

# BACHELOR OF SCIENCE in BIOLOGY

Revised 10/08 MDW

## Molecular Biology Option

*Concepts in Biology I* (50-114) and *Concepts in Biology II* (50-115) should be taken during the freshman year; *Microbiology* (50-242) and *Cell Biology* (50-271) should be taken during the sophomore year. *Intro Physics I and II* can not be taken concurrently with *Cell Biology* or *Genetics*. A minimum of forty-one (41) credit hours in biology is required. In addition to the 30 credit hours of required courses listed on this page, the student must select 11 credit hours of elective courses in biology.

Chemistry and mathematics courses should be scheduled as early as possible in the program of study. Required courses in chemistry, physics and mathematics fulfill the Natural Science and Mathematics general education requirement. *Basic Statistics* (48-160) may be substituted for *Introduction to Statistics* (53-141).

<p><b>Biology Core Requirement</b> (30 cr hrs) <input type="checkbox"/></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>50-114</td><td>Concepts in Biology I</td><td style="text-align: right;">4</td><td><input type="checkbox"/></td></tr> <tr><td>50-115</td><td>Concepts in Biology II</td><td style="text-align: right;">4</td><td><input type="checkbox"/></td></tr> <tr><td>50-242</td><td>Microbiology</td><td style="text-align: right;">4</td><td><input type="checkbox"/></td></tr> <tr><td>50-271</td><td>Cell Biology</td><td style="text-align: right;">4</td><td><input type="checkbox"/></td></tr> <tr><td>50-332</td><td>Genetics</td><td style="text-align: right;">3</td><td><input type="checkbox"/></td></tr> <tr><td>50-333</td><td>Molecular Biology</td><td style="text-align: right;">3</td><td><input type="checkbox"/></td></tr> <tr><td>50-445</td><td>Methods in Biotechnology</td><td style="text-align: right;">3</td><td><input type="checkbox"/></td></tr> <tr><td>50-481</td><td>Senior Biology Seminar</td><td style="text-align: right;">1</td><td><input type="checkbox"/></td></tr> </table> <p><b>Physiology Requirement</b> (Select 50-479 AND one lecture course from among 50-472, 50-474, 50-477, 50-478, and 50-480.)</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>50-479</td><td>Integrated Physiology Lab*</td><td style="text-align: right;">1</td><td><input type="checkbox"/></td></tr> </table> <p><b>AND</b> * Scheduled concurrently with physiology lecture course.</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>50-472</td><td>Animal Cell Physiology</td><td style="text-align: right;">3</td><td><input type="checkbox"/></td></tr> <tr><td>50-474</td><td>Human Physiology</td><td style="text-align: right;">3</td><td><input type="checkbox"/></td></tr> <tr><td>50-477</td><td>Plant Physiology</td><td style="text-align: right;">3</td><td><input type="checkbox"/></td></tr> <tr><td>50-478</td><td>Microbial Physiology</td><td style="text-align: right;">3</td><td><input type="checkbox"/></td></tr> <tr><td>50-480</td><td>Comparative Animal Phys</td><td style="text-align: right;">3</td><td><input type="checkbox"/></td></tr> </table> <p>** 50-444 (Tissue Culture) may substitute for IPL for declared Molecular Biology Option students. It may not substitute and also count as a biology elective.</p> <p><b>Biology Elective Requirement</b> (11 cr hrs)                  Select 11 cr hrs of biology electives listed on p. 2                  Other biology electives selected are counted as free electives.</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>50-_____</td><td>_____</td></tr> <tr><td>50-_____</td><td>_____</td></tr> <tr><td>50-_____</td><td>_____</td></tr> <tr><td>50-_____</td><td>_____</td></tr> </table>	50-114	Concepts in Biology I	4	<input type="checkbox"/>	50-115	Concepts in Biology II	4	<input type="checkbox"/>	50-242	Microbiology	4	<input type="checkbox"/>	50-271	Cell Biology	4	<input type="checkbox"/>	50-332	Genetics	3	<input type="checkbox"/>	50-333	Molecular Biology	3	<input type="checkbox"/>	50-445	Methods in Biotechnology	3	<input type="checkbox"/>	50-481	Senior Biology Seminar	1	<input type="checkbox"/>	50-479	Integrated Physiology Lab*	1	<input type="checkbox"/>	50-472	Animal Cell Physiology	3	<input type="checkbox"/>	50-474	Human Physiology	3	<input type="checkbox"/>	50-477	Plant Physiology	3	<input type="checkbox"/>	50-478	Microbial Physiology	3	<input type="checkbox"/>	50-480	Comparative Animal Phys	3	<input type="checkbox"/>	50-_____	_____	50-_____	_____	50-_____	_____	50-_____	_____	<p><b>Chemistry Requirement</b> (20 hrs) <input type="checkbox"/></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>52-115</td><td>Chem for the Sciences 1</td><td style="text-align: right;">4</td><td><input type="checkbox"/></td></tr> <tr><td>52-116</td><td>Chem for the Sciences 2</td><td style="text-align: right;">4</td><td><input type="checkbox"/></td></tr> <tr><td>52-230</td><td>Fund Organic Chemistry**</td><td style="text-align: right;">4</td><td><input type="checkbox"/></td></tr> <tr><td>52-341</td><td>Biochemistry</td><td style="text-align: right;">4</td><td><input type="checkbox"/></td></tr> <tr><td>52-442</td><td>Biochemistry 2</td><td style="text-align: right;">4</td><td><input type="checkbox"/></td></tr> </table> <p>**Spring semester only. If you are considering post-graduate education, please know that one course in organic chemistry may be insufficient. You are then advised to take 52-231 Organic Chemistry I AND 52-232 Organic Chemistry II</p> <hr/> <p><b>Physics Requirement</b> (8 cr hrs; select one pr) <input type="checkbox"/></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>54-111</td><td>Introductory Physics I***</td><td style="text-align: right;">4</td><td><input type="checkbox"/></td></tr> <tr><td>54-112</td><td>Introductory Physics II***</td><td style="text-align: right;">4</td><td><input type="checkbox"/></td></tr> </table> <p><b>OR</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>54-211</td><td>General Physics I</td><td style="text-align: right;">4</td><td><input type="checkbox"/></td></tr> <tr><td>54-212</td><td>General Physics II</td><td style="text-align: right;">4</td><td><input type="checkbox"/></td></tr> </table> <p>***May not be taken concurrently with Cell Biology.                  54-111 Fall only. 54-112 Spring only.</p> <hr/> <p><b>Mathematics Requirement</b> (6 cr hrs; select one pair) <input type="checkbox"/></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>53-123</td><td>Essentials of Calculus</td><td style="text-align: right;">3</td><td><input type="checkbox"/></td></tr> <tr><td>53-141</td><td>Introduction to Statistics</td><td style="text-align: right;">3</td><td><input type="checkbox"/></td></tr> </table> <p><b>OR</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>53-125</td><td>Calculus I</td><td style="text-align: right;">3</td><td><input type="checkbox"/></td></tr> <tr><td>53-141</td><td>Introduction to Statistics</td><td style="text-align: right;">3</td><td><input type="checkbox"/></td></tr> </table> <p><b>OR</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td>53-125</td><td>Calculus I</td><td style="text-align: right;">3</td><td><input type="checkbox"/></td></tr> <tr><td>53-126</td><td>Calculus II</td><td style="text-align: right;">3</td><td><input type="checkbox"/></td></tr> </table>	52-115	Chem for the Sciences 1	4	<input type="checkbox"/>	52-116	Chem for the Sciences 2	4	<input type="checkbox"/>	52-230	Fund Organic Chemistry**	4	<input type="checkbox"/>	52-341	Biochemistry	4	<input type="checkbox"/>	52-442	Biochemistry 2	4	<input type="checkbox"/>	54-111	Introductory Physics I***	4	<input type="checkbox"/>	54-112	Introductory Physics II***	4	<input type="checkbox"/>	54-211	General Physics I	4	<input type="checkbox"/>	54-212	General Physics II	4	<input type="checkbox"/>	53-123	Essentials of Calculus	3	<input type="checkbox"/>	53-141	Introduction to Statistics	3	<input type="checkbox"/>	53-125	Calculus I	3	<input type="checkbox"/>	53-141	Introduction to Statistics	3	<input type="checkbox"/>	53-125	Calculus I	3	<input type="checkbox"/>	53-126	Calculus II	3	<input type="checkbox"/>
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**Biology Elective Courses.** Select 11 cr hrs of biology electives.

