Washington State University  
MAJOR CURRICULAR CHANGE FORM -- NEW/RESTORE COURSE

- Please attach rationale for your request, a complete syllabus, and explain how this impacts other units in Pullman and other campuses (if applicable).
- Obtain all required signatures with dates.
- Provide original stapled packet of signed form/rationale statement/syllabus PLUS 10 stapled copies of complete packet to the Registrar's Office, campus mail code 1035.
- Submit one electronic copy of complete packet to wsu.curriculum@wsu.edu.

<table>
<thead>
<tr>
<th>Requested Future Effective Date: Spring 2016 (term/year) Course Typically Offered: Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEADLINES: For full term effective date: October 1st; for spring or summer term effective date: February 1st. See instructions.</td>
</tr>
<tr>
<td>NOTE: Items received after deadlines may be put to the back of the line or forwarded to the following year. Please submit on time.</td>
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</tbody>
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☐ New Course  ☐ Temporary Course  ☐ Restore Course

<table>
<thead>
<tr>
<th>MBioS</th>
<th>525</th>
<th>Advanced Topics in Genetics</th>
</tr>
</thead>
<tbody>
<tr>
<td>course subject/crosslist</td>
<td>course no.</td>
<td>title</td>
</tr>
<tr>
<td>V 1-2</td>
<td>( _ )</td>
<td>Recommended Prep: MBioS 503 or an equivalent course providing a basic understanding of molecular biology or molecular genetics.</td>
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<table>
<thead>
<tr>
<th>Credit hrs</th>
<th>lecture hrs per week</th>
<th>lab or studio hrs per week</th>
<th>prerequisite</th>
</tr>
</thead>
</table>

Description for catalog: V 1-3. May be repeated for credit; cumulative maximum 4 hours.
Recent genetics research in selected areas.

Additional Attributes: Check all that apply.
☐ Crosslisting (between WSU departments)*
☐ Variable credit: 1-3
☐ Conjoint listing (400/500):
☐ Repeat credit (cum. max. hrs): 4

Special Grading: ☐ S, F; ☐ A, S, F (PEACT only); ☐ S, M, F (VET MED only); ☐ H, S, F (PHARMACY, PHARDSCI only)
☐ Cooperative with UI
☐ Other (please list request):

The following items require prior submission to other committees/depts. (SEE INSTRUCTIONS.)
☐ Request to meet Writing in the Major [M] requirement (Must have All-University Writing Committee Approval.)
☐ Request to meet UCORE in __________________ (Must have UCORE Committee Approval >> See instructions.)
☐ Special Course Fee __________________ (Must submit request to University Receivables.)

Contact: Kwan Hee Kim  
Email: khkim@vetmed.wsu.edu  
Phone number: 335-7022  
Campus mail code: 7520  
Instructor, if different: Patricia Hunt & Terry Hassold

Chair (if crosslisted/interdisciplinary)*  
Dean (if crosslisted/interdisciplinary)*  
UCORE Committee Approval Date

All-University Writing Com / date  
Catalog Subcommittee Approval Date  
GSC or AAC Approval Date  
Faculty Senate Approval Date

*If the proposed change impacts or involves collaboration with other units, use the additional signature lines provided for each impacted unit and college.
Proposal to convert MBioS 525 (Advanced Topics in Genetics) to a modular format (Revised 11/30/15)

1. Rationale Statement

We request that MBioS 525 (Advanced Topics in Genetics) be changed from a variable 1-2 credit course to a variable 1-3 credit course.

i. Justification for why the course is not a standard 3-credit course.

The SMB faculty has determined that it is advantageous to increase the flexibility of elective course offerings in the PhD in Molecular Biosciences degree program by offering a variable 1-3 credit, modular courses. Students will have the flexibility to sign up only for those modules (credits or topics) that are most appropriate to their interests and/or their Program of Study. Thus, we think that the request to change MBioS 525 to variable 1-3 credits will make this course more accessible graduate students in all CVM PhD programs and to students from other life science graduate programs at WSU. The SMB faculty also recognizes that a variable credit, modular course can be versatile, that we can add a new topic and subtract a topic annually, or even offer a topic every other year, based upon programmatic/curricular assessment and faculty/student interests, needs, and evaluations.

