

Status: PENDING

PROGRAM REQUEST
Biochemistry

Last Updated: Myers, Dena Elizabeth
06/15/2011

Fiscal Unit/Academic Org	Biochemistry - D0310
Administering College/Academic Group	Arts And Sciences
Co-administering 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	Biochemistry
Proposed Program/Plan Name	Biochemistry
Program/Plan Code Abbreviation	BIOCHEM-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	34	4.0
Required credit hours offered by the unit	Minimum	42	28.0	32	4.0
	Maximum	45	30.0	34	4.0
Required credit hours offered outside of the unit	Minimum	0	0.0	0	0.0
	Maximum	3	2.0	2	0.0
Required prerequisite credit hours not included above	Minimum				
	Maximum				

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 • Graduate Program--Program Learning Goals need not be provided at this time but will be re-evaluated and submitted prior to the 2012 deadline.

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

DIRECT MEASURES (means of assessment that measure performance directly, are authentic and minimize mitigating or intervening factors)

Standardized tests

- Local comprehensive or proficiency examinations

Classroom assignments

- Embedded testing (i.e. specific questions in homework or exams that allow faculty to assess students' attainments of a specific learning goal)
- Other classroom assessment methods (e.g., writing assignments, oral presentations, oral exams)

Evaluation of a body of work produced by the student

- Practicum, internship or research evaluation of student work

Direct assessment methods specifically applicable to graduate programs

- Thesis/dissertation oral defense and/or other oral presentation
- Thesis/dissertation (written document)
- Publications

INDIRECT MEASURES (means of assessment that are related to direct measures but are steps removed from those measures)

Surveys and Interviews

- Student survey
- Student evaluation of instruction

Additional types of indirect evidence

- Job or post-baccalaureate education placement
- Student or alumni honors/recognition achieved
- Curriculum or syllabus review
- Grade review
- Comparison or benchmarking

USE OF DATA (how the program uses or will use the evaluation data to make evidence-based improvements to the program periodically)

- Meet with students directly to discuss their performance
- Analyze and discuss trends with the unit's faculty
- Analyze and report to college/school
- Make improvements in curricular requirements (e.g., add, subtract courses)
- Make improvements in course content
- Make improvements in course delivery and learning activities within courses
- Make improvements in learning facilities, laboratories, and/or equipment
- Periodically confirm that current curriculum and courses are facilitating student attainment of program goals

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

- BiochemistryMS Program Request Proposal Program Attachments REV_3.pdf: Attachments (letter, rationae, advising, etc)
(Program Proposal. Owner: Swenson, Richard Paul)
- Biochemistry MS cover letter.doc: NMS Division of Arts and Sciences cover letter
(Letter from the College to OAA. Owner: Andereck, Claude David)

Comments

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Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Swenson,Richard Paul	01/24/2011 03:36 PM	Submitted for Approval
Approved	Swenson,Richard Paul	01/27/2011 04:53 PM	Unit Approval
Revision Requested	Andereck,Claude David	02/02/2011 03:09 PM	College Approval
Submitted	Swenson,Richard Paul	06/01/2011 01:39 PM	Submitted for Approval
Approved	Swenson,Richard Paul	06/01/2011 01:41 PM	Unit Approval
Revision Requested	Andereck,Claude David	06/08/2011 03:43 PM	College Approval
Submitted	Swenson,Richard Paul	06/09/2011 04:15 PM	Submitted for Approval
Approved	Swenson,Richard Paul	06/09/2011 04:16 PM	Unit Approval
Revision Requested	Andereck,Claude David	06/10/2011 03:33 PM	College Approval
Submitted	Swenson,Richard Paul	06/11/2011 11:27 AM	Submitted for Approval
Approved	Swenson,Richard Paul	06/11/2011 11:28 AM	Unit Approval
Approved	Andereck,Claude David	06/14/2011 02:29 PM	College Approval
Approved	Myers,Dena Elizabeth	06/15/2011 12:17 PM	GradSchool Approval
Pending Approval	Cameron,Erin Marie Soave,Melissa A	06/15/2011 12:17 PM	CAA Approval



College of Arts and Sciences

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June 14, 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 Biochemistry. This MS program involves completion of a thesis. The program has been modestly revised from its semester version through some changes in a few of the courses that make up the minor and by replacing a lab course with a laboratory rotations course.

