NEW, REVISED, OR DELETED PROGRAM COVER SHEET
2008-2009
University Curriculum Committee
Undergraduate Programs (Majors, Minors, Sequences)

DEPARTMENT/SCHOOL ___Biological Sciences_____ DATE _____06-10-2008_____

CONTACT(S) Kevin Edwards EMAIL ADDRESS kaedwar@ilstu.edu

A. **Proposed Action:** (more than one item may be checked if a revision).

_____ New Major CIPS CODE _____ (obtain from Planning, Policy Studies and Info Systems)

_____ New Minor CIPS CODE _____ (obtain from Planning, Policy Studies and Info Systems)

____**X**__ New Sequence: **Molecular Biology**

____**X**____ Change in requirements for major

_____ Change in requirements for minor

_____ Change in requirements for sequence

_____ Other program revisions

_____ More than 50% of courses in this program are distance education.

_____ Program deletion

B. **Summary of proposed action** (see Part A), including title and exact *Undergraduate Catalog* copy for a new or altered program. (See *Catalog* and Program Checklist for format and examples.) Provide a summary of the revisions in addition to the exact current *Catalog* copy.
See attached.

C. **Routing and action summary:**

1. _____ Department/School Curriculum Committee Chair	_____ Date Approved	4. _____ College Dean	_____ Date Approved
2. _____ Department Chair/School Director	_____ Date Approved	5. _____ Teacher Education Council Chair if appropriate (10 copies to the Dean of the College of Education)	_____ Date Approved
3. _____ College Committee Chair	_____ Date Approved	6. _____ University Curriculum Committee Chair (8 copies to UCC Secretary, Moulton 102)	_____ Date Approved

Submit 8 copies of **NEW** Undergraduate proposals to University Curriculum Committee
Submit 8 copies of **REVISED** Undergraduate proposals to University Curriculum Committee
All new and deleted programs (majors, minors, sequences) are routed by the U.C.C. to the Academic Senate. **The Senate rules mandate electronic submission (in MS Word or HTML format) of all materials for Web site posting.**
3/05

NEW, REVISED, OR DELETED PROGRAM COVER SHEET
2008-2009
University Curriculum Committee
Undergraduate Programs (Majors, Minors, Sequences)

DEPARTMENT/SCHOOL ___Chemistry_____ DATE _____06-10-2008_____

CONTACT(S) Jon Friesen EMAIL ADDRESS jfriese@ilstu.edu

A. **Proposed Action:** (more than one item may be checked if a revision).

_____ New Major CIPS CODE _____ (obtain from Planning, Policy Studies and Info Systems)

_____ New Minor CIPS CODE _____ (obtain from Planning, Policy Studies and Info Systems)

____**X**__ New Sequence: **Molecular Biology**

____**X**____ Change in requirements for major

_____ Change in requirements for minor

_____ Change in requirements for sequence

_____ Other program revisions

_____ More than 50% of courses in this program are distance education.

_____ Program deletion

B. **Summary of proposed action** (see Part A), including title and exact *Undergraduate Catalog* copy for a new or altered program. (See *Catalog* and Program Checklist for format and examples.) Provide a summary of the revisions in addition to the exact current *Catalog* copy.

D. **Routing and action summary:**

1. _____ Department/School Curriculum Committee Chair	_____ Date Approved	4. _____ College Dean	_____ Date Approved
2. _____ Department Chair/School Director	_____ Date Approved	5. _____ Teacher Education Council Chair if appropriate (10 copies to the Dean of the College of Education)	_____ Date Approved
3. _____ College Committee Chair	_____ Date Approved	6. _____ University Curriculum Committee Chair (8 copies to UCC Secretary, Moulton 102)	_____ Date Approved

Submit 8 copies of **NEW** Undergraduate proposals to University Curriculum Committee
Submit 8 copies of **REVISED** Undergraduate proposals to University Curriculum Committee
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3/05

Institution: Illinois State University
Responsible department(s): Biological Sciences & Chemistry
Program title: Major in Biochemistry / Molecular Biology: Molecular Biology Sequence
Date of Implementation:
08-16-09
Description of proposed program change:
The Departments of Biological Sciences and Chemistry will continue to jointly offer the undergraduate degree in Biochemistry / Molecular Biology (BMB). However, the BMB degree will be offered such that students can choose from two sequences, either a Molecular Biology sequence or a Biochemistry sequence. Specific courses and plans of study are detailed below.

