



ACADEMIC PROGRAM – ADDITIONAL INFORMATION FORM

To be used once the preliminary proposal has been approved.

Request to Establish New Academic Program in Arizona

University: University of Arizona

Name of Proposed Academic Program: Bachelor of Arts in Molecular and Cellular Biology
Academic Department: Molecular and Cellular Biology, College of Science
Geographic Site: Tucson- Main Campus and Arizona Online
Instructional Modality: Online
Total Credit Hours:



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120

Proposed Inception Term:

Fall 2024

Brief Program Description:

Molecular and cell biologists study the building blocks of living organisms. The Bachelor of Arts in Molecular and Cellular Biology is designed for students who wish to use their knowledge of biology in careers outside the laboratory including science policy, communication, informatics, business, education, public health, and law. Students take courses in biology, genetics, chemistry, bioethics, writing and more. The BA in MCB complements our existing BS in MCB and allows students to customize their studies by completing a minor or double major in their secondary field of interest.

Learning Outcome #1: Demonstrate understanding of the molecular and cellular mechanisms that govern life and apply that understanding to novel scenarios

Concepts: Students will apply knowledge of how chemical principles govern the activity of life to novel problems.

- * how cells sense and respond to internal and external cues
- * how traits are inherited
- * how molecules, cells, and organisms evolve
- * how phenotypes emerge from interactions among molecules and cells
- * how research with model organisms sheds light on all these questions.

Competencies: Students will demonstrate disciplinary knowledge in molecular and cellular biology. .

Assessment Methods: This outcome will be by administering the national GenBio-MAPs assessment (direct) and senior exit survey (indirect).

Measures: The national GenBio-MAPs assessment (direct) and senior exit surveys (indirect).

Learning Outcome #2: Communicate effectively in writing about scientific ideas and methods.

Concepts: Students will effectively write summaries of scientific research and/or explanation of scientific concepts.

Competencies: Students will demonstrate their understanding of biological concepts and methods in writing.

Assessment Methods: This outcome will be assessed in capstone paper and presentation (direct) and senior exit survey (indirect).

Measures: Instructor grading of papers and presentations (direct) and senior exit survey (indirect).

Learning Outcome #3: Evaluate the reliability of sources of information about biology.

Concepts: Students will read and critique texts, essays, scholarly reviews, and primary literature in biology.



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Competencies: Students will demonstrate their ability to locate and evaluate reliable sources of information in scholarly and popular sources.
Assessment Methods: This outcome will be assessed in capstone paper (direct) and senior exit survey (indirect).
Measures: Instructor grading of capstone paper (direct) and senior exit survey (indirect).
Learning Outcome #4: Interpret and explain experimental data to a variety of nonexpert audiences.
Concepts: Students will effectively communicate in a variety of modalities (written, oral, graphic, and/or media) the concept, methods, and practices of biology to a variety of nonexpert audiences.
Competencies: Students will demonstrate their ability to synthesize and explain reliable scientific information for the public.
Assessment Methods: This outcome will be assessed in capstone course public understanding communication project (direct) and senior exit survey (indirect).
Measures: Instructor grading of capstone course public understanding communication project (direct) and senior exit survey (indirect).
Learning Outcome #5: Demonstrate ability to analyze the role of biology in societal decisions and apply ethical decision-making to evaluate existing and new scientific approaches
Concepts: Students will identify ethical issues, assess the relevant stakeholders, and use ethical reasoning to propose solutions to societal problems.
Competencies: Students will demonstrate their ability to evaluate the effects of new scientific approaches on a variety of audiences. .
Assessment Methods: This outcome will be assessed in capstone case study (direct) and senior exit survey (indirect).
Measures: Instructor grading of capstone case studies (direct) and senior exit survey (indirect).