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



Mark P. Foster, PhD

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Memo

To: Office of Academic Affairs
From: Mark P. Foster, Interim Chair, Department of Biochemistry
Date: 1/3/2011
Re: Semester Conversion Proposal – Biochemistry M.S. Degree (Thesis Option)

The Department of Biochemistry has the following programs to be converted for the quarter to semester system:

- The Undergraduate Biochemistry major (B.S. degree)
- The Undergraduate Biochemistry major (B.A. degree)
- The Undergraduate Biochemistry minor
- The Graduate Masters Degree (Thesis Option)
- The Graduate Ph.D. Degree (This program is administered by the campus-wide Ohio State Biochemistry Program)

The subject of this proposal is the Graduate Masters Degree (Thesis Option). Other programs will be submitted separately either by this department or the OSBP.

Prof. Richard P. Swenson served as the Department's Semester Conversion Coordinator. The process began during the fall, 2009 and proceeded through the academic year. Dr. Swenson met regularly with the Department's Curriculum Committee and individually or in groups with the course instructors over this time to obtain both a broad and course specific perspective on the conversion of our undergraduate curriculum and major.

The proposed course conversions and associated changes to the major were discussed at several faculty meetings and final unanimous faculty approval for the undergraduate curriculum conversion was given at the April 7, 2010 meeting and as modified at its December 1, 2010 meeting.*

A handwritten signature in blue ink that reads "Mark P. Foster".

*Note: Thirteen and 12 out of 15 eligible voting faculty were present at each meeting, respectively.

PROGRAM REQUIREMENTS

Program Rationale.

The Biochemistry M.S. degree (thesis option) represents a viable choice for students holding a bachelors degree in a suitable area who desire additional training in biochemistry beyond the bachelors degree but who do not wish to pursue a doctoral degree. Exceptional career opportunities exist for students with such advanced training in science either in academia, teaching, or industry. Students often find rewarding careers as laboratory managers and/or technical support staff within research institutes or universities. This program is based on the development of a foundation of advanced graduate courses encompassing current concepts in the field's knowledge base and method of study of the major biopolymers and biological processes. Training and experience in the process of research assists in developing the student's integration of the concepts as well as develop an appreciation and experience in the research process. Students generally complete most of the course requirements during their first year and then choose a thesis advisor and begin an independent research project typically during that following summer.

The M.S. degree program is reviewed on an ongoing basis by the Department. The structure of the curriculum is driven in large part by the courses developed and offered within the doctoral program in biochemistry as administered by the Ohio State Biochemistry Program (OSBP). Its curriculum committee has recommended several modifications to its core courses that will have only a small impact on our M.S. degree program but primarily in the structure and organization of some of the courses. The most significant changes involve the merger of Molecular Genetics 701 and Biochemistry 702 into a single semester course entitled "DNA Transactions and Regulation" as well as the combination of Biochemistry 761 and 766 into a single semester course covering advanced topics in the major biopolymers. Both mergers provide for great flexibility and efficiency in the instruction of the closely related subject areas in each instance. For example, the common methodology of study and similar conceptual basis involved for proteins and nucleic acid polymers can be taught in a more integrated manner and with less repetition than currently offered within the two separate quarter courses. Another minor change is the conversion of the quarter courses Biochemistry 762 (Enzymes) and 763 (Membranes and Bioenergetics) into 7-week "minimester" versions with some alteration in course content envisioned. These two topics can then be taught sequentially rather than simultaneously as might be required otherwise. Also, the faculty has discussed and approved the elimination of the current advanced graduate laboratory requirement (Biochemistry 706) in the semester system in favor of adding Biochemistry 6785, "Research Principles and Techniques", which will be fulfilled through authorized lab rotations.