50-343	Immunology	3	<input type="checkbox"/>
50-350	Plant Pathology	3	<input type="checkbox"/>
50-351	Ecology	3	<input type="checkbox"/>
50-390	Ug Research in Bio I	1-3	<input type="checkbox"/>
50-411	Radiation Biology	3	<input type="checkbox"/>
50-431	Developmental Biology	3	<input type="checkbox"/>
50-432	Microb & Mol Genetics	3	<input type="checkbox"/>
50-435	Bioinform & Genomic	3	<input type="checkbox"/>
50-442	Virology of Mammals	3	<input type="checkbox"/>
50-444	Plt & Animal Tiss Cult	1	<input type="checkbox"/>
50-455	Environmental Micro	3	<input type="checkbox"/>
50-476	Neurophysiology	3	<input type="checkbox"/>
50-490	Internship Biol/AHS	3-15	<input type="checkbox"/>
50-493	Honors Indep Study I	3	<input type="checkbox"/>
50-494	Honors Indep Study II	3	<input type="checkbox"/>

**Restrictions on Non-Classroom Courses**

1. A maximum of 3 cr hr of 50-490 may be applied as biology elective credit toward the degree.

2. A maximum of 6 cr hr from among 50-390, 50-391, 50-490, 50-493 and 50-494 may be applied as biology elective credit toward the degree.

# General Education Requirements

Two cultural diversity courses (6 cr hr) are required. Designate these with a + symbol.

## Communication (9 cr hrs)

20-101 English Composition I 3   
 50-290 Writing in Biology 3   
 \_\_\_\_\_ 3

20-201 English Composition II can be substituted for Writing in Biology (substitution requires written justification, advisor endorsement, and BAHS chairperson approval).

Suggested communication electives include: required foreign language course or 15-103 Public Speaking.

**Quantitative-Analytical Reasoning** (3 cr hrs)  
 Fulfilled by mathematics requirement for major.

**Values, Ethics, ...** (3 cr hrs)  
 50-254 Social Implications of Biology 3

## GROUP C. Natural Science and Mathematics (12 cr hrs)

Fulfilled by chemistry, physics, and mathematics requirements for the major.

### GROUP A. Humanities & Arts

(12 cr hrs; 3 departments)

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### GROUP B. Social Sciences

(12 cr hrs; 3 departments)

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## Fitness and Recreational Skills (2 cr hrs)

\_\_\_\_\_  \_\_\_\_\_

## Free Electives. List free elective courses here. Total number of cr hrs must be at least 120.

_____ <input type="checkbox"/>	_____ <input type="checkbox"/>
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