Code # Enter text…

**Course Revision Proposal Form**

**[] Undergraduate Curriculum Council**

**[X] 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 5154**

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 5163**

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 ll

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.

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 5153 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
   1. If yes, which ones?

BIO 5153

* 1. Why or why not?

Biotechniques II is part of a two laboratory course series. Biotechniques II BIO 5163 is the second course in this series. Knowledge and techniques gained in BIO 5153 required for this course. BIO 5153 or permission from instructor is required to enroll in part 2 of this course series.

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

7. – [No ] Request for Course Frequency Change(e.g. Fall, Spring, Summer). *Not applicable to Graduate courses.*

a. If yes, please indicate new frequency:

Enter text...

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 4163**  (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 as BIO 5154 Biotechniques II in the Bulletin.

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 5152 Biotechniques I and some of the content will be from the original BIO 5154 Biotechniques II. The content of these two sequential courses is being reorganized.l.

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 5152 (Biotechniques I) and BIO 5154 (Biotechniques II) arepart of a two-semester course that is central to the core curriculum of the Master’s Program in Biotechnology**.** 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). 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 the techniques to the class and perform additional preparatory work. These are aligned with what are expected for a laboratory personnel holding a graduate degree.

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

[Yes. However, overall contents of both BIO 5153 and BIO 5163 will remain similar to the two existing courses, BIO 5152 (Biotechniques I) and BIO 5154 (Biotechniques II), but they will be rearranged. Therefore, only the Course-Level Outcomes will be changed**.** ]

*\*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.

|  |  |  |
| --- | --- | --- |
| * 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.*

|  |  |
| --- | --- |
| **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. |

*(Repeat if needed for additional outcomes)*

|  |  |
| --- | --- |
| **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. |

**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.* |

**GRADUATE CATALOG PAGES 364-365**

**BIO 5123. Cell Signaling** This course will provide an understanding of key concepts about cellular signaling mechanisms, and major signaling pathways identified to date about the methods used to study these pathways. Three hours per week during spring semester. Prerequisite: Cell biology course(s) or permission of the instructor.

**BIO 5131. Laboratory for Cell Biology** Two hours per week. To be taken concurrently with BIO 5133. Special course fees may apply.

**BIO 5133. Cell Biology** A study of the organization and activities of cells, with emphasis on the ultrastructure and function of cellular organelles. Lecture three hours per week. Prerequisites: BIO 2013, BIO 2011; CHEM 1023, CHEM 1021.

**BIO 5143. Pharmacology** The study of drugs and their mechanisms of action at the system, cellular, and molecular levels. Prerequisites: BIO 2223 OR BIO 3233, BIOL 4104, and CHEM 4243.

**~~BIO 5152. 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 5153. 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. Fall.

**~~BIO 5154. 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 5152. Fall.~~

**BIO 5163. 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 5153 or permission of instructor. Spring.

**BIO 5201. Laboratory for Issues in Human Ecology** Two hours per week. To be taken concurrently with BIO 5202. Special course fees may apply.

**BIO 5202. Issues in Human Ecology** A broad ecological approach demonstrating problems of modern society such as environmental deterioration, hunger, and resources depletion. Lecture two hours per week.

**BIO 5213. Human Genetics** Current advances in the understanding of the human genome. Lecture three hours per week. Prerequisite: BIO 3013.

**BIO 5301. Aquatic Entomology** Identification, life histories, ecology of aquatic arthropods, with emphasis on freshwater insects. For students in wildlife management, fisheries management, aquatic biology, and advanced entomology. Lecture one hour per week. Prerequisites: BIO 3301, 3303; BIO 3023 OR BIO 4371 AND 4373.

**BIO 5302. Laboratory for Aquatic Entomology** Four hours per week. To be taken concurrently with BIO 5301. Special course fees may apply.

**BIO 5303. Forensic Entomology** The life history, ecology, and behavior of insects and related arthropods and how they affect the interpretation of potential crime scenes.

**BIO 5311. Fishery Biology** A study of identification, ecology, food habits, management, and behavior of fishes. Lecture one hour per week. Prerequisites: BIO 1301,1303.

**BIO 5312. Laboratory for Fishery Biology** Four hours per week. To be taken concurrently with BIO 5311. Special course fees may apply.

**BIO 5322. Biology of Marine Mammals Laboratory** Hands on experience on the classification, anatomy, and behavior of marine mammals. Concurrent enrollment in BIO 5323. Special Course fees may apply. Permission of instructor required.

**BIO 5323. Biology of Marine Mammals** This course analyzes the biology of marine mammals based on their adaptations to the aquatic environment from evolutionary, anatomical, physiological, and ecological perspectives. Prerequisites will be at least two of the following courses: BIO 3322, BIO 3013, BIO 3033, and permission of the instructor.

**BIO 5332. Animal Histology** Microscopic survey of cells and tissues of vertebrate organ systems. This is a pre-existing undergraduate course (BIO 4332). The graduate version will require grad students to investigate selected methods/topics beyond what is expected of undergrads. No