

MICROBIOLOGY MAJOR WITH BIOMEDICAL OPTION

Program Curriculum

Code	Title	Credits
Degree Core Requirements		
BIOL 2004	Genetics [#]	3
BIOL 2134	Cell Function and Differentiation [#]	3
BIOL 2604	General Microbiology ^{1,#}	3
BIOL 2614	General Microbiology Laboratory ^{1,#}	1-2
BIOL 4624	Microbial Genetics [#]	3
BIOL 4634	Microbial Physiology [#]	3
BIOL 3764	Careers in Microbiology [#]	3
BCHM 3114	Biochemistry for Biotechnology and the Life Sciences [#]	3
Subtotal		22-23
Major Requirements		
BIOL 1004	Biology Orientation Seminar ³	1
BIOL 1115	Principles of Biology Laboratory ¹	1
BIOL 1116	Principles of Biology Laboratory ¹	1
CHEM 1035	General Chemistry ¹	3
CHEM 1036	General Chemistry ¹	3
CHEM 1045	General Chemistry Laboratory	1
CHEM 1046	General Chemistry Laboratory	1
CHEM 2535	Organic Chemistry [#]	3
CHEM 2536	Organic Chemistry [#]	3
CHEM 2545	Organic Chemistry Laboratory [#]	1
CHEM 2546	Organic Chemistry Laboratory [#]	1
PHYS 2205	General Physics [#]	3
PHYS 2206	General Physics [#]	3
PHYS 2215	General Physics Laboratory [#]	1
PHYS 2216	General Physics Laboratory [#]	1
Subtotal		27
Elective Courses		
Select one of the following:		3-4
BIOL 3774 & BIOL 3104	Molecular Biology and Cell and Molecular Biology Laboratory [#]	
BIOL 4644	Microbial Molecular Genetics and Physiology Laboratory [#]	
Select Group 1 or Group 2		7-8
Group 1		
BIOL 4674	Pathogenic Bacteriology [#]	
BIOL 4724	Pathogenic Bacteriology Lab [#]	
BIOL 4704 or BIOL 4734	Immunology [#] Inflammation Biology	
Group 2		
BIOL 4704	Immunology [#]	
BIOL 4714	Immunology Laboratory [#]	
BIOL 4674	Pathogenic Bacteriology [#]	
Select two of the following: (if not taken above)		8-9

BIOL 3254 & BIOL 3264	Medical and Veterinary Entomology and Medical and Veterinary Entomology Laboratory [#]	
BIOL 3454	Introductory Parasitology [#]	
BIOL 3604	Food Microbiology [#]	
BIOL 4674 & BIOL 4724	Pathogenic Bacteriology and Pathogenic Bacteriology Lab [#]	
BIOL 4704 & BIOL 4714	Immunology and Immunology Laboratory [#]	
BIOL 4994	Undergraduate Research ²	
Select one of the following: (if not taken above)		3-4
BIOL 3254	Medical and Veterinary Entomology [#]	
BIOL 3454	Introductory Parasitology [#]	
BIOL 3604	Food Microbiology [#]	
BIOL 4664	Virology [#]	
BIOL 4684	Microbiomes [#]	
BIOL 4704	Immunology [#]	
BIOL 4734	Inflammation Biology [#]	
BIOL 4874	Cancer Biology [#]	
BIOL 4994	Undergraduate Research ²	
Subtotal		21-25
Free Electives		
Select remaining credit hours to reach 120 required credit hours		0-4
Subtotal		0-4
Pathways to General Education		
<i>Pathways Concept 1 - Discourse</i>		
ENGL 1105	First-Year Writing (1F)	3
ENGL 1106	First-Year Writing (1F)	3
Select three credits in Pathway 1a (https://catalog.vt.edu/course-search/?attrs_pathways=attrs_pathways_G01A)		3
<i>Pathways Concept 2 - Critical Thinking in the Humanities</i>		
Select six credits in Pathway 2 (https://catalog.vt.edu/course-search/?attrs_pathways=attrs_pathways_G02)		6
<i>Pathways Concept 3 - Reasoning in the Social Sciences</i>		
Select six credits in Pathway 3 (https://catalog.vt.edu/course-search/?attrs_pathways=attrs_pathways_G03)		6
<i>Pathways Concept 4 - Reasoning in the Natural Sciences</i>		
BIOL 1105	Principles of Biology ¹	3
BIOL 1106	Principles of Biology ¹	3
<i>Pathways Concept 5 - Quantitative and Computational Thinking</i>		
MATH 1025	Elementary Calculus (5F)	3
MATH 1026	Elementary Calculus (5F)	3
STAT 3615	Biological Statistics (5A) [#]	3
<i>Pathways Concept 6 - Critique and Practice in Design and the Arts</i>		
Select 6 credits = 3 design + 3 arts, or 6 integrated design/arts		6
<i>Pathways Concept 7 - Critical Analysis of Identity and Equity in the United States</i>		
Select three credits in Pathway 7 (https://catalog.vt.edu/course-search/?attrs_pathways=attrs_pathways_G07)		3
Subtotal		45
Total Credits		120

Notes

¹ Students must earn a grade of "C" or better in BIOL 1105, 1106, 1115, 1116, 2604, 2614, CHEM 1035, CHEM 1036, or the equivalent. Only two attempts, including course withdrawals with grade of "W", are allowed for each course.

