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**Course Revision Proposal Form**

**[X] Undergraduate Curriculum Council**

**[ ] Graduate Council**

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

Email completed proposals to [curriculum@astate.edu](mailto:curriculum@astate.edu) for inclusion in curriculum committee agenda.

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| --- | --- |
| David F. Gilmore 10/27/2017 **Department Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **COPE Chair (if applicable)** |
| Thomas Risch 10/27/2017 **Department Chair:** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Head of Unit (If applicable)** |
| David F. Gilmore 10/27/2017 **College Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Undergraduate Curriculum Council Chair** |
| Anne A. Grippo 10/27/2017 **College Dean** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Graduate Curriculum Committee Chair** |
| |  |  | | --- | --- | | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Enter date |   **General Education Committee Chair (If applicable)** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Vice Chancellor for Academic Affairs** |

1. Contact Person (Name, Email Address, Phone Number)

Asela J. Wijeratne  
Department of Biological Sciences  
Arkansas State University  
Phone: 870-972-3082  
Email: [awijeratne@astate.edu](mailto:awijeratne@astate.edu)

2. Proposed Starting Term and Bulletin Year for Change to Take Effect

Spring, 2018

3. Current Course Prefix and Number

BIO 4152 (In the bulletin, both Biotechniques I and Biotechniques II has been erroneously listed under the same prefix and number. The “second” BIO 4152 was approved as BIO 4154 in 2013.)

3.1 – [Yes] Request for Course Prefix and Number change

If yes, include new course Prefix and Number below. *(Confirm that number chosen has not been used before. For variable credit courses, indicate variable range. Proposed number for experimental course is 9. )*

**BIO 4163**

3.2 – If yes, has it been confirmed that this course number is available for use? Yes

*If no: Contact Registrar’s Office for assistance.*

4. Current Course Title

Laboratory in Biotechniques II

4.1 – [No] Request for Course Title Change

If yes, include new Course Title Below. *If title is more than 30 characters (including spaces), provide short title to be used on transcripts. Title cannot have any symbols (e.g. slash, colon, semi-colon, apostrophe, dash, and parenthesis). Please indicate if this course will have variable titles (e.g. independent study, thesis, special topics).*

5. – [Yes ] Request for Course Description Change.

If yes, please include brief course description (40 words or fewer) as it should appear in the bulletin.

Techniques in protein expression and functional analysis including recombinant DNA, protein expression systems, protein chemistry, chromatographic methods, and other analytical techniques. Laboratory 6 hours per week. Special course fees may apply. Prerequisites, BIO 4153 or permission of instructor. Spring.

6. – [Yes ] Request for prerequisites and major restrictions change.

*(If yes, 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).*

1. Are there any prerequisites? Yes / No
   1. If yes, which ones?

BIO 4153

* 1. Why or why not?

Biotechniques II is part of a two laboratory course series. Biotechniques II BIO 4163 is the second course in this series. Knowledge and techniques gained in BIO 4153 is required for this course. BIO 4153 or permission from instructor required to enroll in part 2 of the course.

1. Is this course restricted to a specific major? No
   1. If yes, which major? Enter text...

7. – [Yes ] Request for Course Frequency Change(e.g. Fall, Spring, Summer). *Not applicable to Graduate courses.*

a. If yes, please indicate new frequency:

Course offered every Spring

8. – [No ] Request for Class Mode Change

*If yes, indicate if this course will be lecture only, lab only, lecture and lab, activity, dissertation, experiential learning, independent study, internship, performance, practicum, recitation, seminar, special problems, special topics, studio, student exchange, occupational learning credit, or course for fee purpose only (e.g. an exam)? Please choose one.*

Enter text...

9. – [No ] Request for grade type change

*If yes, what is the grade type (i.e. standard letter, credit/no credit, pass/fail, no grade, developmental, or other [please elaborate])*

Enter text...

10. Is this course dual listed (undergraduate/graduate)? Yes

a. If yes, indicate course prefix, number and title of dual listed course.

BIO 5163 (Please see the justification section to see how undergraduate and graduate versions are different.)

11. Is this course cross listed? No

*(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.)*

1. If yes, please list the prefix and course number of cross listed course.

Enter text...

1. Are these courses offered for equivalent credit? Yes / No

Please explain. Enter text...

12. Is this course change in support of a new program? No

a. If yes, what program?

Enter text...

13. Does this course replace a course being deleted? Yes

a. If yes, what course?

Replacing current course listed erroneously as BIO 4152 Biotechniques II in the Bulletin. (Approved as BIO 4154 in 2013)

14. Will this course be equivalent to a deleted course or the previous version of the course? Yes

a. If yes, which course?

Most of the content of this course will be from the current version of BIO 4152 Biotechniques I and some of the content will be from the original BIO 4154 Biotechniques II. The content of these two sequential courses is being reorganized.