SUMMARY OF QUARTER TO SEMESTER CONVERSION OF ALL BIOCHEMISTRY COURSES RELEVANT TO M.S. DEGREE

Current Course Number	Current Quarter Credit Hours	Level	Course Number	Suffix	Course Title	Transcript Abbreviation	Semstr Credit Hours	Fixed OR Variable Min	Variable Max	Repeatable?	Credit Hours/ Units Allowed	14 week	7 Week	4 Week (May Term)	12 Week (May + Summer)
(701)/702	6	Graduate	6701.		DNA Transactions; Regulation of Gene Expression	Regul Gene Express	Fixed	4.0		No		Yes			
761/766	6	Graduate	6761.		Advanced Biochemistry: Macromolecular Structure and	AdvBiochm-Macromol	Fixed	3.0		No		Yes			
762	3	Graduate	6762.		Advanced Biochemistry: Enzymes	AdvBiochm-Enzymes	Fixed	1.5		No		No	Yes		
763	2	Graduate	6763.		Advanced Biochemistry: Membranes and Lipids	AdvBiochm-Membrane	Fixed	1.5		No		No	Yes		
850	2	Graduate	6850.		Seminar in Biological Chemistry	Biochem Seminar	Fixed	1.0		Yes	28	Yes			
999	Variable	Graduate	6999.		Research for Masters Thesis	Thesis Research	Variable	1.0	12.0	Yes	99	Yes	Yes	Yes	Yes
770	3	Graduate	7770.		Advanced Biochemistry: Protein Engineering	Protein Engineerng	Fixed	2.0		No		Yes			
Possible electives:															
706	5	Graduate	6706.		Advanced Biological Chemistry Lab	Adv Biol Chem Lab	Fixed	4.0		No		Yes			
735/736	6	Graduate	6735.		Plant Biochemistry	Plant Biochemistry	Fixed	3.0		No		Yes			
764	3	Graduate	6764.		Advanced Biochemistry: Metabolism	AdvBiochm-Metabol	Fixed	2.0		No		No	Yes		
765	3	Graduate	6765.		Advanced Biochemistry: Physical Biochemistry	AdvBiochm-Physical	Fixed	3.0		No		Yes			
785	Variable	Graduate	6785.		Research Principles and Techniques	Res Prins & Techs	Variable	1.0	7.0	Yes	28	Yes	Yes		
795	Variable	Graduate	6795.		Special Topics in Biochemistry	Spl Tpcs Biochem	Variable	1.0	2.0	Yes	28	Yes	Yes		
(new)		Graduate	6998.		Graduate Research in Biochemistry	Graduate Research	Variable	1.0	12.0	Yes	24	Yes	Yes	Yes	Yes
775	3	Graduate	7775.		Biophysical Chemistry	Biophysical Chem	Fixed	2.0		No		Yes			
821	3	Graduate	8821.		Advanced Enzymology	Adv Enzymes	Fixed	2.0		No		Yes			
905	3	Graduate	8900.		Advanced Biochemistry: Biomolecular NMR	Biomolecular NMR	Fixed	2.0		No		Yes			
900	Variable	Graduate	8990.		Advanced Topics in Biochemistry	AdvTopics-Biochem	Variable	1.0	2.0	Yes	16	Yes	Yes	Yes	Yes

Version: 03/03/2011

Last name: _____ Address: _____
 First Name: _____
 Middle: _____ City: _____
 OSU ID: _____ Zip Code: _____
 lastname.#: _____
 Expected graduation: _____ Quarter: _____ Year: _____

Have you filed a degree application in the college office? Yes _____ No _____
 (NOTE: This form is **NOT** a degree application)

Part A. Minimum grade average of "B" (3.00) required)
Core Requirements (Substitutions are rarely, if ever, permitted)

Course	Hours	Grade	Course	Hours	Grade
Molecular Genetics 701	3		Biochemistry 766	3	
Biochemistry 702	3		Biochemistry 706	5	
Biochemistry 761	3		Biochemistry 770	3	
Biochemistry 762	3		Biochemistry 850	2	
Biochemistry 763	2		Biochemistry 999	≥15	