Rationale for proposal:

The Biochemistry and Molecular Biology (BMB) Program was initiated in August 2000 as an independent degree program coordinated by the Departments of Biological Sciences and Chemistry. The BMB program is an increasingly popular degree option for pre-professional students, especially pre-medical, and students that plan to pursue an advanced degree in life sciences. In the 2006-2007 academic year there were 110 students in the program and 30 graduates. The BMB program has enjoyed the tremendous growth and success in its seven years of existence and the enrollment increase experienced by the program illustrates the great interest students have in Biochemistry and Molecular Biology. The BMB program, however, is currently serving two subgroups of students, those that wish to receive training in Biochemistry and those that desire courses and labs that will provide training in molecular biology. Offering the two proposed sequences in addition to the current BMB major would allow the program to provide degree options to better train our students for graduate school and the workforce. In addition, the increase in the number of hours from elective courses would allow greater flexibility for the pre-professional students, especially those that are destined for medical school, dental school, and pharmacy school which require specific additional courses for admission to specific graduate programs. Also, the BMB degree will more easily be able to be combined with a minor in criminal justice, allowing the large number of students being trained for positions in forensic science to complete their degrees while taking the optimal combination of courses.

The rationale for the structure of the Molecular Biology sequence is as follows. Molecular biology is the study of DNA, RNA, and proteins (including their synthesis, function, and regulation), from the atomic to the cellular scale, in the context of living systems. Molecular biology is rooted in the field of microbiology, and today nearly all molecular biologists make use of at least one bacterium (*E. coli*) as a factory to produce DNA and proteins. Microbiology is also essential for all future health care professionals, who must learn how to deal with pathogenic bacteria. Thus, this sequence will require Microbiology (BSC260, which is already taught every semester). This requirement helps to distinguish the sequence from the Biological Sciences major, which does not require BSC260. Current BMB students are already advised to take BSC260 as an elective, and in 2007, 16 of the 101 BSC260 students were declared BMB majors. Therefore we do not anticipate a drastic increase in BSC 260 enrollment. The other changes are to make optional several CHE courses that are now required for the BMB degree: Biochemistry Lab (CHE343), Physical Biochemistry (CHE370), and Instrumental Analysis (CHE315). These courses are a better fit for the Biochemistry sequence and will remain in the curriculum for those in the Biochemistry sequence. CHE343, for example, often shares overlaps with BSC220. The resulting requirements for the Molecular Biology sequence provide an improved balance between CHE and BSC courses relative to the current BMB degree. The sequence also provides increased elective hours, giving the student time to learn advanced fields for which molecular biology training is in strong demand (Immunology, Neurobiology, Developmental Biology, and others).

The existing BMB degree, which requires approximately twice as many Chemistry hours as Biological Sciences hours, already contains the framework of a Biochemistry sequence. Therefore, the changes proposed are minor relative to the Molecular Biology sequence. BSC 220 duplicates much of what is learned in CHE 343, therefore BSC 220 will not be required for the Biochemistry sequence. Instead of requiring BSC 350, students in the Biochemistry sequence can choose form a variety of BSC electives, providing greater flexibility.

There will be no impact on existing campus programs except for the BMB program and no additional staffing arrangements are required. No additional funding is required for curricular changes. There are no additional library resources required for the proposed changes. Current catalog copy that has been removed includes the recommended foreign language elective, which is not necessary due to the College of Arts and Sciences foreign language requirement, and optional electives, which are too numerous to list with the new sequences.

Current Plan of Study - Biochemistry and Molecular Biology Degree

Course	Hours	
ENG 101	3	inner core [IC]
COM 110	3	inner core [IC]
MAT 145 Calculus I	4	inner core [IC-M]
MAT 146 Calculus II	4	middle core [MC-QR]
CHE 140 Gen. Chemistry I	4	inner core [IC-NSA]
CHE 141 Gen. Chemistry II	4	
CHE 215 Analytical Chem.	2	
CHE 230 Organic Chemistry I	3	
CHE 231 Org. Chem. I Lab	1	
CHE 232 Organic Chem. II	3	
CHE 233 Organic Chem. II Lab	2	
CHE 315 Instrumental Anal.	3	
CHE 342 Biochemistry I	3	
CHE 343 Biochemistry Lab	2	
CHE 344 Biochemistry II	3	
CHE 360 Physical Chemistry I or 370 Physical Biochemistry	3	
CHE 361 Physical Chemistry Lab	1	
BSC 196 Biological Diversity	4	inner core [IC-NSA]
BSC 197 Mol./Cell. Biology	4	
BSC 203 Cell Biology	3	
BSC 219 Genetics	3	
BSC 220 Mol. Gen. Cell Biol. Lab	2	
BSC 350 Molecular Biology	3	
BSC310 / CHE310 (BSC304) Seminar	1	
PHY 108 (110) Gen. Physics	5 (4)	
PHY 109 (111) Gen. Physics II	5 (4)	
Electives	18 (20)	
4 Middle Core Electives	12	
4 Outer Core Electives	12	
Total Semester Hours	120 h	

