

<b>Fiscal Unit/Academic Org</b>	Molecular Genetics - D0340
<b>Administering College/Academic Group</b>	Biological Sciences
<b>Co-administering College/Academic Group</b>	
<b>Semester Conversion Designation</b>	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)
<b>Current Program/Plan Name</b>	Molecular Genetics Minor
<b>Proposed Program/Plan Name</b>	Molecular Genetics Minor
<b>Program/Plan Code Abbreviation</b>	MOLGEN-MN
<b>Current Degree Title</b>	

## 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	8	4.7
	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	6	2.7
Required prerequisite credit hours not included above	Minimum	33	22.0	18	4.0
	Maximum	33	22.0	18	4.0

**Explain any change in credit hours if the difference is more than 4 semester credit hours between the values listed in columns B and C for any row in the above table**

The change in the minimum "Required credit hours offered by the unit" row is the result of a higher degree of flexibility for students to complete the Molecular Genetics minor. Under the quarter system 6 quarter courses are required core courses, with no electives. After semester conversion, the number of required core courses drops to three, while the remaining credit hours (for a total of at least 14 semester credit hours) will come from electives.

## 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.

<b>Program Learning Goals</b>	<ul style="list-style-type: none"> <li>• Undergraduate Molecular Genetics (MG) minors acquire a basic mastery of fundamental concepts of biology, chemistry, mathematics, physics, and the scientific method.</li> <li>• 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.</li> <li>• Undergraduate Molecular Genetics minors develop analytical and problem solving skills in areas of genetics and molecular biology.</li> <li>• Undergraduate Molecular Genetics minors acquire a basic mastery of experimental techniques and approaches in genetics and molecular biology.</li> <li>• Undergraduate Molecular Genetics minors acquire a basic mastery of data analysis and statistical approaches used in genetics.</li> </ul>
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## 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

- CCI Subcommittee Chair Letter MolecularGeneticsMinor.doc: CCI Subcommittee Chair Letter  
*(Other Supporting Documentation. Owner: Vankeerbergen, Bernadette Chantal)*
- MG Minor Proposal-rev.pdf  
*(Program Proposal. Owner: Shannon, Laurel Jean)*
- MolGen minor cover letter.doc: NMS Division of Arts and Sciences  
*(Letter from the College to OAA. Owner: Andereck, Claude David)*

## Comments

- 5606 is left in some places (description of the minor and transition policy). Replace with 4606. *(by Vankeerbergen, Bernadette Chantal on 05/20/2011 12:11 PM)*

**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
Revision Requested	Andereck, Claude David	01/19/2011 03:11 PM	College Approval
Submitted	Shannon, Laurel Jean	01/21/2011 05:38 PM	Submitted for Approval
Approved	Vaessin, Harald Emil Friedrich	01/21/2011 05:47 PM	Unit Approval
Revision Requested	Andereck, Claude David	01/27/2011 04:11 PM	College Approval
Submitted	Shannon, Laurel Jean	01/29/2011 02:01 PM	Submitted for Approval
Approved	Vaessin, Harald Emil Friedrich	01/29/2011 06:54 PM	Unit Approval
Revision Requested	Andereck, Claude David	01/31/2011 11:07 AM	College Approval
Submitted	Shannon, Laurel Jean	01/31/2011 12:41 PM	Submitted for Approval
Approved	Vaessin, Harald Emil Friedrich	01/31/2011 01:01 PM	Unit Approval
Approved	Andereck, Claude David	02/01/2011 09:48 AM	College Approval
Revision Requested	Vankeerbergen, Bernadette Chantal	02/10/2011 10:29 AM	ASCCAO Approval
Submitted	Shannon, Laurel Jean	05/02/2011 05:18 PM	Submitted for Approval
Approved	Vaessin, Harald Emil Friedrich	05/02/2011 09:03 PM	Unit Approval
Approved	Andereck, Claude David	05/10/2011 10:40 AM	College Approval
Revision Requested	Vankeerbergen, Bernadette Chantal	05/20/2011 12:12 PM	ASCCAO Approval
Submitted	Shannon, Laurel Jean	05/20/2011 12:37 PM	Submitted for Approval
Approved	Vaessin, Harald Emil Friedrich	05/20/2011 12:40 PM	Unit Approval
Approved	Andereck, Claude David	05/23/2011 03:35 PM	College Approval
Pending Approval	Hanlin, Deborah Kay Vankeerbergen, Bernadette Chantal Meyers, Catherine Anne Jenkins, Mary Ellen Bigler Nolen, Dawn	05/23/2011 03:35 PM	ASCCAO Approval



