

UM-Missoula
2007-2008 PROGRAM YEAR

THE MONTANA UNIVERSITY
SYSTEM CAMPUS REPORTS

LIST OF THE PROGRAMS REVIEWED

- 1. Division of Biological Sciences**
- 2. Economics**

Program Name(s): **Division of Biological Sciences**

B.A. degree. Option in Biological Education
 B.A. degree, Option in Botanical Sciences
 B.A. degree, Option in Cellular & Molecular
 B.A. degree, Option in Ecology
 B.A. degree, Option in Human Biological Sciences
 B.A. degree. Option in Natural History
 B.A. degree, Option in Zoological Sciences
 M.S. degree in Biochemistry
 Ph.D. in Microbial Ecology
 Ph.D. In Microbiology and Biochemistry, Integrative
 B.S. degree, Option in Microbial Ecology
 B.S.M. in Microbiology
 M.S. degree in Microbiology
 M.S. degree, Option in Microbial Ecology
 M.S. in Organismal Biology & Ecology
 Ph.D. in Organismal Biology & Ecology

Programs fall into the category described in Section E. of Policy 303.3:
 See Directions Page for additional information to complete this section.
 Use blue fields to add text.

Yes Add information here [see Table below]

No Add information here

Decision(s) concerning the future of the program(s), based on the program review criteria established at the campus:

In response to recommendations during the Program Review process, the following list of programs is being modified: some are being combined, others eliminated, others renamed. Level I and Level II proposals are under campus review and will be submitted to the BOR for approval at the completion of campus approvals.

B.A. degree. Option in Biological Education
 B.A. degree, Option in Botanical Sciences
 B.A. degree, Option in Cellular & Molecular
 B.A. degree, Option in Ecology
 B.A. degree, Option in Human Biological Sciences
 B.A. degree. Option in Natural History
 B.A. degree, Option in Zoological Sciences
 M.S. degree in Biochemistry
 Ph.D. in Microbial Ecology
 Ph.D. In Microbiology and Biochemistry, Integrative
 B.S. degree, Option in Microbial Ecology

B.S.M. in Microbiology
 M.S. degree in Microbiology
 M.S. degree, Option in Microbial Ecology
 M.S. in Organismal Biology & Ecology
 Ph.D. in Organismal Biology & Ecology

Degree	Field/Major	Option	FY05	FY06	FY07	avg
Bachelor of Arts	Biology		5	1	1	3
Bachelor of Arts	Biology	Biological Education	8	6	4	6
Bachelor of Arts	Biology	Botanical Sciences	8	4	4	5
Bachelor of Arts	Biology	Cellular & Molecular Bio	4	1	3	3
Bachelor of Arts	Biology	Ecology	16	16	7	13
Bachelor of Arts	Biology	Human Biological Sci	40	28	35	34
Bachelor of Arts	Biology	Natural History	1	4	4	3
Bachelor of Arts	Biology	Zoological Sciences	11	10	6	9
Master of Science	Biochemistry		1	1	1	1
Doctor of Philosophy	Integrative Micro & Biochem			1		
Doctor of Philosophy	Biochem/Microbiology		5	1		2
BA in Microbiology	Microbiology					
BS in Microbiology	Microbiology		15	7	15	12
BS in Microbiology	Microbiology	Ecology			1	
BS in Microbiology	Microbiology	Microbial Ecology	1	2	1	1
Master of Science	Microbiology		1	1		1
Master of Science	Microbiology	Microbial Ecology			2	1
Master of Science	Organismal Biol & Ecol		1	1	5	2
Doctor of Philosophy	Organismal Biol & Ecol		7	3	5	5

Rationale or justification for the decision based on the program review process established at the campus. (Note: If the program(s) fall(s) into the category described in Section E, this part of the report must be more complete and detailed if the campus decision is to retain or continue the program.

The programs in the Division of Biological Sciences attract a large number of undergraduate and graduate majors (see Table above for graduation data). The Department contributes to the undergraduate mission of the University by enrolling approximately 500 FTE each fall semester and generating approximately 7900 SCHs.

