New Undergraduate Program (Majors, Minors, Sequences) Proposal
Illinois State University - University Curriculum Committee

Program Department Biological Sciences **Submission Date** Thursday, September 15, 2011
Initiator Kevin Edwards **Email** kaedwar@ilstu.edu
Phone 438-7689 **Campus Address** 4120 Biological Sciences
Initiator Department Biological Sciences
Coauthor(s) Erik Larson (elarson@ilstu.edu), Craig Gatto (cgatto@ilstu.edu), Megan Larson (mrlarso@ilstu.edu) **Version** 5
Title of New Program Molecular and Cellular Biology **Proposed Starting Catalog Year** 2014-2016

1. Proposed Action

✓ New Major **Major CIPS Code** 26.0406

New Minor

New Sequence

More than 50% of courses in this program are Distance Education

Degree Type(s)

Bachelor of Science

2. Provide *Undergraduate Catalog* copy for new program.

MAJOR IN MOLECULAR & CELLULAR BIOLOGY

—72 total hours are required.

—37 hours required in Biological Sciences.

—Required Biological Sciences courses (22 hours): BSC 196*, 197*, 203, 204, 219, 260*, 350 (* denotes laboratory courses).

—A minimum of 6 hours in 300-level Biological Sciences courses is required, selected from the following: BSC 329, 343, 345, 346, 351, 353*, 354*, 355, 361*, 365, 367*, 370.

—Students must pass five BSC courses with laboratories (*).

—8-10 hours required in Physics: Either PHY 108 and 109 (10 hr), or PHY110 and 111 (8 hr).

—7-8 hours required in Math: MAT 145 and 146. NOTE: One of the following may substitute for MAT 146: ECO 138, GEO 138, or PSY 138.

—20 hours required in Chemistry: CHE 140, 141, 230, 231, 232, 233, 342. Advisor may substitute 242 for 342.

—BSC 202, 307, and Biological Sciences courses below 195 may not be used in the major.

—A minimum of 12 hours in Biological Sciences must be completed at Illinois State University.

HONORS IN MOLECULAR AND CELLULAR BIOLOGY

In order to graduate with honors in Molecular and Cellular Biology, a student must complete: (1) all regular requirements for the Molecular and Cellular Biology Major; (2) Mathematics through 2 semesters of calculus; (3) 12 hours of Biological Sciences on a tutorial basis (i.e., in-course honors) with a grade of A or B in each; (4) 3 hours of BSC 299; (5) 1 hour BSC 303 Senior Thesis; and (6) have at the time of graduation a cumulative GPA of at least 3.30 and at least 3.50 in Biological Sciences courses.

3. Provide a description for the proposed program.

The MCB major is designed to train students in the range of biological fields spanning biochemistry and molecular biology, through cell biology, to organismal development and physiology. Students obtaining an MCB degree will thus be well prepared to become health care professionals, life science researchers, and members of the biotechnology industry. Indeed, we expect MCB to become the major of choice for pre-med students.

Compared to the existing Major in Biological Sciences, MCB removes the requirement for undergraduate-level Evolution (BSC297, still available as an elective), and adds BSC203 Cell Biology, BSC260 Microbiology, and BSC350 Molecular Biology. MCB also requires two additional 300-level courses in the field, to be selected from a list of 12 options:

BSC 329 Human Genetics
BSC 343 Intro. Neurobiology
BSC 345 Intro. Endocrinology
BSC 346 Developmental Biol.
BSC 351 Cell Signaling & Regulation (3 hr) *proposal in progress*
BSC 353 Biotech Lab I
BSC 354 Biotech Lab II
BSC 355 Genomics & Bioinformatics
BSC 361 Microbial Pathogens
BSC 365 Bioenergy
BSC 367 Immunology
BSC 370 Topics in Molecular & Cellular Biology (3 hr) *proposal in progress*.

The MCB major also has more stringent requirements in Math, Physics, and Chemistry than does the Major in Biological Sciences, in accord with typical requirements for medical schools.

There is a reasonable amount of flexibility for entering students who are unsure whether they should major in Biological Sciences, MCB, or the planned Biochemistry major (to be proposed by the Chemistry Department). Students who may wish to transfer into MCB can do so with relative ease, since the typical freshman and sophomore years are very similar for MCB, Biological Sciences, and Biochemistry. The student must take the higher level math and physics options to retain the most flexibility, but they are advised to do so anyway if they declare as pre-professional. A transfer from MCB to Biological Sciences at any point would require only adding BSC 297 and one lab course. However, MCB differs sharply from Biochemistry in the latter two years, with Biochemistry requiring an additional 12 courses in Chemistry beyond the MCB requirements.