**Department of English**

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To: Larry Krissek, Chair, Committee on Curriculum and Instruction (CCI)  
From: James Fredal, Chair, CCI Social, Behavioral, Biological, Mathematical and Physical  
Sciences Subcommittee  
Re: Semester Conversion Proposal for the Molecular Genetics Minor

Date: May 18<sup>th</sup>, 2011

Larry:

As you may have guessed, the Sciences subcommittee met to discuss the semester conversion proposal for the Molecular Genetics minor and approved it unanimously. It has been affected (not effected) by many of the same changes that affected the MG BS degree, including the merger of MG 605 and 606 (Molecular Genetics I and II) into one semester course, MG 4506 (this is listed still as 5606 in several places in the proposal). For the minor, MG 4500 will also be an acceptable substitute. Minors will now also be able to take MG 5640, Molecular Genetics, as part of the core sequence, along with 5607 (Cell Biology) and 5608 (Genes and Development). Finally, the two embedded Honors courses, 5607E and 5608E will be available to minors as well.

A few changes are also specific to the minor, generally intended to make the minor more flexible and less onerous for students to complete. Organic chemistry has been eliminated as a prerequisite, and biochemistry has been eliminated from the required core. Whereas under quarters, the minor was made up of seven prerequisites and a required core of six classes, under semesters the minor will be made up of only four prerequisites and three required classes. The remainder of the minor will be filled with electives.

As I mentioned, there are a few places in the document where MG 4606 is referred to as 5606 (its original number). All the rest of our suggested changes and corrections were addressed, so we figured it was ready to go forward.

Thanks

Jim Fredal

cc: Bernadette Vankeerbergen

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May 23, 2011

Larry Krissek  
Chair, Arts and Sciences CCI

Dear Larry:

It is a pleasure to forward to you the proposal for the undergraduate minor in Molecular Genetics under semesters. The minor has been modified from its present quarter version through some small course restructuring and a change in the electives, as well as by eliminating organic chemistry as a required prerequisite and biochemistry from the core requirements. The latter change in particular should make the minor program more accessible and flexible for students through reducing the total credit hours necessary.

Beyond my own review of the documents, the proposal has been discussed with colleagues from other NMS units at a meeting on January 19, 2011. Feedback from the discussions, as well as from the CCI Sciences Subcommittee and the CCI itself, has been incorporated in the proposal.

If you have any questions, I would be happy to address them.

Sincerely,



David Andereck  
Professor of Physics  
Associate Dean of Natural and Mathematical Sciences, College of Arts and Sciences



**Department of Molecular Genetics**

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To: Office of Academic Affairs

From: Anita Hopper, Chair, Department of Molecular Genetics

Handwritten signature of Anita K. Hopper in blue ink.

Mark Seeger, Associate Chair, Department of Molecular Genetics

Handwritten signature of Mark A. Seeger in blue ink.

Date: January 31, 2011

Re: Semester Program Proposal for Undergraduate Molecular Genetics Minor

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 meetings, 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. We no longer require biochemistry or organic chemistry as prerequisites for any of the Molecular Genetics core courses. While we continue to require both organic chemistry and biochemistry for completion of the Molecular Genetics Major, we do not feel that it is essential for the minor, especially given that neither are prerequisites for the courses that comprise the Molecular Genetics Minor. 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. First, we are merging MG 605 Molecular Genetics I (4 quarter credit hours) and MG 606 Molecular Genetics II (4 quarter credit hours) into a single class, MG 4606 Molecular Genetics (4 semester credit hours). MG 4500 is an alternative to MG 4606 for students completing the MG Minor and the conversion of this course from quarters to semesters is a simple conversion without changes in content. To keep MG 4606 as a four-semester hour course we are moving some content to MG 5607 Cell Biology (3 semester credit hours) and MG 5608 Genes and Development (3 semester credit hours). The quarter system counterparts, MG 607 and MG 608, were both three quarter credit hour classes. Second, MG 5640 Evolutionary Genetics (2 semester credit hours) has been added as a choice to the core course sequence along with MG 5607 Cell Biology and MG 5608 Genes and Development. 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 4606, 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 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 minors via email in the year preceding the semester conversion. 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 minor)

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	1, 2, 3, 4, 5
	Bio 1114	Intro Biology	4	Bio 114	5	Expanded content	1, 2, 3, 4, 5
Chemistry	Chem 1210, 1220	General Chemistry I & II	10	Chem 121, 122, 123	15	Simple conversion	1

Honors or more advanced versions of these prerequisite courses can be substituted.

