

# Department of Biology



## Overview of 2010 Biology Curriculum Proposals:

The Biology Department at The University of Montana Western (UMW) is proposing to restructure its degree offerings. It currently offers a Bachelor of Arts degree (B.A.) with a Biology Option and six associated Related Areas (Sub-Options) in: Biological Mathematics; Cell/Molecular Biology; Health and Human Performance; Pre-professional Health Sciences; Veterinary Science; and Wildlife Biology. Montana Western is proposing to eliminate the B.A.: Biology Option and its six associated Related Areas and replace it with a Bachelor of Science Major (B.S.) in Biology with three Options: Molecular Bioscience; Wildlife Ecology; and Integrative Biology. The new Bachelor of Science Major will allow the UMW Biology Department to more effectively meet the needs of its students as it will eliminate redundancy in the current biology program, it is a more appropriate degree for our students and it is easier to explain to prospective students.

This proposal is simply to reduce the redundancy among Related Areas in our existing biology program, and is therefore not a new program but a repackaging of an existing program. Although all four-year institutions within the MUS offer a Biology Major, UMW is the only institution in the MUS that offers a Biology program on block scheduling. Based on recent enrollment data, this unique learning system is proving to be an attractive option for an ever-increasing subset of the MUS student clientele. UMW biology faculty believe that the Bachelor of Science Major that is proposed is the most effective way for UMW to meet the needs of students that are interested in the block system and want to pursue careers in Biology. All of the biology courses in the current and proposed biology programs are listed in the MUS transferability matrix, so students can easily transfer from UMW to and from other MUS institutions. In addition, the inherent flexibility of the Integrative Biology Option in our proposed Major would greatly benefit those students wishing to transfer to UMW from larger institutions where they may have taken more specialized biology courses.

### EXISTING PROGRAM:

B.A. Option: ~~Biology~~

Related Areas:

1. ~~Biological Mathematics~~
2. ~~Cell/Molecular Biology~~
3. ~~Health and Human Performance~~
4. ~~Pre-professional Health Sciences~~
5. ~~Veterinary Science~~
6. ~~Wildlife Biology~~

### PROPOSED PROGRAM:

B.S. Major: Biology

Option Areas:

1. Wildlife Ecology
2. Molecular Bioscience
3. Integrative Biology



**Academic Year Proposal Submitted** 2010/2011  
 For: \_\_\_\_\_ Catalog



**Date Received** \_\_\_\_\_  
**By** \_\_\_\_\_

Level I - Campus Level Approval  
 Level II - OCHE Approval  
 Level III - BOR Approval

## Curriculum Proposal Form

Department or Program Approval  
 Date \_\_\_\_\_ Initials \_\_\_\_\_

General Education Committee (if appropriate)  
 Date \_\_\_\_\_ Initials \_\_\_\_\_

**Proposed as Gen Ed Course?** Yes  No

**Gen Ed Category:**

**Course Fee Attached to Any Course?**

No  Yes (Completed Course Fee Request Form attached)

If course Number/Name with Lab Fee is changing, previous course Number/Name:

**Curriculum Committee Use Only**

Proposal Tabled \_\_\_\_\_  
*Date Initials*

Approved \_\_\_\_\_  
*Date Initials*

Rejected \_\_\_\_\_  
*Date Initials*

Withdrawn \_\_\_\_\_  
*Date Initials*

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Faculty Senate Approval \_\_\_\_\_  
*Date Initials*

Provost Approval \_\_\_\_\_  
*Date Initials*

Chancellor Approval \_\_\_\_\_  
*Date Initials*

**Type of Proposal (check all that apply)**

<input type="checkbox"/> Program Requirement Change <input type="checkbox"/> Course Number Change <input type="checkbox"/> Course Title Change <input type="checkbox"/> Course Credit Change <input type="checkbox"/> Course Description Change <input type="checkbox"/> Prerequisite Change <input type="checkbox"/> Delete Course from Catalog <input type="checkbox"/> New Course	<p style="text-align: center;"><b>For Curriculum Committee Use Only:</b></p>          
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X Other (describe): Repackaging of the current BA: Biology Option degree and Related Areas in Biological Mathematics, Cell/Molecular Biology, Health and Human Performance, Pre-professional Health Sciences, Veterinary Science and Wildlife Biology. The BA Option in Biology and Related Areas will go into moratorium.

