# Course Change Proposal

**Form A**

<table>
<thead>
<tr>
<th>Academic Group (College):</th>
<th>Academic Organization (Department):</th>
<th>Date:</th>
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<tbody>
<tr>
<td>NSM</td>
<td>Biological Sciences</td>
<td>03/12/10</td>
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</table>

**Type of Course Proposal:**

- [ ] New
- [x] Change
- [ ] Deletion

<table>
<thead>
<tr>
<th>Department Chair:</th>
<th>Submitted by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rose Leigh Vines</td>
<td>Nicholas Ewing</td>
</tr>
</tbody>
</table>

**Does this course fulfill a requirement for single-subject or multiple subject credential students?**

- [ ] Yes
- [x] No

For Catalog Copy:  

- [x] Yes
- [ ] No

CCE (Extension):  

- [ ] Yes
- [ ] No

<table>
<thead>
<tr>
<th>Semester Effective:</th>
</tr>
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<tbody>
<tr>
<td>Fall [x] Spring [ ] 2011</td>
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This course replaces experimental course Subject Area (prefix) and Catalog Nbr (course number):  

- [x] Yes
- [ ] No

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**Change from:**

**Subject Area (prefix) & Catalog Nbr (course no.):**  

- BIO 180  

**Title:**  

- Molecular Biology and Molecular Biology Laboratory  

<table>
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<tr>
<th>Units:</th>
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<tr>
<td>2</td>
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**Change to:**

**Subject Area (prefix) & Catalog Nbr (course no.):**  

- BIO 180  

**Title:**  

- Advanced Molecular Biology  

<table>
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<tr>
<th>Units:</th>
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<tr>
<td>4</td>
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**JUSTIFICATION:**

The Department of Biological Sciences is revising its curriculum to speed time to graduation for students, provide a stronger alternative structure to its core classes and substantially improve the linkage between its prerequisite courses and those that follow. To accomplish this, we are revising our current upper division Molecular Biology course (BIO 180) and the separate Molecular Biology Laboratory course (BIO 181) into an Advanced Molecular Biology course with Laboratory. The new BIO 180 will directly advance the student learning outcomes established for our proposed Intermediate Molecular Cell Biology course (BIO 121). Students will learn to analyze organisms at the molecular levels, skills critical to biotechnology industry and the growing opportunities in stem cell research and development. This will provide students with the opportunity to broaden their skill set to be fully prepared for the high-tech marketplace. It is critical to have a well-prepared workforce for the biotechnology industry and in stem cell research and development, where these industries are important components of the local and state economies.

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**NEW COURSE DESCRIPTION:** (Not to exceed 80 words, and language should conform to catalog copy. See http://www.csus.edu/omanual/acad.htm - Guidelines for Catalog Course Description)

Examination of the structure of genes and genomes, the mechanisms by which they change, and the use of evolutionary relationships to understand function. Mechanisms of the regulation of gene expression from gene to phenotype and the tools used to study these processes. Applications of molecular tools in medicine and biotechnology and the ethics around these approaches. **Prerequisites: BIO 121 and 184.** Lecture two hours. Laboratory six hours. **Units: 4.0.**

**Note:** Fee course.

**Prerequisite:** BIO 121 and 184  

**Enforced at Registration:**  

- [x] Yes  
- [ ] No

**Corequisite:**  

**Enforced at Registration:**  

- [ ] Yes  
- [x] No

**Graded:**  

- [x] Letter  
- [ ] Credit/No Credit

**Instructor Approval Required:**  

- [ ] Yes  
- [x] No

**Course Classification (e.g., lecture, lab, seminar, discussion):**  

- C2 and C16

**Title for CMS (not more than 30 characters):**  

- Advanced Molecular Biology

**Cross Listed?**  

- [ ] Yes  
- [x] No

**If yes, do they meet together and fulfill the same requirement, and what is the other course?**  

**How Many Times Can This Course be Taken for Credit?**  

- [ ] 1

**Can the course be taken for Credit more than once during the same term?**  

- [ ] Yes  
- [x] No
FOR NEW COURSE PROPOSALS OR SUBSTANTIVE CHANGES ONLY:

**Description of the Expected Learning Outcomes:** Describe outcomes using the following format: “Students will be able to: 1), 2), etc.” See the example at http://www.csus.edu/acaf/example.htm

**Students will:**

1. build upon their understanding of the gene as the fundamental unit of inheritance.
2. be able to identify potential genes and gene products and to compare genes, genomes, and gene products to reveal evolutionary patterns that provide insight into biological function.
3. be able to identify key model organisms and to describe why the evolutionary relationships between organisms enable us to use these models so effectively to understand biology.
4. understand that the control of gene expression is the fundamental mechanism by which genetic information (genotype) is translated into phenotype and be able to describe the levels at which gene expression can be regulated.
5. be able to describe the basic tools of molecular biology that are used to understand the structure of genes and genomes and the regulation of gene expression and be able to design experiments in which these tools are used to address unanswered questions.
6. be able to describe how the tools of molecular biology are being applied in medicine and biotechnology, identify some of the limitations of these techniques, and discuss examples of the ethical questions that surround them.

**Attach a list of the required/recommended course readings and activities [Note: it is understood that these are updated and modified as needed by the instructor(s).] This attachment should be forwarded only to your Dean's office, not Academic Affairs.**

**Assessment Strategies:** A description of the assessment strategies (e.g., portfolios, examinations, performances, pre- and post-tests, conferences with students, student papers) which will be used by the instructor to determine the extent to which students have achieved the learning outcomes noted above:

**In-class and take-home exams, quizzes, laboratory notebooks, written assignments, and oral presentations.**

**For whom is this course being developed?**

<table>
<thead>
<tr>
<th>Majors in the Dept</th>
<th>Majors of other Depts</th>
<th>Minors in the Dept</th>
<th>General Education</th>
<th>Other</th>
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<tbody>
<tr>
<td><em>X</em></td>
<td></td>
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Is this course required in a degree program (major, minor, graduate degree, certificate)?

Yes  _X_  No  

If yes, identify program(s): B.S. Biological Sciences, Concentrations in Molecular Cell Biology, Microbiology, and Forensic Biology

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer facilities, faculty, etc.)? 

Yes  _X_  No  

The lab portion of the new BIO 180 will be similar to the current BIO 181, which will be deleted and its resources used for the new BIO 180.

If yes, attach a description of resources needed and verify that resources are available.

Indicate which department or programs will be affected by the proposed course (if any).

_ _ _ _ _ _ _ _ _ _ _ Biological Sciences

**The Department Chair's signature below indicates that affected programs have been sent a copy of this proposal form.**

**Approvals:** If proposed change, new course or deletion is approved, sign and date below. If not approved, forward without signing to the next reviewing authority, and attach an explanatory memorandum to the original copy.

<table>
<thead>
<tr>
<th>Signatures:</th>
<th>Date</th>
</tr>
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<tbody>
<tr>
<td>Department Chair:</td>
<td>10/12/10</td>
</tr>
<tr>
<td>College Dean or Associate Dean:</td>
<td>11/9/10</td>
</tr>
<tr>
<td><strong>CPSP (for school personnel courses ONLY)</strong></td>
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</tbody>
</table>

**Associate Vice President**

and Dean for Academic Programs

Distribution: Academic Affairs (original), Department Chair and College Dean. Dean's office to send original after approval to Academic Affairs, at mail zip 6016. An electronic copy must also be sent.

9/10/2008