B.S. Microbiology

The purpose of the BS in Microbiology is to serve students who seek to develop a strong background in microbiology and molecular biology, with applications for biotechnology, medical, and environmental biology. Majors gain experiences that prepare them to participate in the development of research plans and their implementation, and to be competent to carry out standard microbiological and molecular biology techniques in the laboratory. The BS in Microbiology prepares students to be competitive for positions in research, graduate schools, health professional schools, and in the biotechnology industry.

Core Requirements

Students pursuing a Bachelor of Science degree must satisfy the General Education Objectives (http://coursecat.isu.edu/undergraduate/academicinformation/generaleducation/) (a minimum of 36 credits). Students must also satisfy the core requirements listed below and at least **20** credits of elective courses in Microbiology. (Need 36 upper division course hours.) In order to make timely progress toward the degree, it is imperative that the student work closely with a major advisor.

Required Courses in Biological Sciences:

Code	Title	Credits
BIOL 1101 & 1101L	Biology I and Biology I Lab	4
BIOL 1102 & 1102L	Biology II and Biology II Lab	4
BIOL 2235 & 2235L	General Microbiology and General Microbiology Lab	4
BIOL 3358	Genetics	3
Chose either:		3-6
BIOL 4432	Biochemistry	
OR		
BIOL/CHEM 4445	Biochemistry I	
AND		
BIOL/CHEM 4447	Biochemistry II	
BIOL 4433 & 4433L	Microbial Physiology and Microbial Physiology Laboratory	4
BIOL 4444 & 4444L	Cell and Molecular Biology and Cell and Molecular Biology Lab	4
BIOL 4494	Seminar in Microbiology	1
Total Credits		27-30

Required Courses in Chemistry, Mathematics[1], and Physics:

Code	Title	Credits
CHEM 1111 & 1111L	General Chemistry I and General Chemistry I Lab	5
CHEM 1112 & 1112L	General Chemistry II and General Chemistry II Lab	4
CHEM 2232 & CHEM 2234	Quantitative Analysis and Quantitative Analysis Laboratory	4
CHEM 3301 & CHEM 3303	Organic Chemistry I and Organic Chemistry Laboratory I	4
CHEM 3302 & CHEM 3304	Organic Chemistry II and Organic Chemistry Laboratory II	4
MATH 1160	Survey of Calculus	3-4
or MATH 1170	Calculus I	
PHYS 1111 & PHYS 1113	General Physics I and General Physics I Laboratory	4
PHYS 1112 & PHYS 1114	General Physics II and General Physics II Laboratory	4
Total Credits		32-33

Microbiology Electives (20 credits)

Code	Title	Credits
BIOL 4434 & 4434L	Microbial Diversity and Microbial Diversity Lab	4
BIOL 4437/CHEM 4438	Experimental Biochemistry	1
BIOL 4451 & 4451L	Immunology and Immunology Laboratory	4
BIOL 4454	Advanced Immunology	3
BIOL 4455 & 4455L	Pathogenic Microbiology and Pathogenic Microbiology Laboratory	5
BIOL 4461	Advanced Genetics	3
BIOL 4466	Medical Mycology	3
BIOL 4469	Special Topics in Microbiology	1-4
BIOL 4473 & 4473L	Applied and Environmental Microbiology and Applied Environmental Microbiology Lab	4
BIOL 4475	General Virology	3
BIOL 4477	Bacterial Virology Laboratory	1
or BIOL 4478	Animal Virology Laboratory	
BIOL 4498	Seminar in Biochemistry	1

Additional Biological Sciences courses (must take at least 8 credits)

These courses are chosen to enhance student background in a particular area of interest. Suggested courses could include (but are not limited to):

Code	Title	Credits
BIOL 2209	General Ecology	4
BIOL 2280	Mentored Research Alliance	2
or BIOL 4480	Mentored Research Alliance	
BIOL 3301 & 3301L	Advanced Human Anatomy and Physiology 1 and Advanced Human Anatomy and Physiology 1 Lab	4
BIOL 3302 & 3302L	Advanced Human Anatomy and Physiology 2 and Advanced Human Anatomy and Physiology 2 Lab	4
BIOL 4417	Organic Evolution	3
BIOL 4481	Independent Problems	1-4
and/or		
BIOL 4482	Independent Problems	1-4

BIOL 1100, BIOL 1100L, BIOL 2221 and BIOL 2221L may not be used as electives for the B.S. in Microbiology.

(Courses not used to fulfill the microbiology electives could be used to satisfy this requirement.)

[1] Additional courses in Mathematics that are highly recommended for students planning to attend graduate school are MATH 1175 (prerequisite is MATH 1170), MATH 2240, MATH 2275, or MATH 3360.