

Request to Approve BI 406 (Advanced Cell Biology) for Graduate Credit

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(13) New Course Proposals must include the following:

(a) Bulletin description:

(i) Give course number, title, credit hours, and any prerequisites either hidden or stated.

BI 406 Advanced Cell Biology 4 cr. (3-0-3)

Prerequisites: BI 111, BI 218 or CH 450, and CH 220 or CH 321; junior standing; or permission of the instructor.

Structure and function of eukaryotic cells and organelles, with comparisons to selected features of prokaryotic cells. Topics include methods of study, compartmentalization of cells, cellular energetics, cell signaling, cytoskeletal proteins, and the cell cycle. Laboratory work includes microscopy, tissue culture, and isolation of cellular components.

Note: the course as described above has been approved by the Committee on Undergraduate Programs and will be offered Winter 2008.

(ii) Hidden prerequisite refers to a required course that has one or more prerequisites itself. In such cases the Bulletin description must make this clear.

The bulletin description above was approved by the Committee on Undergraduate Programs and the Registrar.

(iii) If title is more than 20 characters, how will it be abbreviated on transcripts and other computer printouts?

Adv Cell Biol

(iv) If a course is to be graded on S/U or S/F basis, this must be stated.

The course will be graded A-F, not S/U or S/F

1. A grade of U (Unsatisfactory) is the equivalent of no credit.
2. A grade of P (Pass) is used only in student teaching.
3. S/U or S/G grades basis can be used only if the entire class is graded in the same fashion and the Bulletin carries this notation.
1. State which track the new course will fit into if this is relevant to the program.

Not applicable

2. Is the course a requirement or an elective?

Elective

(i) Why is there a need for this new course?

Graduate students with an interest in cell or molecular biology have been able to select from courses in molecular biology, biochemistry, and physiology. However, NMU does not currently offer a course in cell biology for graduate credit. This course will offer those students an option to study cell structure and function.

(ii) Show how the proposal fits into the overall program.

This course will be an elective at the 400 level that graduate students in Biology may take to meet their graduation requirements.

(iii) How does this course align with the program mission statement?

The Biology Department Mission statement is provided below. The new course will enhance our mission by allowing graduate students pursuing the Master of Science degree to increase their understanding of cell structure and function.

The mission of the Biology Department takes its direction from the mission of the University. The specific portions of the University mission statement (1996-1998 Undergraduate Bulletin) which provide direction to the Department are reproduced below:

The university will be predominantly an undergraduate institution, emphasizing a core of liberal arts programs and professional degrees that build on that core.... The university shall offer selected master's degree programs and continue its special role in teacher education, continuing education, and public service. For the region it shall serve as the major educational, economic, cultural, and recreational resource.

The Biology Department contributes to the mission of the University by offering:

1. Undergraduate biology programs appropriate for a regional, state supported university, which meet the needs of the students we serve.
2. A major in Biology for the secondary education curriculum.
3. Courses to support professional and Liberal Arts degree programs in other departments, and Liberal Studies courses for all students at the University.
4. A program of graduate study which awards the Master of Science Degree.

(iv) A corrected copy of the appropriate Bulletin showing curricula modifications can be helpful in many cases.

See above.

(i) Why did you choose this level for the course?

The course number was selected as a 400-level course because of the background students need to understand the topics discussed in the course, and also to reflect the complexity of material that will be covered. Material will be covered at a level comparable to other 400-level courses in the Biology Department. This course is a revision of BI 313 (Cell Biology). However, students in BI 406 will have completed either BI 218 (Introduction to Cell and Molecular Biology) or CH 450 (Introductory Biochemistry). This background will allow topics to be analyzed in more depth in BI 406. Offering the course at the 400 level also allows graduate students the opportunity to add a formal class in cell biology to their program.

(ii) How does it fit in with your department's philosophy for what decides the characteristics of each course level?

As noted above, material will be covered at a level comparable to other 400-level courses in the Biology Department. The difficulty of the revised course will be comparable to those courses, as are the number of prerequisites required to enroll in the course.

(i) Purely lecture courses are calculated on the basis of one credit for each academic hour a week for a course that lasts for a full semester.

See bulletin description above.

- (ii) Laboratories and discussions are ordinarily calculated on the basis of two academic hours for each hour of credit, although occasionally the ratio has been 3:1. A rationale must be provided for other than 2:1 ratios.

See bulletin description above.

- (iii) For internships and workshops, the basic principle has been that a full time work load for a student should be 40 hours a week, including both class time and preparation outside of class. Thus if a student putting in a total of 20 hours per week for the entire semester in an internship could earn 8 credits (half of a 16 hour, full load) Additional credit could be granted for an extensive term paper or other work done outside of the internship or workshops.

