Fiscal Unit/Academic Org	Molecular Genetics - D0340
Administering College/Academic Group	Biological Sciences
Co-adminstering College/Academic Group	
Semester Conversion Designation	Converted with minimal changes to program goals and/or curricular requirements (e.g., sub-plan/specialization name changes, changes in electives and/or prerequisites, minimal changes in overall structure of program, minimal or no changes in program goals or content)
Current Program/Plan Name	Molecular Genetics Minor
Proposed Program/Plan Name	Molecular Genetics Minor
Program/Plan Code Abbreviation	MOLGEN-MN
Current Degree Title	

Credit Hour Explanation

Program credit hour requirements		A) Number of credit hours in current program (Quarter credit hours)	B) Calculated result for 2/3rds of current (Semester credit hours)	C) Number of credit hours required for proposed program (Semester credit hours)	D) Change in credit hours
Total minimum credit hours required for completion of program		24	16.0	14	2.0
Required credit hours offered by the unit	Minimum	19	12.7	9	3.7
	Maximum	19	12.7	14	1.3
Required credit hours offered outside of the unit	Minimum	5	3.3	0	3.3
	Maximum	5	3.3	0	3.3
Required prerequisite credit hours not included above	Minimum	33	22.0	18	4.0
	Maximum	33	22.0	18	4.0

Program Learning Goals

Note: these are required for all undergraduate degree programs and majors now, and will be required for all graduate and professional degree programs in 2012. Nonetheless, all programs are encouraged to complete these now.

Program Learning Goals

- Undergraduate Molecular Genetics minors acquire a basic mastery of fundamental concepts of biology, chemistry, mathematics, physics, and the scientific method.
- MG minors acquire a basic mastery of fundamental areas of genetics, including transmission genetics, central dogma, regulation of gene expression, quantitative and population genetics, genomics, recombinant DNA, and cell and developmental biology.
- Undergraduate Molecular Genetics minors develop analytical and problem solving skills in areas of genetics and molecular biology.
- Undergraduate Molecular Genetics minors acquire a basic mastery of experimental techniques and approaches in genetics and molecular biology.
- Undergraduate Molecular Genetics minors acquire a basic mastery of data analysis and statistical approaches used in genetics.

Assessment

Assessment plan includes student learning goals, how those goals are evaluated, and how the information collected is used to improve student learning. An assessment plan is required for undergraduate majors and degrees. Graduate and professional degree programs are encouraged to complete this now, but will not be required to do so until 2012.

Is this a degree program (undergraduate, graduate, or professional) or major proposal? No

Program Specializations/Sub-Plans

If you do not specify a program specialization/sub-plan it will be assumed you are submitting this program for all program specializations/sub-plans.

Pre-Major

Does this Program have a Pre-Major? No

Attachments

- MolecularGeneticsMinor.pdf

(Program Proposal. Owner: Shannon,Laurel Jean)

Comments

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Vaessin,Harald Emil Friedrich	01/11/2011 04:06 PM	Submitted for Approval
Approved	Vaessin,Harald Emil Friedrich	01/11/2011 04:07 PM	Unit Approval
Pending Approval	Andereck,Claude David	01/11/2011 04:07 PM	College Approval

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To: Office of Academic Affairs

From: Anita Hopper, Chair, Department of Molecular Genetics

Anita K Hopper

Mark Seeger, Associate Chair, Department of Molecular Genetics

Mark A. Seeger

Date: January 10, 2011

Re: Semester Program Proposal for Undergraduate Molecular Genetics Major

The Department of Molecular Genetics has the following programs that will be converted from quarters to semesters:

1) Undergraduate Molecular Genetics Major (BS)
2) Undergraduate Molecular Genetics Major with a Specialization in Plant Cellular and Molecular Biology (BS)
3) Undergraduate Molecular Genetics Minor
4) Undergraduate Plant Cellular and Molecular Biology Minor
5) Molecular Genetics MS
6) Molecular Genetics PhD

The subject of this proposal is the undergraduate Molecular Genetics Minor.