Proposed Plan of Study
Biochemistry and Molecular Biology Degree, Molecular Biology Sequence
Strikethrough indicates course removed, shading indicates added course; parentheses indicate cr. hr. variation due to the two Physics options

ENG 101	3	inner core [IC]
COM 110	3	inner core [IC]
MAT 145 Calculus I	4	inner core [IC-M]
MAT 146 Calculus II	4	middle core [MC-QR]
CHE 140 Gen. Chemistry I	4	inner core [IC-NSA]
CHE 141 Gen. Chemistry II	4	
CHE 215 Analytical Chem.	2	
CHE 230 Organic Chemistry I	3	
CHE 231 Org. Chem. I Lab	1	
CHE 232 Organic Chem. II	3	
CHE 233 Organic Chem. II Lab	2	
~~CHE 315 Instrumental Anal.~~	~~3~~	
CHE 342 Biochemistry I	3	
~~CHE 343 Biochemistry Lab~~	~~2~~	
CHE 344 Biochemistry II	3	
~~CHE 360 Physical Chemistry I or 370 Physical Biochemistry~~	~~3~~	
~~CHE 361 Physical Chemistry Lab~~	~~1~~	
BSC 196 Biological Diversity	4	inner core [IC-NSA]
BSC 197 Mol./Cell. Biology	4	
BSC 203 Cell Biology	3	
BSC 219 Genetics	3	
BSC 220 Cell Biology Lab	2	
BSC 260 Microbiology	4	
BSC 350 Molecular Biology	3	
BSC310 / CHE310 (BSC304) Seminar	1	
PHY 108 (110) Gen. Physics	5 (4)	
PHY 109 (111) Gen. Physics II	5 (4)	
Electives	18 (20)	courses 200-level or greater
Additional Electives	5 (7)	courses 200-level or greater
At least 6 elective hours at 300-level in CHE or BSC		
4 Middle Core Electives	12	
4 Outer Core Electives	12	
Total Semester Hours	120 h	

Current catalog copy (chemistry on left, biological sciences on right)

Biochemistry/ Molecular Biology Program

Degrees Offered: B.S.

The Biochemistry/Molecular Biology (BMB) Program is cross-listed by the Departments of Chemistry and Biological Sciences.

HONORS IN BIOCHEMISTRY/MOLECULAR BIOLOGY

Students can receive BMB Honors with additional course work. Additional requirements include: (1) participation in the University Honors Program, (2) a cumulative grade point of 3.30, as well as a 3.50 average in Biochemistry/Molecular Biology, and (3) the courses: MAT 147, PHY 110 and 111, CHE/BSC 299**, 8 hours of foreign language and one of the following: a computer programming course, CHE/PHY 318 or CHE 380.37.

**Students intending to pursue Departmental Honors in BMB should contact the BMB Program Coordinator prior to enrolling in CHE 230. To receive BMB Honors, two semester hours credit in CHE/BSC 299 must be completed and result in a research paper written in a style acceptable for thesis research. The research paper must be defended in a program seminar.

MAJOR IN BIOCHEMISTRY/MOLECULAR BIOLOGY PROGRAM

— 34 hours required in Chemistry, 19 hours in Biological Sciences and 1 hour in Biochemistry/Molecular Biology Seminar.
— Required courses: CHE 140, 141, 215, 230, 231, 232, 233, 315, 342, 343, 344, 360, 361; BSC 196, 197, 203, 219, 220, 350; BSC/CHE 310.
— 1 year of calculus (MAT 145 and MAT 146) and 1 year of physics (PHY 108 and 109 or PHY110 and 111) must be completed prior to enrolling in CHE 360 or CHE 361.
— The following courses are in the General Education program: BSC 196, 197; CHE 140; MAT 145; PHY 108, 110.
— The following general electives are highly recommended: 1 year of a foreign language, a course in computer programming, and a course in technical writing (ENG 249 Technical Writing).
— Optional electives, in consultation with the BMB advisor, may be selected from the following: BSC 253, 260, 283, 305, 321, 326, 329, 353, 354, 361, 367, 368, 380; 389.28; CHE 290, 350, 351, 362, 363, and certain CHE 380-level courses with approval of the BMB advisor.
— American Chemical Society Certification can be obtained by completing the Chemistry major requirements. Additional requirements include CHE 350, 351, 362, 363.
— Molecular Biology Emphasis; Recommended courses include BSC 260, 353 and 354.