The Divisions overall goal is “to deliver high-quality academic programs in the biological sciences. The Division’s mission includes educating students at all levels from the baccalaureate to the doctoral, so that they develop the knowledge, skills, and attitudes to succeed as professional biologists and as citizens in a rapidly changing world facing challenges and opportunities that include significant biological components; to foster strong research programs that create new knowledge, understanding, and approaches in biology and that enhance the learning environment for students; and to apply biological science to benefit the university, state, region, nation, and the world.” Specific goals include:

1. Have a fundamental knowledge and conceptual understanding of biology
2. Integrate knowledge and concepts across biological sub-disciplines and cognates
3. Learn skills required of a modern biologist
4. Understand the conduct of science and adopt the scientific method
5. Critically think and evaluate scientific data and evidence
6. Develop careers and a lifelong education process

The Division prides itself on the commitment of its faculty to excellent teaching. The annual faculty review process allows for and encourages merit increases based on exceptional teaching performance and innovation as well as the more usual research-based criteria. At the undergraduate level, DBS has been the recipient of two large programmatic grants to enhance curriculum and expand entry to mentored undergraduate research. Faculty have committed to updating instructional methods and content in large undergraduate courses to incorporate active learning techniques. Graduate student training has also included a significant outreach component, with quite a few of the students participating in the ECOS program, funded by an NSF GK-12 education grant, to integrate science research into grade school curricula (www.bioed.org/ecos).

Program Name(s) Economics

B.A. degree. Option in Biological Education
B.A. degree, Option in Botanical Sciences
B.A. degree, Option in Cellular & Molecular
B.A. degree, Option in Ecology
B.A. degree, Option in Human Biological Sciences
B.A. degree. Option in Natural History
B.A. degree, Option in Zoological Sciences
M.S. degree in Biochemistry
Ph.D. in Microbial Ecology
Ph.D. In Microbiology and Biochemistry, Integrative
B.S. degree, Option in Microbial Ecology
B.S.M. in Microbiology
M.S. degree in Microbiology
M.S. degree, Option in Microbial Ecology
M.S. in Organismal Biology & Ecology
Ph.D. in Organismal Biology & Ecology

A d d e n d u m

Note: Duplicate this page for program(s) reviewed.

Self-study prepared—January 2008 by Dr. Charles Janson (Associate Dean)

External reviewers visited campus—April 3-4, 2008

Dr. Virginia Miller (Washington University School of Medicine), Dr. Doug Futuyma (University of New York—Stony Brook), and Dr. Dan Arp (Oregon State University) met with department faculty, emeritus faculty, affiliated faculty in other departments, undergraduates, graduates, Dean of Arts and Sciences Gerald Fetz, Dean of the Graduate School David Strobel, Associate Provost Arlene Walker-Andrews, and Provost Royce Engstrom during the visit.

Report received from external reviewer—April 22, 2008

Summary paragraph: The University of Montana is fortunate to have a truly excellent faculty in the biological sciences. In both IMB and OBE, most if not all faculty members are clearly dedicated to excellence in education, and in research, both groups shine. Almost all faculty members have research funding, chiefly from NIH and NSF, at levels that are at part or above for their discipline, and are active in publishing in first-rate journals. (The representation in the highly visible outlets *Nature*, *Science*, and *PNAS*, may, in fact, be exceptional on a per capita basis.) Some have won exceptional funding, such as a recent NSF Career Award to an assistant professor. Moreover, Division faculty have taken unusual initiative in obtaining funding for education as well. Especially notable are an IGERT program (Montana—Ecology of Infectious Diseases) that is administratively housed in DBS and includes faculty from the Mathematics, Computer