Curriculum Map

Outcomes	Courses							
	MCB 181R and L	ECOL 181R and L	MCB 301 or MCB 411	MCB 304 or ECOL 320	MCB 305 or MCB 410	MCB 404	ENG 308 or 313	MCB 401
Learning Outcome #1: Students will apply knowledge of how chemical principles govern the activity of life to	I	I	R	R	R			M Assessment Activity



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novel problems.								
Learning Outcome #2: Communicate effectively in writing about scientific ideas and methods.	I	I	R	R	R	R		M Assessment Activity
Learning Outcome #3: Evaluate the reliability of sources of information about biology.	I	I	R	R	R	R		M Assessment Activity
Learning Outcome #4: Interpret and explain experimental data to a variety of nonexpert audiences.						R	I	M Assessment Activity
Learning Outcome #5: Demonstrate ability to analyze the role of biology in societal decisions and apply ethical decision-making	I			R		R		M Assessment Activity



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to evaluate existing and new scientific approaches								
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XI. PROGRAM ASSESSMENT PLAN-

Assessment Measure	Source(s) of Evidence	Data Collection Point(s)
Capstone exam: GenBio-MAPs assessment	Score items aligned with concepts in LO#1 on the validated national GenBio-MAPs assessment.	After completion of core course
Capstone paper	Score on rubric criteria aligned with LO#2 and LO#3. Rubric criteria adapted from AACU Inquiry and Analysis, Written Communication, Critical Thinking, and Information Literacy Value Rubric.	During capstone course.
Capstone case study analysis.	Score on rubric criteria aligned with LO#3-LO#5. Rubric criteria adapted from AACU Written Communication, Information Literacy Value Rubric, and Ethical Reasoning Value Rubric.	During capstone course
Public understanding communication project.	Score on rubric criteria adapted from AACU Written Communication and Information Literacy Value Rubrics.	During capstone course
Senior survey	Response to questions asking graduating students how well the major prepared them to master LO#1-LO#5.	During capstone course.
Graduate School Admissions and Job Placement Statistics	Student/Alumni Survey	At graduation and as part of alumni survey
Academic Program Review	Reviewers' responses	Every 7 years

Projected Enrollment for the First Three Years:



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Based on enrollment in other College of Science majors with both BS and BA degrees available, we conservatively estimate that annual enrollment in the BA in MCB will be about 10% of the annual enrollment in the existing BS in MCB. Availability of the program online may drive these numbers higher.

Year 1	Year 2	Year 3
10	25	40

Evidence of Market Demand:

1. The US Department of Labor estimates the job growth for people with bachelor's degrees in biology will increase by 4-7% in the next 10 years. Many of the jobs that do not require further education are in the fields of management and education rather than the research and medicine. Providing students who do not plan on going to medical or graduate school a more flexible degree will allow them to explore areas where they can apply their STEM training to careers outside of healthcare of the laboratory.
2. Lightcast forecasting report for Cell/Cellular and Molecular Biology programs projects a 9.2% increase in jobs for people with MCB degrees by 2027.
3. A Spring 2022 survey of MCB majors and MCB 181R students showed that students are interested in the BA option.
 - a. 27% of non-MCB majors said they would consider a BA in MCB as a major or second major. Another 24% said they were interested but unsure.
 - b. 28% of current MCB majors said they would be interested in a BA in MCB as a major or second major. Another 22% said they were interested but unsure.
 - c. Comments included:
 - i. "I think its a nice opportunity for people. i wish i had the option to choose that because i may have ended up doing the BA instead of a BS if i was offered it."
 - ii. "It sounds like a good option for someone who may not be pre-med."
 - iii. "This is a fantastic opportunity for other students! I do not fit the target audience because I am interested in research and am graduating this year, but I do personally know several people who would have absolutely loved to have done this had it been an option."
 - iv. "I think this would be a great option for people double-majoring, so I really support its creation."
 - v. "I graduate at the end of this current semester. if i was a freshman entering college and this option was available, I would take the BA route in a heartbeat."
 - vi. "I have always been interested more on the bioethical side of genetics rather than research and would like an opportunity to study this instead."

Similar Programs Offered at Arizona Public Universities:



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- ASU BA Biology
- UArizona BA Biochemistry
- UArizona BA Ecology and Evolutionary Biology

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Objection(s) Raised by Another Arizona Public University? YES NO

Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?

If Yes, Response to Objections:

Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.

New Resources Required? (i.e., faculty and administrative positions; infrastructure, etc.):

No infrastructure. We anticipate 0.1 FTE of new advisor time to advise the BA in MCB students.

Plan to Request Program Fee/Differentiated Tuition? YES **NO**

Estimated Amount: N/A

Program Fee Justification: N/A

Specialized Accreditation? YES **NO**

Accreditor: N/A