

Status: PENDING

PROGRAM REQUEST
Molecular, Cellular, and Developmental
Biology - MS

Last Updated: Myers, Dena Elizabeth
08/04/2011

Fiscal Unit/Academic Org	Biological Sciences Admin - D0300
Administering College/Academic Group	Pharmacy
Co-administering College/Academic Group	Food, Agric & Environ Science Veterinary Medicine The College of Medicine Arts And Sciences Pharmacy
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 Cellular and Developmental Biology
Proposed Program/Plan Name	Molecular, Cellular, and Developmental Biology - MS
Program/Plan Code Abbreviation	MCEBIO-MS
Current Degree Title	Master of Science

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		45	30.0	30	0.0
Required credit hours offered by the unit	Minimum	10	6.7	8	1.3
	Maximum	20	13.3	15	1.7
Required credit hours offered outside of the unit	Minimum	25	16.7	15	1.7
	Maximum	35	23.3	22	1.3
Required prerequisite credit hours not included above	Minimum	0	0.0	0	0.0
	Maximum	0	0.0	0	0.0

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 •

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? Yes

Does the degree program or major have an assessment plan on file with the university Office of Academic Affairs? 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.

Status: PENDING

PROGRAM REQUEST
Molecular, Cellular, and Developmental
Biology - MS

Last Updated: Myers,Dena Elizabeth
08/04/2011

Pre-Major

Does this Program have a Pre-Major? No

Attachments

- MCDB MS Program 072811.doc: MCDB MS Program Proposal
(Program Proposal. Owner: Vaessin,Harald Emil Friedrich)
- MCDB MS cover letter.doc: NMS Division of Arts and Sciences cover letter
(Letter from the College to OAA. Owner: Andereck,Claude David)

Comments

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Vaessin,Harald Emil Friedrich	08/01/2011 01:48 PM	Submitted for Approval
Approved	Breitenberger,Caroline Anna	08/01/2011 05:17 PM	Unit Approval
Approved	Andereck,Claude David	08/04/2011 11:36 AM	College Approval
Approved	Myers,Dena Elizabeth	08/04/2011 01:26 PM	GradSchool Approval
Pending Approval	Cameron,Erin Marie Soave,Melissa A	08/04/2011 01:26 PM	CAA Approval



College of Arts and Sciences

186 University Hall
230 North Oval Mall
Columbus, OH 43210

Phone (614) 292-8908
Fax (614) 247-7498

August 4, 2011

Dena Myers
Graduate School
250 University Hall
230 North Oval Mall
Campus

Dear Dena:

It is a pleasure to forward to you for your consideration the proposal for the Masters program in Molecular, Cellular, and Developmental Biology. This interdisciplinary graduate program was reviewed by colleagues from NMS units at meetings on July 22, 2011. Feedback from these discussions has been incorporated in the proposal.

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

Sincerely,

A handwritten signature in black ink, appearing to read "David Andereck".

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



Program in Molecular, Cellular, and Developmental Biology

Dr. David M. Bisaro
Professor and Director
201 Rightmire Hall
1060 Carmack Road
Columbus, OH 43210

Phone (614) 292-3281
Fax (614) 292-5379
E-mail bisaro.1@osu.edu

To: Office of Academic Affairs

From: David Bisaro, Director, MCDB Program
Professor, Dept. of Molecular Genetics

Date: July 28, 2011

Re: Semester Program Proposal for the MCDB MS Program

The Interdisciplinary Graduate Program (IGP) in Molecular, Cellular, and Developmental Biology (MCDB) currently consists of ~130 PhD students and ~170 faculty representing 25 departments in six colleges. Program funding is provided by the Council of Life Sciences Deans. Currently, the Lead Dean is Dr. Robert Brueggemeier (College of Pharmacy), who has direct oversight of MCDB and related IGPs, including the Ohio State Biochemistry Program (OSBP), the Biophysics Program, and the Neuroscience Program.

The MCDB program was most recently reviewed by the Graduate School's Life Sciences Task Force (2008/09), and an external review initiated by the Council of Life Sciences Deans was carried out in 2004. No significant curricular deficiencies were noted in these reviews.

MCDB admits only PhD students. However, the program offers the MS degree for students opting to end graduate studies, as a means of acknowledging their advanced study and research.

MCDB will convert the following from quarter to semester format:

- 1) MS in MCDB
- 2) PhD in MCDB

This proposal concerns the MS program. The MCDB Graduate Studies Committee (GSC) and subsets thereof have been working on aspects of semester conversion for the past year. The curriculum described in this proposal was prepared by the GSC (David M. Bisaro, Chair, Maki Asano, Christopher Bartlett, Dawn Chandler, Chen Gu, Tsonwin Hai, Heithem El-Hodiri, and Harald Vaessin) and unanimously approved during the Summer Quarter, 2010.

The MCDB core curriculum is drawn from courses taught by the departments of Molecular Genetics (Mol Gen), Biochemistry (Biochem), and Molecular and Cellular Biochemistry (MCB). The Director of the MCDB program was invited and contributed to departmental discussions that directly concerned the MCDB core, and the program is in agreement with the semester

conversion plans for these courses.