In any given semester (Spring semester for MBioS 525), there will be 1-3 modules (credits) of the course offered, all during non-overlapping 5-week blocks. Each credit will be a 5-week module, with a total contact time of 15 hours, on a single contemporary topic under the broader subject of Genetics. Each credit is independent of each other and it is not in a sequence. Two sample syllabi, each for a 1-credit offering, are attached to this Major Curriculum Change form. The other 1-credit modules will be constructed in a similar fashion — only difference is that the pedagogical content will be distinct for each credit.

ii. Clarification of whether the course will have variable credits annually or whether students can take the course for different number of credits on numerous occasions.

One to three modules (credits) of the course will be offered in a semester, during non-overlapping 5-week blocks in MBioS 525. Students will be allowed to take the variable, modular course for one credit to a maximum of 4 credits total (one topic to four different topics) during their Program of Study in the graduate school. For example, students can take 2 credits in one semester and another 2 credits in their third semester or any number of variations. Furthermore, students can take the third module in their second semester of graduate education and then take the first module in their third semester, because each module is separate and they are not in sequence.

iii. If students can repeat a course for more credits, what are the specific requirements for each incremental credit?

Each credit consisting of a 5-week module will be on a different topic under the broader subject of Genetics in MBioS 525. The workload expectation and deliverables would be scaled
appropriately for an additional credit. For example, if a student were to take 2-credit modules, the student will have 15 contact hours per week for 10 weeks (two 5-week modules). Moreover, the assessments would be scaled appropriately with 2 exams and double amount of homework and oral assignments as deemed necessary.

2. S/U vs Grade courses

MBioS 525 is a graded course (see table below).

3. Syllabus (Appendix)

Two sample syllabi, each for a 1-credit offering, are listed at the end of this Major Curriculum Change form. Each credit is independent of each other and it is not in a sequence.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>1st credit (first 5 weeks)</th>
<th>2nd credit (second 5 weeks)</th>
<th>3rd credit (third 5 weeks)</th>
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</thead>
<tbody>
<tr>
<td>Workload expectations</td>
<td>Each credit will be a 5-week module, with a total contact time of 15 hours. Read papers and participate in class discussion; written and oral presentations; and problem sets.</td>
<td>Each credit will be a 5-week module, with a total contact time of 15 hours. Read papers and participate in class discussion; hands-on workshop; written and oral presentations; and problem sets.</td>
<td>Each credit will be a 5-week module, with a total contact time of 15 hours. Read papers and participate in class discussion; written and oral presentations; and problem sets (could have an additional variation).</td>
</tr>
<tr>
<td>Deliverables</td>
<td>2013 marked the 10th anniversary of the sequencing of the human genome and the 60th anniversary of the discovery of the DNA double helix. Advances in genetics (the study of individual genes) and genomics (the study of an entire genome) have fundamentally altered our understanding of biology. This course</td>
<td>Humans have been genetically modifying plants and animals by selective breeding for centuries. The ability to selectively modify the genome using engineering strategies began in the late 20th century, but has already had a tremendous impact on our daily lives. This module focuses on past and current approaches to</td>
<td>At this point there is no 3rd credit module planned. However, we are requesting for the third credit as we expect a third topic under the broader subject of Genetics will be offered soon. We are requesting to add the third credit now to avoid additional paperwork later on the part of the Registrar's office and GSC and Faculty</td>
</tr>
</tbody>
</table>
| Course Structure (Examples of information required - Please mention if not applicable) | i. Topic 1 is Genes, Genome and Society. Read papers and participate in class discussion; written and oral presentations; and problem sets.  

ii. 5 weeks  

iii. independently offered and students may register independently. It is not in a sequence.  

iv. no specific limit  

v. A sample schedule shown at the end of this application | i. Topic 2 is Genetically Modifying Organisms. Read papers and participate in class discussion; hands-on workshop; written and oral presentations; and problem sets.  

ii. 5 weeks  

iii. independently offered and students may register independently. It is not in a sequence.  

iv. no specific limit  

v. A second sample schedule shown at the end of this application | i. Topic is different from Topic 1 and 2, but under the broader subject of Genetics. Read papers and participate in class discussion; written and oral presentations; and problem sets (could have an additional variation)  

ii. 5 weeks  

iii. independently offered and students may register independently. It is not in a sequence.  

