

For Academic Affairs and Research Use Only	
Proposal Number	
CIP Code:	
Degree Code:	

NEW OR MODIFIED COURSE PROPOSAL FORM

Undergraduate Curriculum Council

Graduate Council

New Course, Experimental Course (1-time offering), or Modified Course (Check one box)

Signed paper copies of proposals submitted for consideration are no longer required. Please type approver name and enter date of approval.

Jianfeng Xu 1/12/2023
Department Curriculum Committee Chair

	ENTER DATE...
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COPE Chair (if applicable)

	ENTER DATE...
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Department Chair

Fabricio Medina-Bolivar 1/12/2023
Head of Unit (if applicable)

John Hershberger 2/23/2023
College Curriculum Committee Chair

	ENTER DATE...
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Undergraduate Curriculum Council Chair

Mary Elizabeth Spence 2/16/2023
Office of Accreditation and Assessment (new courses only)

	ENTER DATE...
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Graduate Curriculum Committee Chair

Jennifer L. Bouldin 3/1/2023
College Dean

Len Frey	4/5/23
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Vice Chancellor for Academic Affairs

	ENTER DATE...
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General Education Committee Chair (if applicable)

1. Contact Person (Name, Email Address, Phone Number)
 Travis Marsico, tmarsico@astate.edu, 870-253-1410

2. Proposed starting term and Bulletin year for new course or modification to take effect

The proposed starting semester is Fall 2023

Instructions:

Please complete all sections unless otherwise noted. For course modifications, sections with a "Modification requested?" prompt need not be completed if the answer is "No."

3.

	Current (Course Modifications Only)	Proposed (New or Modified) <i>(Indicate "N/A" if no modification)</i>
Prefix		MBS
Number*		6353
Title (include a short title that's 30 characters or fewer)		Interdisciplinarity in Molecular Biosciences
Description**		At the intersection of at least three distinct disciplines, students will investigate histories of disciplines, historic overlap, data gaps, and future interdisciplinary advances through formal lectures, discussions, literature reviews, hands-on laboratory and computer activities, and field trips.

* Confirm with the Registrar's Office that number chosen has not been used before and is available for use. For variable credit courses, indicate variable range. *Proposed number for experimental course is 9.*

**Forty words or fewer (excepting prerequisites and other restrictions) as it should appear in the Bulletin.

4. Proposed prerequisites and major restrictions **[Modification requested? No]**

(Indicate all prerequisites. If this course is restricted to a specific major, which major. If a student does not have the prerequisites or does not have the appropriate major, the student will not be allowed to register).

a. **NO** Are there any prerequisites?

a. If yes, which ones?

NA

b. Why or why not?

As a graduate level course, it will not be available to undergraduates, and only graduate students in BIO, CS, ESCI, and MBS programs will be given registration access to the course. These students will already have completed sufficient graduate courses making prerequisites unnecessary

b. **YES** Is this course restricted to a specific major?

a. If yes, which major?

This course will be offered to MS, MA, and PhD students in BIO, CS, ESCI, and MBS programs.

5. Proposed course frequency **[Modification requested? No]**

(e.g. Fall, Spring, Summer; if irregularly offered, please indicate, "irregular.") *Not applicable to Graduate courses.*

NA

6. Proposed course type [Modification requested? No]

Will this course be lecture only, lab only, lecture and lab, activity (e.g., physical education), dissertation/thesis, capstone, independent study, internship/practicum, seminar, special topics, or studio? Please choose one.

Team taught by faculty members in BIO, CS, ABI, EVS, MBS with relevant experience, and will include formal lectures, literature review, discussion, hands-on laboratory and computer activities, and field trips.

7. Proposed grade type [Modification requested? No]

What is the grade type (i.e. standard letter, credit/no credit, pass/fail, no grade, developmental, or other [please elaborate])
This will be a standard letter, credit course

8. NO Is this course dual-listed (undergraduate/graduate)?

9. YES Is this course cross-listed?

(If it is, all course entries must be identical including course descriptions. Submit appropriate documentation for requested changes. It is important to check the course description of an existing course when adding a new cross-listed course.)

a. – If yes, please list the prefix and course number of the cross-listed course.