The Molecular Genetics Curriculum Committee and other subsets of Molecular Genetics and Plant Cellular and Molecular Biology (PCMB) faculty have been working on semester conversion for the past year. This process has included a critical reexamination of the Molecular Genetics Major and Minor, focusing on the core course sequence. In addition, we have created a new Plant Cellular and Molecular Biology Specialization within the Molecular Genetics Major that will meet the needs of undergraduates desiring a plant biology focus to their major. With the imminent merger of the Departments of Molecular Genetics and PCMB, the PCMB Undergraduate Major will become unavailable to new students starting Autumn 2012.

The contents of this proposal have been discussed at multiple faculty meetings during Spring Quarter 2010 and extending into Autumn Quarter 2010. Proposed changes were presented to Molecular Genetics undergraduates at the first Autumn Meeting of the Molecular Genetics Undergraduate Student Organization where strong support for the changes outlined in this proposal was voiced. Since Molecular Genetics and PCMB graduate students have representation at departmental faculty meeting, they've had a clear opportunity to contribute to this proposal. The contents of the proposal were approved by unanimous vote (21-0) of the Molecular Genetics and PCMB faculty at the November 2010 faculty meeting. Transition plans are provided as a component of this proposal. The department has adequate resources to meet

the increased advising that is anticipated throughout the semester conversion process. Molecular Genetics Majors are advised by three faculty members: Drs. Fisk and Simcox advise all undergraduates in the Honors Program, and Dr. Booton advises all other undergraduates. Total number of majors fluctuates between 250 and 300 students.

The Molecular Genetics Minor
We have made a number of changes to the Molecular Genetics Minor. We have emphasized flexibility in the minor to help ensure that students who want to expand their undergraduate experience can do so without undo complexities in planning their undergraduate coursework. Along these lines, we have eliminated the required prerequisites of organic chemistry for the Molecular Genetics Minor. We have also eliminated the biochemistry requirement from the required core courses. These changes should increase access to the minor for many students. Other changes to the core courses reflect changes to the required core course sequence for our majors. These changes are described in greater detail in the following section.

Rationale for Changes to the Undergraduate Molecular Genetics Major Program
There are three changes to the Molecular Genetics Undergraduate Major as we transition to semesters. All of these changes impact our core sequence of classes required for all majors. First, we are merging MG 605 Molecular Genetics I (4 quarter hours) and MG 606 Molecular Genetics II (4 quarter hours) into a single class, MG 5606 Molecular Genetics (4 semester hours). Traditionally, most students have taken their first MG classes starting Winter Quarter of their junior year. In semesters students will take their first MG class their sophomore year. This will allow students to complete the core sequence their junior year and free up their senior year for upper level electives within the major. This change is a significant improvement to our major and strongly endorsed by our undergraduates. To keep MG 5606 as a four-semester hour course we are moving some content to MG 5607 Cell Biology (3 semester hours) and MG 5608 Genes and Development (3 semester hours). The quarter system counterparts, MG 607 and MG 608, were both three quarter hour classes. The second change is the addition of MG 5640 Evolutionary Genetics (3 semester hours) as a required core course for Molecular Genetics Majors. We feel the increased exposure to population and quantitative genetics is important for our majors. The relatively limited exposure to topics in population and quantitative genetics that our students previously had in MG 605 will be moved to MG 5640 and significantly expanded. The third change is the creation of two Embedded Honors Courses, MG 5607E and MG 5608E. Both of these classes will include an additional one-hour, faculty-directed recitation section that will delve deeper into lecture topics through the use of additional primary literature research articles. In the past we have offered a stand-alone honors version of MG 607. The staffing of a stand-alone honors course has proven problematic as the enrollments in the majority of our classes continues to increase substantially.

Transition Policy
Students who begin their degree under quarters will not be penalized as we move to semesters. Our major and minor are not dependent upon specific sequences of courses. With the exception of the merging of MG 605 and MG 606 into MG 5606, most courses will continue to exist with similar content. Essentially all students take MG 605 (offered in Winter Quarter) and MG 606 (offered in Spring Quarter) in consecutive quarters, so the students who have completed only one of these courses will be quite limited in number (past experience suggests this will be less than 5 students). These students will be advised on an individual basis to determine the best course of action with specific consideration to their performance in the course and at the same time minimizing any delay in their progress to degree completion. For students who fail to complete MG606 an individual study plan will be developed tailored to the specific needs of the student. This will include utilization of MG 5193 Individual Studies to substitute for MG 606.