Submitted by: Morrow  
 Department (Program) contact person: Morrow

**Succinct Statement of Proposed Change:** (attach shell syllabus for new course(s) that includes course description, course outcomes, and assessment information/tools)

Currently, students may seek the BA: Biology Option with one of the following Related Areas, Biological Mathematics, Cell/Molecular Biology, Health and Human Performance, Pre-professional Health Sciences, Veterinary Science and Wildlife Biology.

The Biology Department proposes to repackage these degrees into a single B.S. Biology degree with three associated option areas, Wildlife Ecology Option, Molecular Bioscience Option and Integrative Biology Option.

**Provide assessment information supporting the request (rationale):**

The existing B.A. Degree with an option in Biology (and its associated related areas) is out of compliance with the standards for B.A. Degrees in the Montana University system. This proposal repackages these degrees and related areas into a MUS standards-compliant B.S. Degree with options. No new courses are needed for this change. In addition, this restructuring constitutes a simplification of the Biology Department's degree offerings. We are reducing the number of degrees by replacing six related areas (Biological Mathematics, Cell/Molecular Biology, Health and Human Performance, Pre-professional Health Sciences, Veterinary Science and Wildlife Biology) with the three options in Wildlife Ecology, Molecular Bioscience, and Integrative Biology. This simplification should make the degree offerings of the Department of Biology more transparent to students, and will be much easier for our Admissions Department to explain to prospective students.

**Attach new or revised information as it should appear in the Catalog (include course rotation(s) and/or revised degree requirements, if applicable; course descriptions should include assessment and experiential learning activities)**

The new course summary for the B.S. Biology Major and its three options in Wildlife Ecology, Molecular Bioscience and Integrative Biology is attached at the end of this document.

**Transferability Considerations (if any):**

Since there are no new courses required for the restructuring of the Biology degrees, no transferability considerations are anticipated. However, the flexibility of our Integrative Biology Option area may actually help students transferring to Montana Western complete their Biology degree more quickly.

**Effects, if any, of this proposal on any of our degree programs.**

(Review other degree programs that may be potentially affected by this proposal; affected Dept Chair aware of possible implications)

NONE

**Resource Implications (if applicable):**

**STAFFING:**

Who will teach course(s)?

**This proposal introduces NO NEW COURSES, does not reduce general education requirements and does not require any additional staffing.**

Effect on faculty member's workload?

**OTHER (Library, etc.):**

**General Education Committee Comments (if appropriate):** Date \_\_\_\_\_

**All Chairs/Provost Comments (if appropriate):** Date \_\_\_\_\_

**Curriculum Committee Comments (if appropriate):** Date: \_\_\_\_\_

## BS: Biology

### General Education

BIOB 160 Principles of Living Systems	4
CHMY 141 College Chemistry I	4
STAT 121 Probability	4
Additional coursework to complete General Education Program requirements <sup>1</sup>	19-20
<b>General Education Credits</b>	<b>31-32</b>

<sup>1</sup>Refer to page ??? for General Education Program requirements

### Biology Core

BIOB 170 Principles of Biological Diversity	4
BIOO 220 General Botany	4
BIOB 260 Cellular & Molecular Biology	4
BIOE 370 Ecology	4
BIOB 375 General Genetics	4
BIOB 420 Evolution	4
BIOB or HPP 400/498 Internship/Senior Thesis	3
BIOB 495 Internship/Senior Thesis Presentation	1
CHMY 143 College Chemistry II	4
CHMY 321 Organic Chemistry I	4
CHMY 323 Organic Chemistry II	4
PHYS 233 General Physics	4
PHYS 234 General Physics	4
M 171 Calculus I	4
STAT 217 Intermediate Statistical Concepts or STAT 233 Biostatistics	4
<b>Biology Core Credits</b>	<b>56</b>

### Option

Select one Option <sup>2</sup>	24
Integrative Biology Option Molecular Bioscience Option Wildlife Ecology Option	
<b>Option Credits</b>	<b>24</b>

### Electives

Select from any catalog courses	12-13
<b>Elective Credits</b>	<b>12-13</b>

**TOTAL CREDITS REQUIRED**

**120**

In addition to completing the Core, students pursuing the BS Biology major must choose an Option: Integrative Biology, Molecular Bioscience, or Wildlife Ecology. Refer to Option required coursework below:

### Integrative Biology Option

2 BIO elective course at the 200-400 level (only one may be 200 level)	8
4 elective courses at the 300 – 400 level <sup>1</sup>	16
<b>Total Credits</b>	<b>24</b>

<sup>1</sup> Courses taken from the following rubrics meet the elective course requirements of the Integrative Biology Option: BIO, CHMY, ENVS, EQST, GEO, HHP, MATH, PHYS, and STAT, or other course rubrics approved by a Biology advisor.