Not applicable

(b) Rationale:

The Department of Biology introduced a new course, BI 218 (Introduction to Cell and Molecular Biology) in Winter 2003. BI 218 provides a general introduction to the structure and function of cells, and also provides information on gene structure, gene regulation, and recombinant DNA techniques. Since some of the material now covered in BI 218 overlaps with that previously covered in BI 313 (Cell Biology) the Biology Department had deleted BI 313 and replaced it with a more advanced cell biology course, BI 406. Students taking BI 406 will have more background, since they will have taken either BI 218 or CH 450. This will allow us to cover some topics in more detail, and to include topics not covered in BI 313. This change should not require significant curricular modifications. Since we are now offering the course at the 400 level, we wish to make it available to graduate students.

(c) Course Number: **BI 406**

(d) Course Credits: **4 credits**

(e) Course outline: Include a one or two page outline of the course. Duplication with other courses offered by your own or other departments should be avoided. Written statements of support can be useful to demonstrate this.

A copy of the course syllabus is provided.

(f) Course Objectives: Appropriate graduate level course objectives must be provided. If the course is a 400-level course, both undergraduate and graduate objectives must be presented and differentiate the level of the expected outcomes.

Undergraduate Course Objectives

Upon successful completion of this course, students will have an understanding of the structure and function of eucaryotic cells and be able to explain the key ways in which eucaryotic cells differ from bacteria and archaea. Building upon prior courses in biology and chemistry, students will learn how the macromolecules within cells interact to bring about the key characteristics of life, including movement, replication, and communication. Students will learn how different experimental techniques are used to investigate and visualize cells.

Graduate Course Objectives

In addition to meeting the undergraduate objectives above, graduate students will: 1) be able to analyze primary research literature in cell biology; 2) will have a deeper understanding of experimental techniques than that expected for undergraduates, including being able to develop an experimental plan to answer new questions in cell biology; and 3) will be able to apply the general principles taught in the course towards understanding an area of cell biology not covered in the course. Graduate students will make one or more oral presentations to the class during the semester to demonstrate their knowledge of cell biology and will prepare a review paper about a topic in cell biology that was not covered in class. They will also be assigned problem sets based on scientific literature to assess their knowledge of principles of cell biology as well as their understanding of experimental techniques.

(g) Staffing: The proposal should be reviewed in relationship to staffing. If present staff will be assigned, list their names and expertise in the subject area. If new members are needed, also include evidence as to administrative support of necessary increased expense. Also keep in mind that course offered for graduate credit must be taught by individuals who have approval as graduate faculty.

The course will be offered each Winter semester and will be taught by Dr. John Rebers

(h) Equipment and supplies: List new budgetary needs, both to initiate the course and to support it on a regular basis. Is there administrative support?

Current equipment is adequate for teaching the course. The supply budget is expected to be comparable to that for teaching BI 313 (Cell Biology). The course has been approved at the undergraduate level, and no significant additional costs are anticipated to offer the course to graduate students.

(i) Library and required readings: A statement of present library holdings as they relate to the needs of the course should be included; note how current library holdings are. If the major source of information will be texts or other materials, these should be listed. A bibliography is not needed if the preceding questions have been effectively answered. Consultation with the Collection Department Librarian is encouraged.

Present library holdings should be adequate for this course, and the recent trend to making more journals available on-line will facilitate readings for discussions in the course. Additional laboratory manuals in Cell Biology would help students prepare for independent lab work, which will be a component of the BI 406 laboratory. The library has been contacted and feels that purchase of extra lab manuals is reasonable.

(j) Costs: Give a summary of the projected additional costs for the course, Be careful, the answer that no new resources will be needed is usually misleading and does not clarify how the course will be funded or staffed.**

No additional costs are anticipated. Since this course is replacing BI 313, no additional staffing is required. As noted above, the supply budget for BI 406 should be comparable to that for BI 313.

(k) Effects on Other Departments: The effect of the proposal on other departments should be discussed. It is the proposing department's responsibility to initiate discussion with other departments that might have interests in this area. Attach statements from departments affected by the proposal.

When BI 406 was approved as an undergraduate course, the Departments of Chemistry, Clinical Lab Sciences, and Health, Physical Education, and Recreation were contacted and provided letters of support. Approving BI 406 for graduate credit will not affect graduate programs in other departments.

(l) Deletion of Courses: **When a department adds courses, it should seriously consider deleting an equivalent number of courses at the same time, or at least be prepared to explain how it can teach the new courses plus the old.

BI 313 was deleted at the time that BI 406 was approved for undergraduate credit.

(m) Implementation Date: When is the proposal to be put into effect? This should be clarified, especially if the aim is to have an early implementation date

The Biology Department would like to put this proposal in effect for Winter, 2008.