Biochemistry/Molecular Biology Course

310 BIOCHEMISTRY/MOLECULAR BIOLOGY SEMINAR 1
BSC 197, BSC 203 or 219; CHE 215, CHE 342 req. Also offered as BSC 310.
Introduction to scientific literature searching and techniques of oral and written scientific communication, focusing on current topics in biochemistry/molecular biology.

Biochemistry/ Molecular Biology Program

Degrees Offered: B.S.

This Biochemistry/Molecular Biology Program (BMB) is cross-listed by the Departments of Chemistry and Biological Sciences.

HONORS IN BIOCHEMISTRY/MOLECULAR BIOLOGY

Students can receive BMB Honors with additional course work. Additional requirements include: (1) participation in the University Honors Program, (2) a cumulative grade point of 3.30, as well as a 3.50 average in Biochemistry/Molecular Biology, and (3) the courses: MAT 147, PHY 110 and 111, BSC/CHE 299**, 8 hours of foreign language and one of the following: a computer programming course, CHE/PHY 318, or CHE 380.37.

**Students intending to pursue Departmental Honors in BMB should contact the BMB Program Coordinator prior to enrolling in CHE 230. To receive BMB Honors, two semester hours credit in BSC/CHE 299 must be completed and result in a research paper written in a style acceptable for thesis research. The research paper must be defended in a program seminar.

MAJOR IN BIOCHEMISTRY/MOLECULAR BIOLOGY PROGRAM

— 34 hours required in Chemistry, 19 hours in Biological Sciences and 1 hour in Biochemistry/Molecular Biology Seminar.
— Required courses: CHE 140, 141, 215, 230, 231, 232, 233, 315, 342, 343, 344, 360, 361; BSC 196, 197, 203, 219, 220, 350; BSC/CHE 310.
— 1 year of calculus (MAT 145 and MAT 146) and 1 year of physics (PHY 108 and 109 or PHY110 and 111) must be completed prior to enrolling in CHE 360 or CHE 361.
— The following courses are in the General Education program: BSC 196, 197; CHE 140; MAT 145; PHY 108, 110.
— The following general electives are highly recommended: 1 year of a foreign language, a course in computer programming, and a course in technical writing (ENG 249 Technical Writing).
— Optional electives, in consultation with the BMB Advisor, may be selected from the following: BSC 253, 260, 283, 305, 321, 326, 329, 353, 354, 361, 367, 368, 380; 389.28; CHE 290, 350, 351, 362, 363, and certain CHE 380-level courses with approval of the BMB advisor.
— American Chemical Society Certification can be obtained by completing the Chemistry major requirements. Additional requirements include CHE 350, 351, 362, 363.
— Molecular Biology Emphasis: recommended courses include BSC 260, 353, and 354.

Biochemistry/Molecular Biology Course

310 BIOCHEMISTRY/MOLECULAR BIOLOGY SEMINAR 1
BSC 197, BSC 203 or 219; CHE 215, CHE 342 req. Also offered as CHE 310.
Introduction to scientific literature searching and techniques of oral and written scientific communication, focusing on current topics in biochemistry/molecular biology.

Biochemistry / Molecular Biology Program

Degrees Offered: B.S.

The Biochemistry / Molecular Biology Program (BMB) Program is cross-listed by the Departments of Chemistry and Biological Sciences.

HONORS IN BIOCHEMISTRY / MOLECULAR BIOLOGY

Students may receive BMB honors with additional course work. Additional requirements are: (1) fulfill the general requirements for participation in the University Honors Program. (2) a cumulative GPA of at least 3.30 and at least 3.50 in Biochemistry / Molecular Biology courses and (3) the courses MAT147, PHY110 and 111 and two hours of CHE/BSC 299.

MAJOR IN BIOCHEMISTRY / MOLECULAR BIOLOGY

General sequence

- 34 hours required in Chemistry, 19 hours in Biological Sciences, and 1 hour in Biochemistry / Molecular Biology seminar.
- Required courses: CHE 140, 141, 215, 230, 231, 232, 233, 315, 342, 343, 344, 360 or 370, 361; BSC 196, 197, 203, 219; 220, 350; CHE/BSC 310.
- 1 year of Calculus (MAT 145 and MAT 146) and 1 year of Physics (PHY 108 and 109 or PHY 110 and 111) must be completed prior to enrolling in CHE 360, CHE 370 or CHE 361.
- The following courses are in the General Education Program: BSC 196, 197; CHE 140; MAT 145; PHY 108, 110.