15. Does this course affect another program? No

16. Does this course require course fees? Yes, there is an existing course fee, which will not be changed.

*If yes: Please attach the New Program Tuition and Fees form, which is available from the UCC website.*

**Revision Details**

17. Please outline the proposed revisions to the course.

*Include information as to any changes to course outline, special features, required resources, or in academic rationale and goals for the course.*

goals of the course

* Demonstrate good laboratory practice.
* Be proficient in preparing buffers and making dilutions
* Be proficient in protein analytical techniques and understand the theory behind differing protocols
* Be proficient in blotting protocols
* Maintain an effective laboratory journal

Outline

1 Laboratory preparation for experiments

2-3 Restriction digestion and mapping of plasmids

4 Prepare *E.coli* and in silico cloning experiments

5 DNA for cloning including strategy preparation with restriction enzymes

6-7 Transformation of DNA into *E.coli*, amplification and purification of recombinant

plasmids, and sequencing reactions.

8 Introduce Pichia expression system, induce protein in yeast and set up a protein assay to demonstrate the presence of the induced protein

9 Grow & Induce Yeast, perform protein, enzyme assays and SDS PAGE

10-11 Introduce protein purification step (chromatography, HPLC, Maldi-Tof MS)

12-13 Perform Affinity Column Chromatography & Western blots

14 Discussion of the results and wrapping up

Enter text...

18. Please provide justification to the proposed changes to the course.

Two lab courses, BIO 4152 (Biotechniques I) and BIO 4154 (Biotechniques II, which has been erroneously listed under the same prefix and number, BIO 4152) arepart of a two-semester course that is central to the core curriculum of the Biotechnology BS program. Currently, these courses are assigned two different credit hours (2 and 4). Under the proposed changes, both courses will be designated with the same credit hours (3 each for both BIO 4153 and BIO 4163). This allows equally distributed teaching blocks to provide students adequate time to complete activities during each class session. In addition, instructional content for both courses in this series has been rearranged to improve delivery and logic-flow of this project-based laboratory series.

How undergraduate course is different from the graduate course:

Both undergraduate and graduate students will learn the same techniques. However, graduate students will be required to write research proposals, present literature reviews related to techniques in the class and perform additional preparatory work. These are aligned with what are expected for laboratory personnel holding a graduate degree.

19. Do these revisions result in a change to the assessment plan?

[Yes, this will affect the course level outcome, but not the program level outcomes. Please see below.]

*\*If yes: Please complete the Assessment section of the proposal on the next page.*

*\*If no: Skip to Bulletin Changes section of the proposal.*

***\*See question 19 before completing the Assessment portion of this proposal.***

**Assessment**

**University Outcomes**

20. Please indicate the university-level student learning outcomes for which this new course will contribute. Check all that apply.

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| --- | --- | --- |
| * 1. **[ ]** Global Awareness | * 1. **[ ]** Thinking Critically | * 1. **[ ]** Information Literacy |

**Relationship with Current Program-Level Assessment Process**

21. 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?

Enter text...

22. Considering the indicated program-level learning outcome/s (from question #23), 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.*

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| **Program-Level Outcome 1 (from question #23)** | Type outcome here. What do you want students to think, know, or do when they have completed the course? |
| Assessment Measure | Please include direct and indirect assessment measure for outcome. |
| Assessment  Timetable | What semesters, and how often, is the outcome assessed? |
| Who is responsible for assessing and reporting on the results? | Who (person, position title, or internal committee) is responsible for assessing, evaluating, and analyzing results, and developing action plans? |

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

**Course-Level Outcomes**

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

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| **Outcome 1** | At the end of BIO 4163, students will be able to do the following:   * Formulate a hypothesis and test it molecular biology techniques. |
| Which learning activities are responsible for this outcome? | * Create a hypothesis and research proposal * Combine results into two project reports. |
| Assessment Measure | • Rubrics will be developed to evaluate the lab reports and project reports. |

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| **Outcome 2** | At the end of BIO 4163, students will be able to do the following:   * Extract information from literature to incorporate them into testing and supporting a hypothesis. |
| Which learning activities are responsible for this outcome? | * Take-home assignment to show their understanding of the theoretical knowledge |
| Assessment Measure | • Rubrics will be developed to take-home assignments. |

*(Repeat if needed for additional outcomes)*

**Bulletin Changes**

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| **Instructions** |
| **Please visit** [**http://www.astate.edu/a/registrar/students/bulletins/index.dot**](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. Follow the following guidelines for indicating necessary changes.**  **\*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.**  - Deleted courses/credit hours should be marked with a red strike-through (~~red strikethrough~~)  - New credit hours and text changes should be listed in blue using enlarged font (blue using enlarged font).  - Any new courses should be listed in blue bold italics using enlarged font (***blue bold italics using enlarged font***)  *You can easily apply any of these changes by selecting the example text in the instructions above, double-clicking the ‘format painter’ icon 🡪 , and selecting the text you would like to apply the change to.*  *Please visit* [*https://youtu.be/yjdL2n4lZm4*](https://youtu.be/yjdL2n4lZm4) *for more detailed instructions.* |

**BIO 404V. Special Topics in Biological Sciences** Topical or technique driven seminar relating to the biological sciences that will lead to the training of students in a body of work, such as newly developed research technique and approach. Number of credit hours will vary. Special course fees may apply. Permission of Instructor required. May be repeated for a total credit of 6 hours. Fall, Spring.