### Molecular Bioscience Option

BIOM 260 General Microbiology	4
BIOB 425 Advanced Cellular & Molecular Biology	4
CHEM 441 Biochemistry	4
<i>Select 3 from the following:</i>	12
BIOE 250 Conservation Biology (4)	
BIOO 340 Biology and Management of Fishes (4)	
BIO 371 Human Anatomy and Physiology (4)	
BIO 372 Human Anatomy and Physiology (4)	
BIOM 427 General Parasitology (4)	
BIOO 450 Vertebrate Zoology (4)	
BIO 471 Wildlife Ecology and Management (4)	
BIOB 487 Bioinformatics (4)	
M 414 Deterministic Models (4)	
STAT 335 Advanced Field Statistics (4)	
STAT 433 Stochastic Modeling (4)	
PHYS 235 General Physics III (4)	
<b>Total Credits</b>	<b>24</b>

### Wildlife Ecology Option

BIOE 250 Conservation Biology	4
BIOO 435 Plant Systematics	4
BIO 471 Wildlife Ecology and Management	4
Select 2 from the following:	8
BIOO 470 Ornithology (4)	
BIOO 475 Mammalogy (4)	
BIOO 340 Biology and Management of Fishes (4)	
Select 1 from the following:	4
BIOO 262 Introduction to Entomology (4)	
BIOO 340 Biology and Management of Fishes (4)	
BIOE 425 Wetlands Ecology (4)	
BIOB 425 Advanced Cellular & Molecular Biology (4)	
BIOM 427 General Parasitology (4)	
BIOO 450 Vertebrate Zoology (4)	
BIOO 470 Ornithology (4)	
BIOO 475 Mammalogy (4)	
M 414 Deterministic Models (4)	
STAT 335 Advanced Field Statistics (4)	
STAT 433 Stochastic Modeling (4)	

**Total Credits**

**24**

**The University of Montana Western**

**Course differences between the old B.A. Option in Biology and the proposed B.S. Major in Biology**

**New BS: Biology**

**Old BA: Biology Option**

**Gen Ed**

BIOB160 (old BIO111)	4	BIOB160	4
CHMY141 (old CHEM131)	4	CHEM141	4
STAT121 (old MATH121)	4	STAT121	4
Total	12	Total	12

**Core**

BIOB170 (old BIO112)	4	BIOB170	4
BIOO220 (old BIO214)	4	BIOO220	4
BIOB260 (old BIO255)	4	BIOB260	4
BIOE370 (old BIO477)	4	BIOE250 (old BIO270)	4*
BIOB375 (old BIO343)	4	BIOB375	4
BIOB420 (old BIO450)	4	BIOB420	4
CHMY143 (old CHEM132)	4	CHMY143	4
CHMY321 (old CHEM331)	4	CHMY321	4
CHMY323 (old CHEM332)	4		
PHYS233 (new PHSX220)	4	PHYS233	4
PHYS234 (new PHSX222)	4		
M171 (old MATH201)	4	M171	4
STAT217 (old MATH232)	4	STAT217 or STAT233	4
BIOB or HHP internship	3	BIOB or HHP internship	3
BIOB495 intern presentation	1	BIOB495	1
Total	56	Total	48

\* UMW Biology students are better served with a general ecology class as opposed to a conservation biology course. Therefore, this course was changed.

Organic Chem II (CHMY323) and physics II (PHYS234) were added as requirements because most graduate and professional programs in biological fields require these courses. These are currently requirements in some of our most popular related areas, so no new sections will need to be added. The addition of these courses will not affect course offerings or professor loads because they are both taught every year, and will not require new sections with current enrollments.

Currently, there are 6 Related Areas (Sub-Options) offered in association with the BA: Biology Option. The three new Options proposed for the new Biology Major (Integrative Biology, Molecular Bioscience and Wildlife Ecology) use no courses that are not currently required in the 6 related areas, so there will be no requirement for new resources.

The proposed Integrative Biology Option provides students with a wide range of flexibility to take nearly any science courses they are interested in and earn a Biology Major. This will significantly help transfer students in obtaining a biology degree from Montana Western. The proposed proposed allows students 12-13 credits of electives as opposed to the old degree which allowed for 0-22 electives depending on related area choice.

Finally, this Major is a B.S. Major, which requires a very prescribed set of courses to allow students the coursework to be marketable for biological careers, graduate and professional programs.