Sciences, and Wildlife Biology departments as well; the MILES (Montana Integrative Learning Experience for Students) program, funded by the Howard Hughes Medical Institute, and the NSF-funded EPSCoR program focused especially on the ecology of river ecosystems. Faculty have initiated and sustained the construction of a superb research facility (the Field Research Station) at Fort Missoula. Of special note is the Flathead Lake Biological Station, the faculty of which are in OBE, although the Director reports to the Vice-President for Research. Under the Director's leadership, this unit has obtained significant funding from Congressional, State, and other sources, plays a major role in research on Montana's aquatic ecosystems and fisheries, offers nationally recognized summer field course, and supports a number of graduate students. Not surprisingly in view of their excellence, a substantial number of DBS faculty members have turned down offers from other universities, some quite prestigious. In all, this is a faculty that is dedicated to research and education, in sometimes challenging circumstances. We were uniformly impressed with the dedication to undergraduate education among the faculty at all levels. Of note, a relatively small faculty are trying to cover a very diverse set of topics in the biological sciences. There was some concern raised by the review committee that the attempt to address the needs of so many options is stretching the faculty too thin and that indeed this really might not be necessary at the undergraduate level (overspecialization). Consolidating some of these options and providing elective course options instead possibly could provide more flexibility in the use of faculty teaching time. This seems particularly worth considering as several of these options routinely have just a [few] graduates each year.

Graduate Council review—received April 29, 2008

Commendations sent to the department faculty, including:

1. The faculty have strong research programs, as demonstrated by the number of active grants, the number of publications, and their record of publishing in the most prestigious journals. The outside referees suggested that the "representation in the highly visible outlets *Nature*, *Science*, and *PNAS* may, in fact, be exceptional on a per capita basis." The faculty of DBS is, in short, outstanding.
2. Faculty members collaborate with colleagues in DBS and other UM departments, publishing together frequently.
3. Undergraduates receive an excellent education in the Biological Sciences, and they progress through the program in a timely fashion.
4. Graduate students are of high caliber; and they are enthusiastic and engaged.

Recommendations (to be discussed and refined). The Division needs to consider:

1. Development of a Strategic Plan inclusive of both the Integrative and Molecular Biology and Organismal Biology and Evolution programs, as well as the Division as a whole.
2. Consolidation of undergraduate options for majors in Biological Sciences.
3. Development of core courses and formal and informal mechanisms for greater interaction among graduate students and faculty across and within the two programs. The external reviewers made several suggestions for appropriate mechanisms.
4. Work with the administration to clarify the duties, responsibilities, and status for the title "Research Professor" in the Division.
5. Development of a clear plan for how space needs will be met as the new building comes online.

6. Discussion with the Administration about the critical issues of graduate assistantships and tuition costs.

Department Chair conference with Provost and Associate Provost—Scheduled for October 30, 2008

Department Chair and Provost complete joint action plan—in preparation

Program Name(s): **Economics**

Bachelor of Arts degree in Economics
 M.A. degree in Economics

Programs fall into the category described in Section E. of Policy 303.3:
 See Directions Page for additional information to complete this section.
 Use blue fields to add text.

- Yes Add information here
- No Add information here [see Table below]

Decision(s) concerning the future of the program(s), based on the program review criteria established at the campus:

Bachelor of Arts degree in Economics: Retain the program as is
 Minor in Economics: Retain the program as is
 M.A. degree in Economics: Retain the program as is

<u>Degrees Conferred</u>	Bachelor's				Master's			
	FY2006	FY2007	FY2008	Average	FY2005	FY2006	FY2007	Average
TOTAL	17	11	7	11.6	2	2	1	1.67
Primary Majors					2	2	1	1.67
Economics	17	11	7	11.6				

Rationale or justification for the decision based on the program review process established at the campus. (Note: If the program(s) fall(s) into the category described in Section E, this part of the report must be more complete and detailed if the campus decision is to retain or continue the program.

In Fall of 2007, the Department of Economics enrolled 52 undergraduate majors and 11 graduate majors. They graduate about 12 undergraduate majors each year. The number of graduate degrees awarded ranges from 1 to 2 each year (see Table above).

The Department contributes to the undergraduate mission of the University by enrolling approximately 250 FTE each fall semester and generating approximately 3700 SCHs.