ESCI 6353

b. – Can the cross-listed course be used to satisfy the prerequisite or degree requirements this course satisfies?

YES

10. NO Is this course in support of a new program?

a. If yes, what program?

11. NO Will this course be a one-to-one equivalent to a deleted course or previous version of this course (please check with the Registrar if unsure)?

a. If yes, which course?

Enter text...

Course Details

12. Proposed outline [Modification requested? Yes/No]

(The course outline should be topical by weeks and should be sufficient in detail to allow for judgment of the content of the course.)

Week 1 Definition of interdisciplinarity

Week 2 History of important, transformative interdisciplinary thinking in science (e.g., the Modern Synthesis to reconcile the theory of evolution by natural selection and the genetic basis of inheritance)

Week 3 Difficulties in implementation (e.g., structural barriers; use of different terms and communication approach)

Week 4 History of disease ecology

Week 5 Current understandings in disease ecology

- Week 6 **Where the field of disease ecology is headed**
- Week 7 **History of biological invasions**
- Week 8 **Current understanding in biological invasions**
- Week 9 **Where the field of biological invasions is headed**
- Week 10 **History of biological data science**
- Week 11 **Current understanding in biological data science**
- Week 12 **Where the field of biological data science is headed**
- Week 13 **The search for meaningful overlap in fields**
- Week 14 **Current data gaps**
- Week 15 **Final presentations**

13. Proposed special features **[Modification requested? Yes/No]**
 (e.g. labs, exhibits, site visitations, etc.)

This course may include lab work and field trips to research sites relevant to disease ecology, invasion biology, and data science

14. Department staffing and classroom/lab resources

Department of Biological Sciences

- a. Will this require additional faculty, supplies, etc.?
NO

15. **NO** Does this course require course fees?
If yes: please attach the New Program Tuition and Fees form, which is available from the UCC website.

Justification

Modification Justification (Course Modifications Only)

16. Justification for Modification(s)

Enter text...

New Course Justification (New Courses Only)

17. Justification for course. Must include:

- a. Academic rationale and goals for the course (skills or level of knowledge students can be expected to attain)

Molecular Biosciences are inherently interdisciplinary, but the current curriculum does not include explicit course-based education into the history, merits, and complexities, of interdisciplinarity. In this first iteration of a course specifically addressing interdisciplinarity, disease ecology, biological invasions, and advanced computation will be investigated as separate but conceptually overlapping fields of study that can synergistically and transformatively be integrated.

- b. How does the course fit with the mission of the department? If course is mandated by an accrediting or certifying agency, include the directive.

This is an important addition to a thin selection of coursework that is flexible in its implementation but core to the interdisciplinary nature of molecular biosciences.

c. Student population served.

This course is serving graduate students associated with BIO, CS, ESCI, and MBS programs. This course is meant to enhance interdisciplinarity and expose students to the underutilized research potential and overlap between disease ecology, invasion biology, and computer science.

d. Rationale for the level of the course (lower, upper, or graduate).

This course must be a graduate level course because, among other groups, it is serving PhD students.

Assessment

Assessment Plan Modifications (Course Modifications Only)

18. Yes / No Do the proposed modifications result in a change to the assessment plan?

If yes, please complete the Assessment section of the proposal

Relationship with Current Program-Level Assessment Process (Course modifications skip this section unless the answer to #18 is "Yes")

19. What is/are the intended program-level learning outcome/s for students enrolled in this course? Where will this course fit into an already existing program assessment process?

The Molecular Biosciences Program has 3 learning outcomes:

- 1) Students will be able to demonstrate competency in the field of advanced cellular and molecular biology through course work, experimentation in the laboratory and ability to think critically about the biological processes as well their applications in their own research.
- 2) Students will complete a well-organized scientific study related to molecular biosciences. While accomplishing this, students will be able to think critically, develop hypotheses, review the literature, design and perform experiments, analyze and interpret data (results), write and defend a thesis/dissertation proposal.
- 3) Students will develop expertise in oral and written science communication skills.