We will provide quarterly updates to all of our undergraduate majors via email in the year preceding the semester conversion. These emails will communicate the importance of ensuring that major prerequisite course sequences in chemistry, math, and physics be completed to ensure a smooth transition to semesters. We do not foresee any significant difficulties in the transition process that are unique to our undergraduate major or minor programs.

Course Listing and Curriculum Map for the Molecular Genetics Minor

Required prerequisites for the minor

(do not count towards hours in the major)

Requirements	Semester Course Number	Course Title	Semester Credits		Quarter Equivalent Course Number	Quarter Credits	Notes	Program Goals
Biology	Bio 1113	Intro Biology	4		Bio 113	5	Expanded content; Bio 1113H also accepted	1, 2, 3, 4, 5
	Bio 1114	Intro Biology	4		Bio 114	5	Expanded content; Bio 1114H also accepted	1, 2, 3, 4, 5
Chemistry	Chem 1210, 1220	General Chemistry I & II	10		Chem 121, 122, 123	15	Simple conversion; Chem 1610, 1620 or Chem 1910H, 1920H also accepted	1

Core minor requirements

Semester Course Number	Course Title	Semester Credits	Quarter Equivalent Course Number	Quarter Credits	Notes	Program Goals
Mol Gen 4500	General Genetics	3	Mol Gen 500	5	Simple conversion; embedded honor's version of Mol Gen 4500 also accepted	1*, 2*, 3*, 4*, 5*
----OR----	-----OR--------	---OR---	--------OR-------	--OR--	----------OR----------	-----OR----
Mol Gen 5606	Molecular Genetics	4	Mol Gen 605, 606	8	Merged content of MG605 and 606; some content moved to MG 5608 (eukaryotic gene regulation); population and quantitative genetics removed and met by addition of MG 5640 to the core	1*, 2*, 3*, 4*, 5*
At least two of the following three classes are required for the minor.						
Mol Gen 5607	Cell Biology	3	Mol Gen 607 and PCMB 648	3 4	Merged content of Mol Gen 607 and PCMB 648 with elimination of redundant subject matter	1*, 2*, 3*, 4*, 5*
-----OR------	------OR------	----OR-----			----------OR----------	
Mol Gen 5607E	Honors Cell Biology	4			Embedded Honor's version includes an extra 55-min recitation with instructor	

Mol Gen 5608 -----OR------ Mol Gen 5608E	Genes and Development -----OR------ Honors Genes and Development	3 ----OR----- 4		Mol Gen 608	3	Enhanced content and addition of material previously taught in MG 605, 606 ----------OR---------- Embedded Honor's version includes an extra 55-min recitation with instructor	1*, 2*, 3*, 4*, 5*
Mol Gen 5640	Genetic Basis of Evolution	3		Mol Gen 640	5	This course was previously not part of the core	1*, 2*, 3*, 4*, 5*

Elective Courses in Molecular Genetics that count towards the minor

(core courses plus electives must total at least 14 semester credit hours)

Semester Course Number	Course Title	Sem Credits		Quarter Equivalent Course Number	Quarter Credits	Notes	Program Goals
Mol Gen 2220H	Intro to Molecular Life Sciences: Research Opportunities and Career Options	1		Mol Gen 220H	1	Expanded content.	1, 2
Mol Gen 4503	Molecular	1		Mol Gen 503	2	Same content	6**, 7**,

	Genetics Writing Project						8**
Mol Gen 4591S	DNA Fingerprinting Workshops in Columbus Public Schools	1		Mol Gen 591	2	Same content	6**, 7**
Mol Gen 5193	Individual Studies	1-3		Mol Gen 693 and PCMB 693	1-10	Repeatable; not more than 3 semester hours can count towards a major	6**, 7**, 8**
Mol Gen 5194	Group Studies	1-3		PCMB 694	1-5	Repeatable; not more than 3 semester hours can count towards a major	2**, 8**
Mol Gen 5601 -----OR------ Mol Gen 5602	Molecular Genetics Lab -------OR-------- Cell and Developmental Biology Lab	3-4 -----OR-- -- 3-4		Mol Gen 601 ----------OR---------- Mol Gen 602	5 ---OR--- 5	Enhanced content for both Mol Gen 5601 or 5602; 3 semester credit hour version limited to May-mester or summer offerings	2*, 3*, 4*, 5*, 6*, 7*
Mol Gen 5632	Insect Molecular Genetics	2		Mol Gen 632	3	Same content	2**,8*
Mol Gen 5650	Analysis and Interpretation of Biological Data	3		Mol Gen 650	5	Same content	3**, 5**
Mol Gen 5998 (or 5998H)	Undergraduate Research in Molecular Genetics	1-5		Mol Gen 699	1-18	Repeatable; not more than 4 semester credit hours can count towards the minor	3**, 4**, 5**, 6**, 7**, 8**
Alternative electives can be accepted for the Molecular Genetics Minor with approval from the advisor.							