Biochemistry sequence

- 34 hours required in Chemistry, 17 hours in Biological Sciences, and 1 hour in Biochemistry / Molecular Biology seminar.
- Required courses: CHE 140, 141, 215, 230, 231, 232, 233, 315, 342, 343, 344, 360 or 370, 361; BSC 196, 197, 203, 219; CHE/BSC 310.
- 1 year of Calculus (MAT 145 and MAT 146) and 1 year of Physics (PHY 108 and 109 or PHY 110 and 111) must be completed prior to enrolling in CHE 370 or CHE 361.
- The following courses are in the General Education Program: BSC 196, 197; CHE 140; MAT 145; PHY 108, 110.
- 3 hours of elective credit in BSC 200-level or greater

Molecular Biology Sequence:

- 25 hours required in Chemistry, 23 hours in Biological Sciences, and 1 hour in Biochemistry / Molecular Biology seminar.
- Required courses: CHE 140, 141, 215, 230, 231, 232, 233, 342, 344; BSC 196, 197, 203, 219, 220, 260, 350; CHE/BSC 310.
- 1 year of Calculus (MAT 145 and MAT 146) and 1 year of Physics (PHY 108 and 109 or PHY 110 and 111) must be completed.
- The following courses are in the General Education Program: BSC 196, 197; CHE 140; MAT 145; PHY 108, 110.
- 6 hours of elective credit in BSC or CHE at 300-level.

ILLINOIS STATE UNIVERSITY
UNDERGRADUATE PROGRAMS

Program Proposal Financial Implications Form
For Request for New Program Approval

Purpose: Proposed new undergraduate programs (degrees, sequences, certificates) must include information concerning how the program will be financially supported to proceed through the curriculum proposal process**.** Signatures of the College Dean and Provost/Provost Representative are required prior to submission of the new program to the College Curriculum Committee.

Procedure: This completed form, with all necessary signatures, is to be attached to new program curricular proposals.

Definition: A "program" can be either a degree, a sequence as part of a degree or a certificate.

Complete the following information:

Department: Biological Sciences/Chemistry Date: 06-10-2008

Proposed New Program: **New Sequence in Molecular Biology** within existing Biochemistry / Molecular Biology Degree

Person Completing Form: Kevin Edwards Contact #: 438-7689

Complete Table I to show student enrollment projections for the program.

Table I
STUDENT ENROLLMENT PROJECTIONS FOR THE NEW PROGRAM

	1st Year (July – June)	**2nd Year**	**3rd Year**	**4th Year**	**5th Year**
Number of Program Majors (Fall headcount)	50	50	50	50	50
Annual Full-Time-Equivalent Majors	50	50	50	50	50
Annual Credit Hours in EXISTING Courses[1]	1500	1500	1500	1500	1500
Annual Credit Hours in NEW Courses[1]	0	0	0	0	0
Annual Number of degrees Awarded	10	10	10	10	10

[1]Include credit hours generated by both majors and non-majors in courses offered by the academic unit directly responsible for the proposed program.

Complete Table II (even if no new funding is requested). Show all required resources including amounts and sources of funds reallocated from other programs or units.

Table II
PROJECTED RESOURCE REQUIREMENTS FOR THE NEW PROGRAM

	1st Year (July – June)	2nd Year	3rd Year	4th Year	5th Year
FTE Staff[1] (FTE)	0	0	0	0	0
Personnel Services ($)	0	0	0	0	0
Equipment and Instructional Needs ($)	0	0	0	0	0
Library ($)	0	0	0	0	0
Other Support Services[2] ($)	0	0	0	0	0

[1]Reflects the number of FTE staff to be supported with requested funds. Not a dollar entry.

[2]Other dollars directly assigned to the program. Do not include allocated support services.

Budget narrative listing projected sources of program funding (including sources of reallocated funds).
The Biochemistry / Molecular Biology (BMB) Program was initiated in August 2000 and is run jointly by the Departments of Chemistry and Biological Sciences. The BMB program is proposing to establish two sequences within the major, one sequence in Biochemistry and a second in Molecular Biology. These sequences will result in a redistribution of existing students and a significant increase in enrollment is not anticipated. No new funds are required for the sequences.

Routing and action summary:

1. _____ _____
   Department/School Curriculum Committee Chair — Date Approved

2. _____ _____
   Department Chairperson/School Director — Date Approved

3. _____ _____
   College Dean — Date Approved

4. _____ _____
   Provost/Provost Representative — Date Approved

5. _____ _____
   College Curriculum Committee Chairperson — Date Approved

6. _____ _____
   Teacher Education Council Chair — Date Approved

7. _____ _____
   University Curriculum Committee Chairperson — Date Approved

Once approved, please include this form with the curricular proposal for the new program. Please also submit an electronic copy of this form.