The proposed course advances all three of the learning outcomes by taking three historically separate (or minimally overlapping) fields or subfields and assesses historical and potential links among the fields for transformative scientific advancement. In this way, scientific study will be critiqued and analyzed through the review of literature and plans for interdisciplinarity will be explored. Students will develop skills in written and oral communication through leading discussions and writing an analysis of an interdisciplinary topic. Students will demonstrate their knowledge in the field by effectively making connections between fields that have not taken full advantage of cross-communication.

20. Considering the indicated program-level learning outcome/s (from question #19), please fill out the following table to show how and where this course fits into the program's continuous improvement assessment process.

For further assistance, please see the 'Expanded Instructions' document available on the UCC - Forms website for guidance, or contact the Office of Assessment at 870-972-2989.

Program-Level Outcome 1 (from question #19)	Students will be able to demonstrate competency in the field of advanced cellular and molecular biology through course work, experimentation in the laboratory and ability to think critically about the biological processes as well their applications in their own research.
Assessment Measure	Written products presented to the class orally on an integrated interdisciplinary topic.
Assessment Timetable	Written product outcomes and results of student presentations will be reported to the MBS program director upon request as needed for program-level assessment.
Who is responsible for assessing and reporting on the results?	The course instructors are responsible for reporting results.

Program-Level Outcome 2 (from question #19)	Students will complete a well-organized scientific study related to molecular biosciences. While accomplishing this, students will be able to think critically, develop hypotheses, review the literature, design and perform experiments, analyze and interpret data (results), write and defend a thesis/dissertation proposal.
Assessment Measure	Class discussions and effective completion of class assignments.
Assessment Timetable	These assessments will be completed every semester the course is offered. Results will be reported to the MBS program director upon request as needed for program-level assessment.
Who is responsible for assessing and reporting on the results?	The course instructors are responsible for reporting results.

Program-Level Outcome 3 (from question #19)	Students will develop expertise in oral and written science communication skills.
Assessment Measure	Written products presented to the class orally on an integrated interdisciplinary topic.
Assessment Timetable	Written product outcomes and results of student presentations will be reported to the MBS program director upon request as needed for program-level assessment.
Who is responsible for assessing and reporting on the results?	The course instructors are responsible for reporting results.

(Repeat if this new course will support additional program-level outcomes)

Course-Level Outcomes

21. What are the course-level outcomes for students enrolled in this course and the associated assessment measures?

Outcome 1	Demonstrate understanding of historical underpinnings across three molecular biosciences disciplines.
Which learning activities are responsible for this outcome?	Lectures, literature readings, and group discussions.
Assessment Measure	Final writing assignment and presentation.

Outcome 2	Identify barriers to interdisciplinary research.
Which learning activities are responsible for this outcome?	Lectures, literature readings, group discussions, final report, and presentation.
Assessment Measure	Final writing assignment and presentation.

Outcome 3	Explore interdisciplinary overlap and identify current data gaps associated with implementation.
Which learning activities are responsible for this outcome?	Lectures, literature readings, group discussions, final report, and presentation.
Assessment Measure	Final writing assignment and presentation.

(Repeat if needed for additional outcomes)

Bulletin Changes

Instructions

Please visit <http://www.astate.edu/a/registrar/students/bulletins/index.dot> and select the most recent version of the bulletin. Copy and paste all bulletin pages this proposal affects below. Please include a before (with changed areas highlighted) and after of all affected sections.

*Please note: Courses are often listed in multiple sections of the bulletin. To ensure that all affected sections have been located, please search the bulletin (ctrl+F) for the appropriate courses before submission of this form.

MBS 6353 – Interdisciplinarity in Molecular Biosciences

At the intersection of at least three distinct disciplines, students will investigate histories of disciplines, historic overlap, data gaps, and future interdisciplinary advances through formal lectures, discussions, literature reviews, hands-on laboratory and computer activities, and field trips.