Elective courses outside the department that count towards the minor

Semester Course Number	Course Title	Semester Credits		Quarter Equivalent Course Number	Quarter Credits	Notes	Program Goals
Micro 5081	Microbial Genetics	3		Micro 581.01	3	Enhanced content	1*, 2*, 3*, 4*, 5*
Micro 5161H	Bioinformatics and Molecular Microbiology	3		Micro 610H	5	Direct conversion	2**, 3**, 4**, 8**

1. Undergraduate Molecular Genetics majors acquire a basic mastery of fundamental concepts of biology, chemistry, mathematics, physics, and the scientific method.

2. Undergraduate Molecular Genetics majors acquire a basic mastery of fundamental areas of molecular genetics, including transmission genetics, the central dogma of molecular biology, regulation of gene expression, quantitative and population genetics, genomics, recombinant DNA and biotechnology, and cell and developmental biology.

3. Undergraduate Molecular Genetics majors develop analytical and problem solving skills in areas of genetics and molecular biology.

4. Undergraduate Molecular Genetics majors acquire a basic mastery of experimental techniques and approaches in genetics and molecular biology.

5. Undergraduate Molecular Genetics majors acquire a basic mastery of data analysis and statistical approaches used in genetics.

6. Undergraduate Molecular Genetics majors effectively communicate their understanding of genetics and molecular biology both orally and in writing.

7. Undergraduates majors participate in academic research and/or outreach activities that are consistent with their interests and postgraduate plans.

8. Undergraduate majors acquire expertise relevant to their chosen area of specialization.

Program learning goals with no asterisk = beginner's level; * = intermediate level; ** = advanced level

Molecular Genetics Undergraduate Minor

Advising Form - Semester System

Name: _____ Semester of Graduation:_____

Required prerequisites

- ❑ Biology 1113 (or 1113H) and Biology 1114 (or 1114H)
- ❑ Chemistry 1210 and 1220

Required Core Courses

One of the following courses:

- ❑ Mol Gen 4500 (3) or Mol Gen 4500E (4)
- ❑ Mol Gen 5606 (4)

At least two of the following courses:

- ❑ Mol Gen 5607 (3) or 5607E (4)
- ❑ Mol Gen 5608 (3) or 5608E (4)
- ❑ Mol Gen 5640 (3)

Elective Courses

(Core plus electives must total at least 14 semester credit hours)

- ❑ Mol Gen 2220H (1)
- ❑ Mol Gen 4503 (1)
- ❑ Mol Gen 4591S (1)
- ❑ Mol Gen 5193 (1-3)
- ❑ Mol Gen 5194 (1-3)
- ❑ Mol Gen 5601 or 5602 (3-4)
- ❑ Mol Gen 5632 (2)
- ❑ Mol Gen 5650 (3)
- ❑ Mol Gen 5998 or 5998H (1-5)
- ❑ Micro 5081 (3)
- ❑ Micro 5161H (3)
- ❑ Alternative elective approved by MG advisor: _____

Advisor Name (Printed):_____ Advisor Signature:_____

Date:_____

Molecular Genetics Undergraduate Minor

Advising Form - Quarter System

Name: _____ Quarter of Graduation:_____

Required prerequisites

- ❑ Bio 113 (or Bio 115H) and Bio 114 (or Bio 116H)
- ❑ Chemistry 121, 122, and 123
- ❑ Chemistry 251, 252

Required Core Courses

- ❑ Mol Gen 605 (4)
- ❑ Mol Gen 606 (4)
- ❑ Mol Gen 607 (3)
- ❑ Mol Gen 608 (3)
- ❑ Mol Gen 601 (5) or 602 (5)
- ❑ Biochem 511 (5)

Advisor Name (Printed):_____ Advisor Signature:_____

Date:_____