BIOLOGY - M.A.

College of Sciences and Humanities
Department of Biological Sciences
www.kent.edu/biology/graduate

About This Program

Build a deeper, more versatile understanding of the life sciences while tailoring your studies across pathways such as medical biology, biological data analytics, cellular and molecular biology or a self-designed option. This flexible, coursework-focused program strengthens your scientific expertise and analytical skills, preparing you for careers in education, industry or further graduate study. Read more...

Contact Information

- **Sangeet Lamichhaney** | bscigrad@kent.edu | 330-672-2764
- Connect with an Admissions Counselor

Program Delivery

- **Delivery:**
  - In person
- **Location:**
  - Kent Campus

Examples of Possible Careers and Salaries*

Biological scientists, all other

- 1.2% slower than the average
- 63,700 number of jobs
- $93,330 potential earnings

Biological technicians

- 3.5% about as fast as the average
- 82,700 number of jobs
- $52,000 potential earnings

Food scientists and technologists

- 6.5% faster than the average
- 15,200 number of jobs
- $85,310 potential earnings

Secondary school teachers, except special and career/technical education

- -1.6% decline
- 1,094,500 number of jobs
- $64,580 potential earnings

* Source of occupation titles and labor data comes from the U.S. Bureau of Labor Statistics' Occupational Outlook Handbook. Data comprises projected percent change in employment over the next 10 years; nation-wide employment numbers; and the yearly median wage at which half of the workers in the occupation earned more than that amount and half earned less.

For more information about graduate admissions, visit the graduate admission website. For more information on international admissions, visit the international admission website.

Admission Requirements

- Bachelor's degree from an accredited college or university
- Minimum 2.750 undergraduate GPA on a 4.000-point scale
- Official transcript(s) - copies of official transcripts can be used for initial application
- Goal statement
- One letter of recommendation
- English language proficiency - all international students must provide proof of English language proficiency (unless they meet specific exceptions to waive) by earning one of the following:[1]
  - Minimum 94 TOEFL iBT score
  - Minimum 7.0 IELTS score
  - Minimum 65 PTE score
  - Minimum 120 DET score

[1] International applicants who do not meet the above test scores will not be considered for admission.

Application Deadlines

- **Fall Semester**
  - Rolling admissions
- **Spring Semester**
  - Rolling admissions
- **Summer Term**
  - Rolling admissions

Program Requirements

Major Requirements

Code	Title	Credit Hours
Major Requirements		
BSCI 60104	BIOLOGICAL STATISTICS	4
BSCI 60110	CAREER AND PROFESSIONAL SKILLS FOR LIFE SCIENTISTS	2
BSCI 60184	RESPONSIBLE CONDUCT IN RESEARCH AND TEACHING-BIOLOGICAL SCIENCES	2
BSCI 60191	SEMINAR IN BIOLOGY (repeated for 2 credit hours total)	2
BSCI 60196	INDIVIDUAL INVESTIGATION (repeated for 6 credit hours total)	6
Additional Requirements or Concentration		
Choose from the following:		15
Additional Requirements for Students Not Declaring a Concentration		
Biological Data Analytics Concentration		
Cellular and Molecular Biology Concentration		
Environmental Biology Concentration		
Medical Biology Concentration		
Minimum Total Credit Hours:		**31**

Additional Requirements for Students Not Declaring a Concentration

Code	Title	Credit Hours
Major Requirements		
Major Electives, choose from the follwoing		15
Any Biological Sciences (BSCI) Graduate Courses (50000 level or higher)		
Focus on Cell/Molecular Biology, Biomedicine or Biotechnology		
BSCI 50142	BIOENERGETICS	
BSCI 50143 & BSCI 60144	EUKARYOTIC CELL BIOLOGY and SELECTED READINGS IN EUKARYOTIC CELL BIOLOGY	
BSCI 50158	MOLECULAR BIOLOGY	
BSCI 50174	IMMUNOLOGY	
BSCI 50432	ENDOCRINOLOGY	
Focus on Ecology		
BSCI 50163	EVOLUTION	
BSCI 50363	MICROBIAL ECOLOGY	
BSCI 50364	LIMNOLOGY	
BSCI 50368	WETLAND ECOLOGY AND MANAGEMENT	
BSCI 50374	CONSERVATION BIOLOGY	
BSCI 50556	VERTEBRATE ZOOLOGY	
BSCI 60371	EVOLUTIONARY BIOLOGY	
Focus on K-12 Teaching Licensure		
BSCI 50141	EXPERIMENTAL DESIGN AND ANALYSIS IN MOLECULAR BIOLOGY	
BSCI 50163	EVOLUTION	
Minimum Total Credit Hours:		**15**