iv. no specific limit  

v. The other 1-credit modules will be constructed in a similar fashion — only difference is that the pedagogical content will be distinct for each credit. |
| Grading | Each module will be graded separately. If they could be reported separately, that would be the best. But, if not, an average of two or three modules could be reported, with each module weighing equally. A grade for each module is based on specific criteria as mentioned in the text. | Each module will be graded separately. If they could be reported separately, that would be the best. But, if not, an average of two or three modules could be reported, with each module weighing equally. A grade for each module is based on specific criteria as mentioned in the text. | Each module will be graded separately. If they could be reported separately, that would be the best. But, if not, an average of two or three modules could be reported, with each module weighing equally. A grade for each module is based on specific criteria as mentioned in the text. |
MBioS 525
Advanced Topics in Genetics:
Genes, Genomes, and Society

1 Credit

Spring 2016

Instructors:
Patricia Hunt
BLS 333
Office Hours: by appointment
Phone: 5-4954
email: pathunt@vetmed.wsu.edu

Terry Hassold
BLS 332
Office Hours: By appointment
Phone: 5-4953
Email: terryhassold@vetmed.wsu.edu

Course meeting times and days: MWF 9:10-10:00 AM
Room: TBD

Description
2013 marked the 10th anniversary of the sequencing of the human genome and the 60th anniversary of the discovery of the DNA double helix. Advances in genetics (the study of individual genes) and genomics (the study of an entire genome) have fundamentally altered our understanding of biology. This course will focus on current topics in human genetics, exploring the science and discussing the philosophical, ethical and societal concerns raised by recent scientific advances.

Recommended Preparation: MBioS 503 or an equivalent course providing a basic understanding of molecular biology or molecular genetics.

Course Grading: Students are required to read all assigned papers and participate in class discussions. Grades will be based on the following assessments:
1. Participation -30 points. Class attendance is mandatory and students are required to read all assigned papers and be able to contribute to the class discussion of concepts and explain data in individual figures/tables and the authors' interpretations.

2. Problem sets -20 points. Students will be required to complete two problem sets during the course, each worth 10 points. Each problem will be outlined in class and students will be provided with individual data sets and asked to evaluate them, generate figures summarizing the data, provide a written interpretation of the results, and be prepared to present their findings during the next class session.

3. Oral presentation-50 points. Students will choose a paper from a topic list provided during the first week of class, write a brief News and Views type summary of it, and provide a brief oral presentation in class. Written and oral presentations (25 points each) will be assessed on the basis of clarity, appropriate coverage of the topic, and ability of the student to handle questions posed following the oral presentation.

Grading Overview:

<p>| | |</p>
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<tbody>
<tr>
<td>Participation</td>
<td>30 pts</td>
</tr>
<tr>
<td>Problem Sets</td>
<td>2 x 10 pts</td>
</tr>
<tr>
<td>Written Presentation</td>
<td>25 pts</td>
</tr>
<tr>
<td>Oral Presentation</td>
<td>25 pts</td>
</tr>
<tr>
<td>Total</td>
<td>100 pts</td>
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</table>

Grade Distribution:

<table>
<thead>
<tr>
<th>Percentage Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-100%</td>
<td>A</td>
</tr>
<tr>
<td>80-89%</td>
<td>B</td>
</tr>
<tr>
<td>70-79%</td>
<td>C</td>
</tr>
<tr>
<td>60-69%</td>
<td>D</td>
</tr>
<tr>
<td>&lt;60%</td>
<td>F</td>
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Late Assignment Policy: It is expected that all assignments will be submitted in a timely fashion. Failure to do so will result in a 5 pt reduction. Exceptions will, of course be made in the event of extenuating circumstances.