**BIO 4103. Virology** The structure, function, and classification of viruses, and their impact on modern society and the biological world. Lecture three hours per week. Special course fees may apply. Prerequisites, BIO 2103 or BIO 3013 or BIO 4104 or BIO 4133. Fall, even.

**BIO 4104. Microbiology** Morphology, physiology, taxonomy and cultivation of bacteria, viruses, fungi, and protozoans with an emphasis on medically relevant bacteria. Relationship of microorganisms to animals, plants, and the environment. Lecture two hours per week and laboratory four hours per week. Prerequisites, CHEM 1023 and BIO 2013 or permission of instructor. Special course fees may apply. Fall, Spring, Summer, even.

**BIO 4111. Immunology Laboratory** Study of classical and current immunology techniques such as ELISA, immuno electrophoresis and Western Blot analysis. Laboratory 3 hours per week. Special course fees may apply. Prerequisites, BIO 2013 and CHEM 1013. Fall.

**BIO 4113. Immunology** Study of the human immune system. Topics include innate and acquired immunity, complement fixation and disorders of the immune system. Lecture 3 hours per week. Special course fees may apply. Prerequisites, BIO 2013 and CHEM 1013. Fall.

**BIO 4123. Cell Signaling** This course will provide an understanding of key concepts about cellular signaling mechanisms, major signaling pathways identified to date, and about the methods used to study these pathways. Three hours per week during spring semester. Special course fees may apply. Prerequisites, BIO 2013 or BIO 4133, or permission of the instructor. Spring, odd.

**BIO 4131. Cell Biology Lab** Two hours per week. To be taken concurrently with BIO 4133. Special course fees may apply. Spring.

**BIO 4133. Cell Biology** Organization and activities of cells, with emphasis on the ultrastructure and function of cellular organelles. Lecture three hours per week. Special course fees may apply. Prerequisites, BIO 2011, BIO 2013, CHEM 1023 and CHEM 1021. Spring.

**BIO 4143. Pharmacology** The study of drugs and their mechanisms of action at the system, cellular, and molecular levels. Special course fees may apply. Prerequisites, BIO 2203 and BIO 2223, or BIO 3223 and BIO 3233, BIO 4104, and CHEM 4243. Spring, even.

**~~BIO 4152. Laboratory in BioTechniques I~~** ~~Laboratory techniques in protein chemistry and analytical techniques. Techniques also include a variety of chromatographic methods, electrophoresis, UV-vis spectroscopy and radiochemistry. Laboratory 4 hours per week. Special course fees may apply. Prerequisite, BIO 3013. Spring. CHANGE SUBMITTED IN ACCOMPANYING SUBMISSION FORM~~

**BIO 4153. Laboratory in Biotechniques I** Laboratory techniques in DNA/RNA isolation, analysis and applications, including PCR, reverse transcriptase PCR, high-throughput sequencing sample preparation for gene expression products. Laboratory 6 hours per week. Special course fees may apply. Prerequisites, BIO 3013. Fall.

**~~BIO 4152. Laboratory in BioTechniques II~~** ~~Laboratory techniques in DNA/RNA isolation, analysis and applications, including PCR, reverse transcriptase PCR, recombinant DNA and the production of gene expression products. Laboratory 8 hours per week. Special course fees may apply. Prerequisite, BIO 4152~~.

**BIO 4163. Laboratory in Biotechniques II** Laboratory techniques in protein expression and functional analysis including recombinant DNA, protein expression systems, protein chemistry, chromatographic methods, and other analytical techniques. Laboratory 6 hours per week. Special course fees may apply. Prerequisites, BIO 4153 or permission of instructor. Spring.

**BIO 4201. Issues in Human Ecology Laboratory** Two hours per week. To be taken concurrently with BIO 4202. Special course fees may apply. Summer, odd.

**BIO 4202. Issues in Human Ecology** A broad ecological approach demonstrating problems of modern society such as environmental deterioration, hunger, and resource depletion. Lecture two hours per week. Special course fees may apply. Summer, odd.

**BIO 4211. Human Genetics Laboratory** Three hours per week. To be taken concurrently with BIO 4213. Special course fees may apply. Fall, odd.

**BIO 4213. Human Genetics** Current advances in the understanding of the human genome. Lecture three hours per week. Prerequisite, BIO 3013. Special course fees may apply. Fall, odd.