### 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---		
Mol Gen	General					

4500E	Genetics	4	Mol Gen 500H	6	-----OR----- 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	-----OR----- 1*, 2*, 3*, 4*, 5*
-----OR----- Mol Gen 4606	-----OR----- Molecular Genetics	-----OR--- 4	-----OR----- Mol Gen 605, 606	--OR-- 8		

**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----- Mol Gen 5607E	-----OR----- Honors Cell Biology	-----OR----- 4			-----OR----- Embedded Honor's version includes an extra 55-min recitation with instructor	
Mol Gen 5608	Genes and Development	3	Mol Gen 608	3	Enhanced content and addition of material previously taught in MG 605, 606	1*, 2*, 3*, 4*, 5*
-----OR----- Mol Gen 5608E	-----OR----- Honors Genes and Development	-----OR----- 4			-----OR----- Embedded Honor's version includes an extra 55-min recitation with instructor	

Mol Gen 5640	Genetic Basis of Evolution	2	Mol Gen 640	5	This course was previously not part of the core; reduction in content	1*, 2*, 3*, 4*, 5*
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**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 Genetics Writing Project	1	Mol Gen 503	2	Same content	2**, 4**
Mol Gen 4591S	DNA Fingerprinting Workshops in Columbus Public Schools	1	Mol Gen 591	2	Same content	2**, 4**

Mol Gen 4998 (or 4998H)	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**
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 minor	2**, 4**
Mol Gen 5194	Group Studies	1-3	PCMB 694	1-5	Repeatable; not more than 3 semester hours can count towards a minor	2**
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*
Mol Gen 5632	Insect Molecular Genetics	2	Mol Gen 632	3	Same content	2**
Mol Gen 5650	Analysis and Interpretation of Biological Data	3	Mol Gen 650	5	Same content	3**, 5**
<b>Alternative electives can be accepted for the Molecular Genetics Minor with approval from the advisor.</b>						

**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**

1. Undergraduate Molecular Genetics minors acquire a basic mastery of fundamental concepts of biology, chemistry, mathematics, physics, and the scientific method.
2. Undergraduate Molecular Genetics minors 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 minors develop analytical and problem solving skills in areas of genetics and molecular biology.
4. Undergraduate Molecular Genetics minors acquire a basic mastery of experimental techniques and approaches in genetics and molecular biology.
5. Undergraduate Molecular Genetics minors acquire a basic mastery of data analysis and statistical approaches used in genetics.

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

# 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: \_\_\_\_\_

# Molecular Genetics Undergraduate Minor

## Advising Form - Semester System

Name: \_\_\_\_\_

Semester of Graduation: \_\_\_\_\_

### Required prerequisites

Biology 1113 and Biology 1114

Chemistry 1210 and 1220

Honors or more advanced versions of these prerequisite courses can be substituted.

### Required Core Courses

#### One of the following courses:

Mol Gen 4500 (3) or Mol Gen 4500E (4)

Mol Gen 4606 (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 (2)

### Elective Courses

**(Core plus electives must total at least 14 semester credit hours; no more than 5 semester credit hours can be graded S/U and count towards the Minor)**

Mol Gen 2220H (1)

Mol Gen 5601 or 5602 (3-4)

Mol Gen 4503 (1)

Mol Gen 5632 (2)

Mol Gen 4591S (1)

Mol Gen 5650 (3)

Mol Gen 4998 or 4998H (1-5)

Micro 5081 (3)

Mol Gen 5193 (1-3)

Micro 5161H (3)

Mol Gen 5194 (1-3)

Alternative elective approved by MG advisor: \_\_\_\_\_

Advisor Name (Printed): \_\_\_\_\_ Advisor Signature: \_\_\_\_\_

Date: \_\_\_\_\_