

Major Hours & Major GPA

While completing all required courses, majors must also meet each of the following hour and grade-point average minimum standards:

Major Hours

Satisfied by 43-44 hours of major courses.

Major Hours in Residence

Satisfied by a minimum of 15 hours of KU resident credit in the major.

Major Junior/Senior Hours

Satisfied by a minimum of 12 hours from junior/senior courses (300+) in the major.

Major Junior/Senior Graduation GPA

Satisfied by a minimum of a 2.0 KU GPA in junior/senior courses (300+) in the major. GPA calculations include all junior/senior courses in the field of study including F's and repeated courses. See the Semester/Cumulative GPA Calculator (<http://clas.ku.edu/undergrad/tools/gpa>).

Below is a sample 4-year plan for students pursuing the B.S. in Molecular Biosciences. To view the list of courses approved to fulfill KU Core Goals, please visit the KU Core website (<http://kucore.ku.edu/courses>).

This degree plan assumes students will have the equivalent of MATH 101 or MATH 104, or equivalent prior to the freshman year, fall semester.

The Molecular Biosciences major is only available at the Edwards campus in Overland Park, KS. The Edwards Campus only offers Junior/Senior level courses (300+). Lower level courses (100-299) may need to be taken at the KU Lawrence campus or transferred in from another institution. Please consult an academic advisor for more assistance.

Freshman

Fall	Hours Spring	Hours
Goal 2.1 Written Communication (First Course, 2 Crs Required)	3 Goal 2.1 Written Communication (Second Course, 2 Crs Required)	3
CHEM 130 (Goal 1.2 Quantitative Literacy, General Science Requirement) ¹	5 MATH 115 (Goal 1.2 Quantitative Reasoning, General Science Requirement) ¹	3
BIOL 150 (Goal 3 Natural Science, Major Requirement) ²	4 BIOL 152 (Goal 3 Natural Science, Major Requirement)	4
Goal 2.2 Communication	3 CHEM 135 (General Science Requirement) ³	5
	15	15

Sophomore

Fall	Hours Spring	Hours
Goal 3 Humanities	3 Goal 4.1 US Diversity	3
MATH 116 (General Science Requirement) ¹	3 CHEM 335 (General Science Requirement) ³	3
CHEM 330 (General Science Requirement)	3 BIOL 400 (Major Requirement) ⁵	3
CHEM 331 (General Science Requirement)	2 BIOL 402 (Major Requirement) ⁵	2
BIOL 350 (Major Requirement) ⁴	4 BIOL 416 (Major Requirement) ⁶	3
	Elective (Total Hours)	1
	15	15

Junior

Fall	Hours Spring	Hours
Goal 3 Social Science	3 Goal 5 Social Responsibility and Ethics	3

PHSX 211 & PHSX 216 (or PHSX 114, Goal 1.1 Critical Thinking, General Science Requirement)	4-5 PHSX 212 & PHSX 236 (or PHSX 115; General Science Requirement)	4
BIOL 405 (Major Requirement) ⁴	3 BIOL 600 (Major Requirement) ⁵	3
BIOL 400+ (Major Requirement) ⁷	3 BIOL 400+ (Major Requirement) ⁷	3
Elective (Total Hours) (Elective hours vary depending on which PHSX is taken)	2-3 Elective (Total Hours)	3
15-17		16

Senior

Fall	Hours Spring	Hours
Goal 4.2 Global Awareness	3 BIOL 599 (Goal 6 Integration & Creativity, Major Requirement) ⁶	1
MATH 365, BIOL 570, or PSYC 210 (General Science Requirement) ³	3-4 BIOL 430 (Major Requirement) ⁶	3
BIOL 400+ (Major Requirement) ⁷	1 BIOL 400+ (Major Requirement) ⁷	3
BIOL 601 (Major Requirement) ⁴	2 Elective (300+, if needed) (Total Hours)	3
BIOL 419, 420, 421, or 701 (Major Requirement) ⁷	2 Elective (Total Hours)	3
Elective (Total Hours)	3 Elective (Total Hours)	3
14-15		16

Total Hours: 121-124

¹ Requires MATH ACT scores of 26+, a comparable SAT or KU Math Placement Exam score, or credit for a MATH 101 or MATH 104 equivalent course. MATH 125 can be taken instead of MATH 115 and MATH 116 to fulfill the B.S. Molecular Biosciences math requirement.

² Concurrent or prior enrollment in CHEM 130 is required.

³ CHEM 135 and CHEM 335 are offered only in the spring (Lawrence campus). BIOL 570 is offered only in the fall (Lawrence campus).

⁴ BIOL 350, BIOL 405, and BIOL 601 are offered only on the Edwards campus in the fall.

⁵ BIOL 400, BIOL 402, and BIOL 600 are offered on the Edwards campus in both spring and summer semesters.

⁶ BIOL 416, BIOL 430, and BIOL 599 are offered on the Edwards campus only in the spring.

⁷ Twelve hours of BIOL 400+ level elective and seminar courses, including at least 2 hours of seminar/topics course (BIOL 419, BIOL 420, BIOL 421, BIOL 701). No more than 3 hours of BIOL 423 and/or BIOL 424 (combined) can be applied towards the elective requirements.

Please note:

All students in the College of Liberal Arts and Sciences are required to complete 120 total hours of which 45 hours must be at the Jr/Sr (300+) level.

The same course cannot be used to fulfill more than one KU Core Goal. However, overlap of a KU Core course with a major or degree-specific requirement is allowed. Overlapping is recommended to allow more opportunities to explore other majors and/or minors.

Departmental Honors

Undergraduate majors are eligible to graduate with honors in biology if they fulfill the following requirements:

1. Complete all course work required for the appropriate degree in biology.
2. Achieve a minimum grade-point average of 3.25 overall and 3.5 in the major.
3. Complete BIOL 499 Introduction to Honors Research with a grade of B or higher.
4. Complete BIOL 699 Biology Honors Research Colloquium with a grade of B or higher.
5. Complete an independent research project under the supervision of a faculty member in an area appropriate to the degree sought.
6. Submit an honors thesis to the honors committee once the research is complete and present the results of the completed research at the honors research symposium.

Students majoring in Human Biology with Anthropology, Applied Behavioral Science, Psychology, or Speech-Language-Hearing concentrations will follow the honors requirements for their respective concentration department.

Specific guidelines and intent forms are available in the Undergraduate Biology Program office and online (<http://www.kuub.ku.edu>). Candidates must declare their intent to graduate with honors at least 2 semesters before graduation.

Study Abroad

Consult an advisor at least 4 months before undertaking study abroad. Consult the Office of Study Abroad (<http://www.studyabroad.ku.edu>), 108 Lippincott Hall, for information about study in one of the many countries (e.g., Scotland, Australia, Switzerland) with special arrangements with KU.