Part B. Electives (Total of 3 hours required from approved list of electives)

Course	Hours	Grade	Course	Hours	Grade

(≥45 + optional hours)
 Total of Parts A & B

Check whether this is: original _____ revision _____

 Signature of faculty advisor Date

 Name of advisor (please print)

Distribution: One copy each- _____ Student
 _____ Dept Office

 Signature of department advisor Date

Last name: _____

First Name: _____

Middle: _____

OSU ID: _____

lastname.#: _____

Expected graduation: _____ Semester: _____

Year: _____

Have you filed a degree application in the college office? Yes _____ No _____

(NOTE: This form is **NOT** a degree application)

Part A. Minimum grade average of "B" (3.00) required)

Core Requirements (Substitutions are rarely, if ever, permitted)

Course	Hours	Grade
Biochemistry 6701	4	
Biochemistry 6761	3	
Biochemistry 6762	1.5	
Biochemistry 6763	1.5	

Course	Hours	Grade
Biochemistry 7770	2	
Biochemistry 6850	2	
Biochemistry 6785	2	
Biochemistry 6999	≥16	

Part B. Electives (Total of 2 hours required from approved list of electives)

Course	Hours	Grade

Course	Hours	Grade

(≥30 + optional hours)

Total of Parts A & B

Check whether this is: original _____ revision _____

Signature of faculty advisor Date

Name of advisor (please print)

Distribution: One copy each- _____ Student
_____ Dept Office

Signature of department advisor Date

Transition policy statement.

The transition planning by the faculty was conducted in the context of the requirement that the conversion from quarters to semesters would not delay graduate or disrupt progress towards a degree. No significant transitional issues are anticipated. Students entering into the program at the beginning of the 2011-12 academic year will be provided with course information under the current quarter system as well as under semesters beginning in their second year. To aid in their planning, they will be provided with also examples of the two-year schedule during the transition and under the semester system (see appendices).

Appendix. EXAMPLE - THREE-YEAR TRANSITIONAL SCHEDULE FOR THE BIOCHEMISTRY M.S. (THESIS)

YEAR 1 UNDER QUARTER SYSTEM:

<i>Autumn Quarter:</i>	<i>cr hr</i>	<i>Winter Quarter:</i>	<i>cr hr</i>	<i>Spring Quarter:</i>	<i>cr hr</i>
Molecular Genetics 701	3	Biochemistry 702	3	Biochemistry 999	6
Biochemistry 761	3	Biochemistry 763	2	Elective (≥ 3 crhrs)*	3
Biochemistry 762	3	Biochemistry 766	3		
Biochemistry 850	1	Biochemistry 850	1		
Total Credit hours	<u>10</u>		<u>9</u>		<u>9</u>

SUMMER TERM BETWEEN YEAR 1 AND 2:

(Biochemistry 999)**

YEAR 2 UNDER SEMESTER SYSTEM:

<i>Autumn Semester:</i>		<i>Spring Semester:</i>		<i>May/Summer Term:</i>
Biochemistry 7770	2	Biochemistry 6999	9	(Biochemistry 6999)**
Biochemistry 6999	7			
Total Credit hours	<u>9</u>		<u>9</u>	
			<u>28</u>	overall quarter crhrs
			18	overall minimum semester crhrs

YEAR 3 AND BEYOND AS NEEDED UNDER SEMESTER SYSTEM:

<i>Autumn Semester:</i>		<i>Spring Semester:</i>		<i>May/Summer Term:</i>
Biochemistry 6999***	9	Biochemistry 6999***	9	(Biochemistry 6999)***

* One elective from an approved list in the biological or physical sciences at >5000 (>6000 for departmental courses) required

** Additional thesis research credits could be achieved during the Summer Term between the 1st and 2nd year

***As needed to complete thesis research requirement

Appendix. EXAMPLE - THREE-YEAR SEMESTER SCHEDULE FOR THE BIOCHEMISTRY M.S. (THESIS)