² To count, students must complete two semesters of BIOL 4994 for a combined total of at least 4 credits.

³ BIOL 1004 is required but will not count as major elective credit or be used to calculate in-major GPA.

Some courses listed on this checksheet may have prerequisites; please consult the University Course Catalog or check with your advisor.

Cross listed Courses on this Checksheet

- ENT/BIOL 3254: Med & Vet Entomology
- ENT/BIOL 3264: Med & Vet Entomology Lab
- FST/BIOL 3604: Food Microbiology

1. Students must earn a grade of "C" or better in BIOL 1105 Principles of Biology, BIOL 1106 Principles of Biology, BIOL 1115 Principles of Biology Laboratory, BIOL 1116 Principles of Biology Laboratory, CHEM 1035 General Chemistry, CHEM 1036 General Chemistry or equivalent upon attempting 45 credit hours (including transfer credit, advance placement or IB credit, advance standing credit, credit by examination, courses taken P/F, and courses completed with a grade of "W"). Only two attempts are allowed for each course.
2. Students must achieve an overall GPA of 2.0 and in-major GPA of 2.2 upon attempting 45 credit hours (including transfer credit, advanced placement or IB credit, advance standing credit, credit by examination, courses taken P/F, and courses completed with a grade of "W").
3. All BIOL, MATH, and STAT courses, and all courses taken to fulfill Degree Core, Major, and Elective course requirements (except BIOL 1004 Biology Orientation Seminar, BIOL 1214 Careers in Medicine, and BIOL 3814 Careers In Biological Sciences) will be used to calculate in-major GPA.

Graduation Requirements

Students must have an in-major and overall GPA of 2.0 to graduate.

All BIOL, MATH, and STAT courses, and all courses taken to fulfill Degree Core, Major, and Elective course requirements (except BIOL 1004 Biology Orientation Seminar, BIOL 1214 Careers in Medicine, and BIOL 3814 Careers In Biological Sciences) will be used to calculate in-major GPA.

Students must earn a grade of "C" or better in BIOL 1105, 1106, 1115, 1116, 2604, 2614, CHEM 1035, CHEM 1036, or the equivalent. Only two attempts, including course withdrawals with grade of "W", are allowed for each course.

BIOL 1004 is required but will not count as major elective credit or be used to calculate in-major GPA.

MICM students who are also enrolled as a BIOL (no option) student may count a maximum of 9 credits from the following courses toward the 22 required Biological Sciences elective credits: BIOL 3104, 3774, 3454,

3604, 4624, 4634, 4644, 4664, 4674, 4704, 4714, 4734, 4994, and BCHM 3114.

MICM students who are also enrolled as a Biology-Biomedical (BIOM) Option student may count a maximum of two courses from the following courses as Biomedical Option electives: BIOL 3774, 3454, 4664, 4674, 4704, 4734, and BCHM 3114.

Acceptable Substitutions

BIOL 1004 Biology Orientation Seminar: Any university-approved First-Year Experience (FYE) course

CHEM 1035 General Chemistry-CHEM 1036 General Chemistry: CHEM 1055 General Chemistry for Chemistry Majors -CHEM 1056 General Chemistry for Chemistry Majors

CHEM 1045 General Chemistry Laboratory-CHEM 1046 General Chemistry Laboratory: CHEM 1065 General Chemistry for Chemistry Majors Lab-CHEM 1066 General Chemistry for Chemistry Majors Lab

CHEM 2535 Organic Chemistry-CHEM 2536 Organic Chemistry: CHEM 2565 Principles of Organic Chemistry-CHEM 2566 Principles of Organic Chemistry

CHEM 2545 Organic Chemistry Laboratory-CHEM 2546 Organic Chemistry Laboratory: CHEM 2555 Organic Synthesis and Techniques Lab-CHEM 2556 Organic Synthesis and Techniques Lab

PHYS 2205 General Physics, PHYS 2215 General Physics Laboratory: PHYS 2305 Foundations of Physics

PHYS 2206 General Physics, PHYS 2216 General Physics Laboratory: PHYS 2306 Foundations of Physics

MATH 1025 Elementary Calculus: MATH 1225 Calculus of a Single Variable

MATH 1026 Elementary Calculus: MATH 1226 Calculus of a Single Variable

STAT 3615 Biological Statistics: STAT 3005 Statistical Methods or STAT 3604 Statistics for Social Science

Foreign Language Requirement

College of Science Foreign Language Requirement

Students who did not successfully complete at least two years of a single foreign, classical, or sign language during high school must successfully complete six semester hours of a single foreign, classical, or sign language at the college level. Courses taken to meet this requirement do not count toward the hours required for graduation. Please consult the Undergraduate Catalog for details.