The only courses offered by MCDB are: 1) First Year Student Orientation (MCDB/OSBP 7600, 1 semester credit), which contains an expanded research ethics module as well as introductory material for new students; 2) Seminar in MCDB (MCDB 7890, 1 semester credit), which includes presentations by students, faculty, and prestigious external speakers; 3) MCDB Seminar Presentation (MCDB 7891, 2 semester credits), as MCDB 7890, except used in those terms when the student is presenting. 4) Individual Studies (MCDB 6693, 1 to 3 semester credits), readings or special assignments in selected advanced topics; and 5) Laboratory Rotations (MCDB 7780, 1 to 6 semester credits). After completing three first year lab rotations, students register for Dissertation Research using their advisors departmental registration number (X 8999).

Program Rationale

MCDB graduate study emphasizes an integrative approach to the discipline, encompassing the molecular, cellular, and organismal levels of organization. Students undergo training in a core of courses in molecular biology, cell biology, developmental biology and biochemistry. The main goal of the proposed plan is to provide a flexible curriculum that imparts basic core knowledge while allowing appropriate elective courses and maximum opportunity to pursue research.

A typical graduate program begins with a course-intensive first year of study, followed by some additional coursework in the second year. The following courses will constitute the core: Mol Gen 5701 (DNA Transactions and Gene Regulation, 4 semester credits), Biochem/MCB 6761 (Proteins and Macromolecular Structures, 3 semester credits), Mol Gen 5705 (Advances in Cell Biology, 2 semester credits), Mol Gen 5715 (Developmental Genetics, 2 semester credits), and MCDB 7600 (First Year Student Orientation, 1 semester credit).

The most consequential changes to the core due to semester conversion include the merging of Mol Gen 701 (DNA Transactions) and Biochem 702 (Regulation of Gene Expression) into a new four-semester credit hour course (Mol Gen 5701, DNA Transactions and Gene Regulation), and the merger of Biochem/MCB 761 (Proteins) and Biochem 766 (Nucleic Acids) into a three-semester credit hour course (Biochem/MCB 6761, Proteins and Macromolecular Structures). These changes will reduce the number of credit hours in the core sequence from 18-quarter credit hours to 12-semester credit hours. Additional GSC-approved elective courses may be chosen at the 5000-level or above, with input and approval of the dissertation advisor for those taken after the first year. Electives are flexible so that the individual needs and interests of each student can be met, and additional courses may be added with advisor and GSC approval.

Transition Policy

No student will be negatively impacted or have their degree progress impeded by the quarter to semester conversion process. Our curriculum does not include multi-course sequences, and students will complete core courses during the first year. Second year courses will mostly consist of electives. No significant changes in course offerings are anticipated with the start of semesters. Finally, as student advising is already done on an individual basis, no additional personnel are required to advise students during the transition.

A potential issue created by merged core courses will be handled as follows:

Mol Gen 5701: Mol Gen 701 and Biochem 702 are currently taken in consecutive quarters during the first year, so as a rule students will not be affected by their merger into Mol Gen 5701. However, students who do not meet requirements for either Mol Gen 701 or Biochem 702 the year prior to semester conversion will register for 3 credits of MCDB 5693 (Individual Studies) in the following year. This will allow further study and examination of the necessary material.

The MCDB MS Program- Semesters

In the context of the MCDB Program, the Master's degree constitutes a minor component of graduate training. Except in unusual circumstances, applications specifically for MS degrees will not be approved for admission. The degree as awarded by MCDB usually provides an exit route for those students opting to end graduate studies in the program following a decision not to pursue a doctoral degree, and acknowledges their advanced study and research.

There are two routes to the MS degree. Both conform to Graduate School requirements, including total credit hour requirements, minimum GPA of 3.0, and the format of the final Masters exam (including both written and oral components).

Common to Thesis (Plan A) and Non-Thesis (Plan B)

1. A minimum of 12 semester credits at the 5000 or 6000 level, excluding credit for seminar courses (MCDB 7890, MCDB 7891) and research (MCDB 7780, X 8999).

Required courses include (core plus first year student orientation):

Mol Gen 5701 - DNA Transactions and Gene Regulation (4 credits)

Biochem/MCB 6761 - Proteins and Macromolecular Structures (3 credits)

Mol Gen 5705 - Advances in Cell Biology (2 credits)

Mol Gen 5715 – Developmental Genetics (2 credits)

MCDB/OSBP 7600 – First Year Student Orientation (1 credit)

2. A minimum of 8 semester credit hours of research (either MCDB 7780, X 8999, or X 7999).

3. Elective courses at the 5000 level or above may be included but are not required.

Elective courses may be used to fulfill the requirement of 30 semester credit hours.

These will be selected from courses offered by the Departments of Biochemistry; Microbiology; Molecular and Cellular Biochemistry; Molecular Genetics; Molecular Virology, Immunology, and Medical Genetics; Neuroscience; Pathology; Pharmacy; Plant Pathology; Statistics; and Veterinary Biosciences. The elective list will be both extensive and flexible so that the individual needs and interests of each student can be met. Other electives may be substituted with the permission of the advisor and the GSC.