YEAR 1:				
<i>Autumn Semester:</i>	<i>cr hr</i>	<i>Spring Semester:</i>	<i>cr hr</i>	<i>May and Summer Terms:</i>
Biochemistry 6701	4	Biochemistry 6762 (First 7 weeks)	1.5	(Biochemistry 6999)**
Biochemistry 6761	3	Biochemistry 6763 (Second 7 weeks)	1.5	
		Elective (≥ 2 crhrs)*	2	
Biochemistry 6850	1	Biochemistry 6785 (lab rotations)	2	
	<hr/>	Biochemistry 6850	<hr/>	
	8		8	

YEAR 2:				
<i>Autumn Semester:</i>		<i>Spring Semester:</i>		<i>May and Summer Terms:</i>
Biochemistry 7770	2	Biochemistry 6999	9	(Biochemistry 6999)**
Biochemistry 6999	<hr/>		<hr/>	
	7		9	
	<hr/>		<hr/>	
	9		9	
	<hr/>		<hr/>	
	17		17	
Total minimum credit hours (Yr 1&2)	<hr/> <hr/>		<hr/> <hr/>	
	17	total overall minimum:	34	(≥ 30 crhr required)

YEAR 3 AND BEYOND AS NEEDED UNDER SEMESTER SYSTEM:				
<i>Autumn Semester:</i>		<i>Spring Semester:</i>		<i>May and Summer Terms:</i>
Biochemistry 6999***	9	Biochemistry 6999***	9	(Biochemistry 6999)***

* One elective from an approved list in the biological or physical sciences at >5000 (>6000 for departmental courses) required

** Additional thesis research credits could be achieved during the May and Summer Terms

***As needed to complete thesis research requirement

Summary: Biochemistry M.S. degree (thesis option) - Conversion to Semesters (version 6/1/2011)

Segment of major program	Quarter course #	Quarter course name	Current Qtr Credit hours	Semester course #	Semester course name	Proposed Semester Units	Calculated Direct 2/3 Conversion	Change in Credit Hrs	
Core degree requirements in department	Biochemistry 702	DNA Transactions	3						
	Molecular Genetics 701	Regulation of Gene Expression	3	Biochemistry 6701	DNA Transactions and Regulation	4			
	Biochemistry 761	Proteins	3						
	Biochemistry 766	Nucleic Acids	3	Biochemistry 6761	Adv Biochemistry: Macromolecular Structure & Function	3			
	Biochemistry 762	Enzymes	3	Biochemistry 6762	Advanced Biochemistry: Enzymes	1.5			
	Biochemistry 763	Membranes and Bioenergetics	2	Biochemistry 6763	Advanced Biochemistry: Membranes and Lipids	1.5			
	Biochemistry 770	Protein Engineering	3	Biochemistry 7770	Advanced Biochemistry: Protein Engineering	2			
	Biochemistry 706	Biological Chemistry Laboratory	5	Biochemistry 6785	Research Principles and Techniques*	2			
	Biochemistry 850	Seminar	2	Biochemistry 6850	Seminar (1st year-1 unit each semester)	2			
Total Core (Dept) Quarter Credit Hours:			27	Total Core (Dept) Semester Units:			16	18	-2
Electives:	Total of 3 credit hours chosen from:			Electives (minimum of 2 semester units chosen from):					
	Chemistry	632, 651, 652, 731, 733		Chemistry	Semester equivalents as established				
	Microbiology	509, 520, 521, 649, 670, 680, 723		Microbiology	Semester equivalents as established				
	Molecular Genetics	622, 640, 650, 705, 715, 734		Molecular Genetics	Semester equivalents as established				
	Other Sciences	>500 level (>600 for departmental courses)		Other Sciences	>5000 level (>6000 for departmental courses)				
Total Electives Quarter Credit Hours:			3	Total Electives Semester Units:			2	2	0
Research:	Biochemistry 999	Thesis Research	15	Biochemistry 6999	Research for Dissertation or Thesis	16	10	+6	
Total credit hours/units required for degree:			45	(45 crhrs required)		34	(30 semester units required)		

*formal laboratory course requirement dropped in favor of Biochemistry 6785 (fulfilled through lab rotations)