The Department's overall goal is "to provide an educational experience that leads our students to knowledge and critical understanding of social phenomena from an economic perspective. Students will understand the workings of markets, the advantages and limitations of government intervention in markets, and the basic issues of microeconomics (household and commercial firm decision making) and macroeconomics (the role of economy-wide aggregates). Students will have the ability to apply appropriate economic models to real world situations and to evaluate critically basic economic analyses. They will be able to formulate a basic research agenda and know how to access the professional economics literature and commonly used economic databases. Students must also be able to express themselves in a clear and articulate way both verbally and in writing. In addition, they need to be able to work cooperatively with other professionals in problem solving."

The Department provides students with opportunities for internships, service learning, debate/forensics, participation in Lambda Pi Eta (Honor Society), Honors coursework, research, and closely supervised teaching opportunities.

At the graduate level, students are prepared for doctoral study (approximately 40% pursue a doctoral degree upon leaving UM) and non-academic careers.

Program Name(s) Economics

Bachelor of Arts degree in Economics

Minor in Economics

Master of Arts degree in Economics

A d d e n d u m

Note: Duplicate this page for program(s) reviewed.

Self-study prepared—April 2007 by Dr. Thomas M. Power (Chair)

External reviewer visited campus—October 18-19, 2007

Dr. John Fitzgerald, Bowdoin College, met with department faculty, emeritus faculty, affiliated faculty in other departments, undergraduates, graduates, Dean of Arts and Sciences Gerald Fetz, Dean of the Graduate School David Strobel, Associate Provost Arlene Walker-Andrews, and Provost Royce Engstrom during the visit.

Report received from external reviewer—November 15, 2007

Summary paragraph: The Economics Department at the University of Montana provides a solid education for its students based on a well structured curriculum. The graduate program produces masters students capable of contributing to applied research that benefit the state and beyond. The faculty members are dedicated to the welfare of their students and are a supportive community of scholars with varied research interests. All of these features contribute to my belief that the department is in good shape. Recent retirements and those that are likely to occur in the next few years mean that the department is in transition. The department has a unique strategic opportunity to build a focused area of strength moving forward with its young faculty. The department has bright and exciting prospects.

Graduate Council review—received February 14, 2008

Commendations sent to the department faculty, including:

1. The “collegiality of the department is strong.” An impressive commitment from the chair, dedicated faculty, and a “highly competent” support staff result in an effective and successful program.
2. Undergraduates are “well served” by the department, particularly in regard to the senior thesis which teaches them valuable skills for the job market and provides them with the opportunity to develop a close working relationship with faculty. In addition, the thesis also serves as an indispensable assessment tool, which the department has effectively

used to measure student comprehension of the curriculum's goals and to make adjustments and improvements to the program as a whole.

3. The Graduate program is healthy and thriving, with students "having no trouble finding jobs,...some being lured away before completion of the program." It also allows access to undergraduates who benefit from the graduate courses and interaction with graduate students.

Recommendations (to be discussed and refined). The Department needs to consider:

1. Fully developing and strengthening its communication and collaboration with the College of Forestry & Conservation, and in particular, with the School of Business Administration.
 - a. With Forestry, the department should prevent the overlapping of Economics courses to save time and resources for both programs.
 - b. The chasm between the department and the SOBA appears to be rather detrimental to Economics students who are uninformed regarding recruiters and job fairs, or have difficulty in discovering or accessing relevant Business courses. In addition, Business majors are under the impression that the content of Economics courses are not applicable or valuable to them – and due to strictness of their own set coursework, do not have enough warning to accommodate an Economics class in their schedule.
2. An increased focus on the publication of graduate students' theses. This will benefit not only the student, particularly those going on to the Ph.D., but the faculty and the department, as well.
3. A long-range plan for its future in regard to the hiring of three faculty members and the retirement of current senior members. Research areas to be emphasized, hiring new or experienced faculty in an already young department, and the mentoring of new faculty are all areas to be carefully examined.
4. In light of the small number of graduate students in the program, the opportunities for students to find employment after obtaining a degree, and the benefits for undergraduates in interacting with graduate students, the department should consider what size is optimal for the graduate program and implement strategies to attain that size.

Department Chair conference with Provost and Associate Provost—Scheduled for October 30, 2008

Department Chair and Provost complete joint action plan—in preparation