4. A minimum of 30 total semester credit hours with a GPA of 3.0.

Unique to Thesis (Plan A)

5. Satisfactory completion of a written thesis that is approved by the students committee.

6. Satisfactory completion of a final oral exam.

Unique to Non-Thesis (Plan B)

5. Satisfactory completion of a final written exam/report.

6. Satisfactory completion of a final oral exam.

Successful completion of the PhD candidacy exam can be used to meet requirements 5 and 6 for the non-thesis Masters degree.

Quarter-Based Requirements for the MCDB MS

Common to Thesis (Plan A) and Non-Thesis (Plan B)

1. A minimum of 19 semester credits at the 5000 or 6000 level, excluding credit for seminar courses (MCDB 800, MCDB 890) and research (MCDB 693, X 999).

Required courses include (core plus first year student orientation):

Mol Gen 701 - DNA Transactions (3 credits)

Biochem 702 - Regulation of Gene Expression (3 credits)

Mol Gen 705 - Advances in Cell Biology (3 credits)

Mol Gen 715 - Eukaryotic Developmental Genetics (3 credits)

OSBP 760 - First Year Student Orientation (1 credit)

Biochemistry: Two courses required, one must be from list one (i). (6 credits)

i) Courses focused on proteins:

Biochemistry 761. *Advanced Biochemistry: Proteins.*

Biochemistry 770. *Protein Engineering.*

Molecular and Cellular Biochemistry 762. *Advanced Biochemistry: Enzymes.*

Molecular and Cellular Biochemistry 824. *Enzymology.*

ii) Other biochemistry courses:

Biochemistry 763. *Advanced Biochemistry: Membranes and Bioenergetics.*

Biochemistry 765. *Advanced Biochemistry: Physical Biochemistry.*

Biochemistry 766. *Advanced Biochemistry: Nucleic Acids.*

Molecular and Cellular Biochemistry 764. *Advanced Biochemistry: Integration of Metabolism.*

Molecular and Cellular Biochemistry 823. *Control of Cell Growth and Proliferation.*

Plant Cellular and Molecular Biology 735. *Plant Biochemistry I.*

Plant Cellular and Molecular Biology 736. *Plant Biochemistry II.*

2. Research is expected (either MCDB 693, or X 999), but no minimum is currently stated.

3. Elective courses at the 500 level or above may be included but are not required.

These are selected from courses offered by the Departments of Biochemistry; Microbiology; Molecular and Cellular Biochemistry; Molecular Genetics; Molecular Virology, Immunology, and Medical Genetics; Neuroscience; Pathology; Pharmacy; Plant Pathology; Statistics; and Veterinary Biosciences. The elective list is both extensive and flexible so that the individual needs and interests of each student can be met. Other electives may be substituted with the permission of the advisor and the GSC.

4. A minimum of 35 total quarter credit hours with a GPA of 3.0.

Unique to Thesis (Plan A)

5. Satisfactory completion of a written thesis that is approved by the students committee.

6. Satisfactory completion of a final oral exam.

Unique to Non-Thesis (Plan B)

5. Satisfactory completion of a final written exam/report.

6. Satisfactory completion of a final oral exam.

Successful completion of the PhD candidacy exam can be used to meet requirements 5 and 6 for the non-thesis Masters degree.

Comparison of Masters degree under quarters and semesters				
Requirements	Plan A (Thesis) Semesters	Plan A (Thesis) Quarters	Plan B (Non-Thesis) Semesters	Plan B (Non-Thesis) Quarters
Coursework	Minimum of 12 semester credit hours of courses at the 5000-7000 level, excluding seminars (MCDB 7890, MCDB 7891), and research (MCDB 7780, or X 8999)	Minimum of 19 quarter credit hours of courses at the 700-800 level, excluding credit for seminars (MCDB 800/890) or research (MCDB 693 or X 999)	Minimum of 12 semester credit hours of courses at the 5000-7000 level, excluding seminars (MCDB 7890, MCDB 7891), and research (MCDB 7780, or X 8999)	Minimum of 19 quarter credit hours of courses at the 700-800 level, excluding credit for seminars (MCDB 800/890) or research (MCDB 693 or X 999)
Research	Minimum of 8* semester credit hours of MCDB 7780 or X 8999 or X7999	MCDB 693 or X 999 credit hours expected, but no minimums currently stated	Minimum of 8* semester credit hours of MCDB 7780 or X 8999 or X7999	MCDB 693 or X 999 credit hours expected, but no minimums currently stated
Elective Credit Hours	Additional coursework at the 5000 level or higher to reach the 30 semester credit hours required for the degree	Minimum of 9 quarter credit hours of elective coursework must be completed at the 600 level or higher	Additional coursework at the 5000 level or higher to reach the 30 semester credit hours required for the degree	Minimum of 9 quarter credit hours of elective coursework must be completed at the 600 level or higher
Thesis	Yes	Yes	No	No
Written Exam	Thesis	Thesis	Yes	Yes
Oral Exam	Yes	Yes	Yes	Yes

* No more than a total of 10 MCDB 7780, X8999, or X7999 credit hours can be counted towards the degree.