4. Provide a rationale of proposed program.

5. Describe the expected effects of the proposed program on existing campus programs (if applicable).

This program will provide a degree alternative to the students who are interested in the Molecular Biology sequence of the current Biochemistry and Molecular Biology degree program that is being deleted from the University offering. The effects on Math and Physics are minimal, and have been approved by those departments (see attachment).

The MCB major within Biological Sciences will replace the existing Biochemistry and Molecular Biology (BMB) major (~100 students), which is now shared between Biological Sciences and the Department of Chemistry. In parallel with this proposal, the Department of Chemistry will propose a separate Biochemistry major. Thus, in essence, the existing BMB program will be split into two new majors, housed in the respective units, and the shared BMB major will be phased out. The BMB major is in high demand, and this demand exceeds the capacity of the shared program, which does not have its own dedicated support staff or facilities. By splitting the BMB major into two majors, we should be able to offer more comprehensive support to the students in this field. The MCB major is a variation on the existing Sequence in Molecular Biology within the BMB major, which enrolls 27 students as of Jan 2011. The requirements for the proposed MCB major are intermediate between those of the existing Biology major and the Sequence in Molecular Biology. Thus we expect that MCB will attract an enrollment equal to all 27 current Sequence in Molecular Biology students, half of the 64 general (non -sequence) BMB students, and about 1/3 to 1/2 of the ~460 (non-education) Biology majors, for a total of ~250 students. We also envision that MCB will attract some additional students to ISU who are looking specifically for a Molecular & Cellular Biology major coupled with strong undergrad research.

6. Provide a sample four year plan of study demonstrating that a student could realistically complete the program requirements in a specific number of semesters.

See attached PDF file

7. Describe the expected curricular changes required, including new courses. If proposals for new courses have also been submitted, please reference those related proposals here:

The MCB major can be established with no new courses, since it essentially replaces the existing Molecular Biology sequence. No major curriculum changes are planned. However, as part of normal turnover of faculty and courses, two new courses (proposals in progress) are being added to the "basket" of 300-level options for the MCB major. One of these is BSC 351, Cell Signaling and Regulation (3 cr hr). The other is BSC 370, Topics in Molecular & Cellular Biology (3 cr hr). Both are under consideration by the CCC as of Sept. 2011. While these courses add flexibility to MCB, neither course is required, and so neither should hinder the establishment of the MCB major.

8. Anticipated funding needs and source of funds.

The funds to run the MCB program will come from internal reallocations within the standing budget for the School of Biological Sciences. All of the required courses are currently staffed, and so no new funds are required to initiate the program. The personnel budget from the BMB program has been reallocated, being split equally between the School of Biological Sciences, in support of the MCB major, and the Dept. of Chemistry. See Financial Implication Form for details.

9. **No** **Does this program count for teacher education?**

10. **No** **Is this an Interdisciplinary Studies program?**

11. **The following questions must be answered.**

Yes Have you confirmed that Milner Library has sufficient resources for the proposed program?

No Are more than 124 hours required to complete a degree with this major?

No Beyond General Education, does the major require more than 76 semester hours?

No Does this B.A., B.S., B.E.Ed. require more than 55 semester hours of major courses?

Yes Does this program stipulate specific general education courses offered in the major department/school as a part of the major requirements only if such courses serve as prerequisites for other courses required by the major?

Explain why specific general education courses are required.

Inner Core courses BSC 196/197 and CHE 140 (basic biology and chemistry) are necessary prereqs for other courses in the MCB requirements.

No Is the proposed program intended to be longer than four years (as indicated by the plan of study)?

Yes Have letter(s) of concurrence from affected departments/schools been obtained?
A departments/school is affected if it has a program with significant overlap or if it teaches a required or elective course in the program.

12. Routing and action summary for New Program:

1. Biological Sciences Department Curriculum Committee Chair

Martha Cook (website)	Martha Cook	9/16/2011 8:51:25 AM
Signature	Print	Date

2. Biological Sciences Department Chair/School Director

Craig Gatto (website)	Craig Gatto	9/19/2011 10:57:48 AM
Signature	Print	Date

3. College of Arts & Science College Curriculum Committee Chair

Todd Stewart (website)	Todd Stewart	9/28/2011 3:40:21 PM
Signature	Print	Date

4. College of Arts & Science College Dean

Sally Parry (website)	Sally Parry	9/28/2011 4:24:52 PM
Signature	Print	Date

5. University Curriculum Committee Chair

Jean Standard (website)	Jean Standard	11/3/2011 4:22:32 PM
Signature	Print	Date

All new programs (majors, minors, sequences) are routed by the U.C.C. to the Academic Senate