

## Assessment plan for BS in Applied Biological Sciences

### Mission

The mission of the B.S. in Applied Biological Sciences (ABS) supports the Vision and Mission of SD MINES by providing students a solid foundation in biology with a strong focus at the molecular and cellular level combined with the relevant sciences of chemistry, math, and physics. Maintenance of a high-quality curriculum with excellent classroom teaching as well as state of the art research and practical hands on experience will prepare students for career opportunities or entrance into competitive pre-professional and graduate programs. This includes careers in health care, biotechnology, environmental sciences, pharmaceutical sciences, education, law, and related disciplines.

### Program Learning Objectives (PLO)

#### Discipline-specific knowledge:

1. Graduates will understand Applied Biological Sciences based on principles of basic sciences and mathematics, preparing them for professional careers and graduate or professional school in Applied Biological Sciences.
2. Graduates will acquire laboratory and data analysis skills required for careers in ABS, graduate or professional school through laboratory courses and independent research experiences.

#### Communication

3. Graduates will communicate effectively and professionally through written and oral means on aspects of applied biological sciences.

#### Critical Thinking

4. Graduates will master problem-solving skills in applied biological sciences.

### Student Learning Outcomes (SLO)

#### Discipline-specific knowledge:

- 1a. Graduates will demonstrate understanding of mathematics and basic sciences, including chemistry and physics.
- 1b. Graduates will demonstrate understanding of principles of Applied Biological Sciences.
2. Graduates will demonstrate laboratory and data analysis skills commensurate with entry-level positions in graduate and professional schools.

#### Communication

- 3a. Graduates can give effective oral presentations on an aspect of applied biological sciences learned from course work, the literature, or laboratory research.
- 3b. Graduates can compose effective written presentations on an aspect of applied biological sciences learned from course work, the literature, or laboratory

research.

Critical Thinking

- 4a. Graduates will demonstrate mastery of problem-solving skills in applied biological sciences.
- 4b. Graduates will demonstrate the ability to integrate problem-solving skills into research-related problems.

Curriculum maps showing how learning outcomes are mapped to specific courses are on the following two pages.

# CURRICULUM (PROGRAM) MAPPING

## Name of Degree Program: Applied Biological Sciences

### REQUIRED BIOL COURSES

### FOR DEGREE IN APPLIED BIOLOGICAL SCIENCES

PROGRAM-LEVEL STUDENT LEARNING OUTCOMES	BIOL 111	BIOL 151+153	BIOL 151/3L	BIO L 331	BIOL 331L	BIOL 371	BIOL 371L	BIOL 446	BIOL 480	BIOL 490
Discipline Specific Knowledge/Skills										
1a. Graduates will demonstrate understanding of mathematics and basic sciences, including chemistry and physics.		I	I+R				R+E			
1b. Graduates will demonstrate understanding of principles of Applied Biological Sciences.	I	I	I+R	I	I+E	R+E	R+E	R+E	R+E	R+E
2. Graduates will demonstrate laboratory and data analysis skills commensurate with entry-level positions in ABS-related graduate and professional schools.			I		I		R+E			
Communication										
3a. Graduates can give an effective oral presentation of an aspect of applied biology sciences learned from course work, the literature, or laboratory research.	I		I		R		R			
3b. Graduates can compose an effective written presentation based on an aspect of applied biology sciences learned from course work, the literature, or laboratory research	I		I		R		R			E
Critical Thinking										
4a. Graduates will demonstrate mastery of problem-solving skills in applied biological sciences.	I	I		I+R	R	R	R	R	R	R
4b. Graduates will demonstrate the ability to integrate problem-solving skills into research-related problems.			I		I		R			

I = Introduction/Novice

R = Reinforced (PLO had been introduced earlier in the curriculum, and is now being reinforced)

E= Emphasis (the PLO is mastered)

**REQUIRED CHEM COURSES**
**FOR DEGREE IN APPLIED BIOLOGICAL SCIENCES**

PROGRAM-LEVEL STUDENT LEARNING OUTCOMES	CHEM 112 + 114	CHEM 112L + 114L	CHEM 326	CHEM 326L	CHEM 328	CHEM 328L	CHEM 464	CHEM 464L	CHEM 465
1a. Graduates will demonstrate understanding of mathematics and basic sciences, including chemistry and physics.	I	I	I+R	I	I+R	R+E	R+E	R+E	E
1b. Graduates will demonstrate understanding of principles of Applied Biological Sciences.							R+E	R+E	R+E
2. Graduates will demonstrate laboratory and data analysis skills commensurate with entry-level positions in ABS-related graduate and professional schools.		I		R		R		R+E	
3a. Graduates can give an effective oral presentation of an aspect of applied biology sciences learned from course work, the literature, or laboratory research.									
3b. Graduates can compose an effective written presentation based on an aspect of applied biology sciences learned from course work, the literature, or laboratory research		I		R		R		R	
4a. Graduates will demonstrate mastery of problem-solving skills in applied biological sciences.								R	R
4b. Graduates will demonstrate the ability to integrate problem-solving skills into research-related problems.								R	

I = Introduction/Novice; R = Reinforced (PLO had been introduced earlier in the curriculum, and is now being reinforced); E= Emphasis (the PLO is mastered)