**Learning objectives**

**At the end of this course students will be able to:**

a. Describe the basic features of the human genome and the complexities of human gene mapping.

b. Demonstrate a working knowledge of human gene mutations, their frequency and their causes.

c. Understand the potential risks to the human genome posed by environmental factors and assisted reproductive technologies.
Put in here a map of Learning objectives onto course assessments

<table>
<thead>
<tr>
<th>Learning Objective</th>
<th>How assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe the basic features of the human genome and the complexities of human gene mapping</td>
<td>In class discussion Assigned papers</td>
</tr>
<tr>
<td>Demonstrate a working knowledge of human gene mutations, their frequency and their causes.</td>
<td>In class discussion Problem set Assigned papers</td>
</tr>
<tr>
<td>Understand the potential risks to the human genome posed by environmental factors and assisted reproductive technologies.</td>
<td>In class discussion Problem set Assigned papers</td>
</tr>
</tbody>
</table>

Assigned reading for class

NY times Opinion "My Medical Choice" Angelina Jolie. 5/14/2013
http://www.nytimes.com/2013/05/14/opinion/my-medical-choice.html?smid=pl-share
NY times "Jolie's disclosure of preventative mastectomy highlights dilemma. 5/14/2013
Regalado (2014) For one baby, life begins with genome revealed. MIT Review

Papers for student assignments


Student Conduct Statement
Students are encouraged to work with classmates to understand the assigned papers and discussion materials. However, each student must independently demonstrate an understanding of the assigned material in class discussions. Students who violate WSU's Standards of Conduct for Students will receive an F as a final grade in this course, will not have the option to withdraw from the course and will be reported to the Office Student Standards and Accountability. Cheating is defined in the Standards for Student Conduct WAC 504-26-010 (3). It is strongly suggested that you read and understand these definitions.

Accommodation Policy
Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, please visit the Access Center (Washington Building 217; 509-335-3417) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center. For more information, contact a Disability Specialist: http://accesscenter.wsu.edu, Access.Center@wsu.edu

Safety Statement
Washington State University is committed to enhancing the safety of the students, faculty, staff, and visitors. It is highly recommended that you review the Campus Safety Plan (http://safetyplan.wsu.edu/) and visit the Office of Emergency Management web site (http://oem.wsu.edu/) for a comprehensive listing of university policies, procedures, statistics, and information related to campus safety, emergency management, and the health and welfare of the campus community.

Tentative Schedule of Studies for Genes, Genomes, and Society (1 credit)

Week 1 Introduction
Lecture 1 - Welcome, course organization (Topic paper selection)
Lecture 2 - Genes and genomes, a primer
Lecture 3 - The human genome and human gene mapping tools

Week 2 Assessing genetic disease risk and choosing to know
Lecture 4 - Huntington's disease
Lecture 5 - Prenatal screening and diagnosis
Lecture 6 - Problem set: Babies as transplant donors: 'savior siblings'

Week 3
Lecture 7 - Genetics and cancer
Lecture 8 - Copy number variation and genetic disease
Lecture 9 - Problem set: Treating untreatable disorders: a Down syndrome example

Week 4
Environmental effects on genetic risk
Lecture 10 - Developmental origins of adult health and disease
Lecture 11 - Assisted reproductive technology and genetic diagnosis
Lecture 12 - Mitochondrial disease treatment

Week 5
Presentation of student papers
Lecture 13 – First set
Lecture 14 – Second set
Lecture 15 – Third set

Second Tentative Schedule of Studies for Genetically Modifying Organisms (1 credit)

Week 1
Introduction
Lecture 1 - Welcome, course organization
Lecture 2 - Gene modification: an historical primer and outline of concepts
Lecture 3 - Genome editing, Germ cells, ESCs, EGS, and iPSCs

Week 2
Transgenic technology and the mouse
MLK holiday - no class
Lecture 4 - Transgenics, chimaeras, and germline transmission; paper discussion
Lecture 5 - Workshop: Make a genetically modified mouse in a day
First problem set due at next class

Week 3
Tools for modifying gene expression
Lecture 6 - Workshop discussion and intro to model systems and approaches
Lecture 7 - The worm and RNAi; paper discussion
Lecture 8 - Workshop: Do a worm RNAi experiment in a day
Second problem set due at next class

**Week 4  The CRISPR revolution**

Lecture 9 - Workshop discussion and introduction to CRISPR technology
Lecture 10 - CRISPR based methodologies for genome editing; paper discussion
Lecture 11 - The Future: CRISPR therapeutics, genome edited livestock

**Week 5  GMOs: What's all the fuss?**

Lecture 12 - Introduction to genetically modified foods
Lecture 13 - Paper discussion
Lecture 14 - Mock Congressional Hearing of California Proposition 37:
  Mandatory labeling of genetically engineered food