Biological Data Analytics Concentration Requirements

Code	Title	Credit Hours
Concentration Requirements		
BSCI 50218	INTRODUCTION TO GENOMICS	3-4
or BSCI 50220	BIOINFORMATICS	
or BSCI 60107	REPRODUCIBLE QUANTITATIVE METHODS FOR ECOLOGICAL DATA	
Concentration Electives, choose from the following:		12-13
CS 54202	MACHINE LEARNING AND DEEP LEARNING	
CS 63015	DATA MINING TECHNIQUES	
CS 63016	BIG DATA ANALYTICS	
CS 63018	PROBABILISTIC DATA MANAGEMENT	
LIS 60030	PEOPLE IN THE INFORMATION ECOLOGY	
Any Biological Sciences (BSCI) Graduate Courses (50000 level or higher)		
Minimum Total Credit Hours:		**15**

Cellular and Molecular Biology Concentration Requirements

Code	Title	Credit Hours
Concentration Requirements		
BSCI 50143	EUKARYOTIC CELL BIOLOGY	3
BSCI 50158	MOLECULAR BIOLOGY	3
Concentration Electives, choose from the following:		9-10
BSCI 50141	EXPERIMENTAL DESIGN AND ANALYSIS IN MOLECULAR BIOLOGY	
BSCI 50148	PRINCIPLES OF INFECTIOUS DISEASE	
BSCI 50150	MOLECULAR MECHANISMS OF DISEASE: CANCER	
BSCI 50151	MECHANISMS OF DISEASE: OBESITY AND RELATED METABOLIC DISEASES	
BSCI 50152	MOLECULAR MECHANISMS OF DISEASE: NEUROLOGICAL DISORDERS	
BSCI 50154	DIABETES AND CARDIOVASCULAR DISEASE	
BSCI 50159	MOLECULAR BIOLOGY LABORATORY	
BSCI 50174	IMMUNOLOGY	
BSCI 50220	BIOINFORMATICS	
BSCI 60200	FOUNDATIONS OF NEUROSCIENCE	
BMS 60729	CELLULAR AND MOLECULAR NEUROSCIENCE	
Any Biological Sciences (BSCI) Graduate Courses (50000 level or higher)		
Minimum Total Credit Hours:		**15**

Environmental Biology Concentration Requirements

Code	Title	Credit Hours
Concentration Requirements		
BSCI 50374	CONSERVATION BIOLOGY	4
or BSCI 50375	ENVIRONMENTAL BIOLOGY AND MANAGEMENT	
Concentration Electives, choose from the following:		11-12
BSCI 50160	MARINE BIOLOGY	
BSCI 50162	SOIL BIOLOGY	
BSCI 50163	EVOLUTION	
BSCI 50170	STREAM BIOLOGY	
BSCI 50222	INVASION BIOLOGY	
BSCI 50363	MICROBIAL ECOLOGY	
BSCI 50364	LIMNOLOGY	
BSCI 50365	FIELD METHODS IN ORNITHOLOGY	
BSCI 50368	WETLAND ECOLOGY AND MANAGEMENT	
BSCI 50374	CONSERVATION BIOLOGY	
BSCI 50375	ENVIRONMENTAL BIOLOGY AND MANAGEMENT	
BSCI 50376	TROPICAL FIELD BIOLOGY AND CONSERVATION	
BSCI 50380	BIOGEOCHEMISTRY	
BSCI 50556	VERTEBRATE ZOOLOGY	
BSCI 60370	ECOLOGICAL AND EVOLUTIONARY GENETICS	
BSCI 60371	EVOLUTIONARY BIOLOGY	
BSCI 60372	COMMUNITIES AND ECOSYSTEMS	
BSCI 60373	POPULATION AND COMMUNITY ECOLOGY	
ESCI 52030	REMOTE SENSING	
or GEOG 59230	REMOTE SENSING	
ESCI 53042	ENVIRONMENTAL GEOCHEMISTRY	
GEOG 51077	WATER AND SOCIETY	
GEOG 56080	URBAN SUSTAINABILITY	
GEOG 59070	GEOGRAPHIC INFORMATION SCIENCE	
Any Biological Sciences (BSCI) Graduate Courses (50000 level or higher)		
Other graduate courses as approved by M.A. advisor		
Minimum Total Credit Hours:		**15**

Medical Biology Concentration Requirements

Code	Title	Credit Hours
Concentration Requirements		
Medical Biology Electives, choose from the following:		6
BSCI 50148	PRINCIPLES OF INFECTIOUS DISEASE	
BSCI 50150	MOLECULAR MECHANISMS OF DISEASE: CANCER	
BSCI 50151	MECHANISMS OF DISEASE: OBESITY AND RELATED METABOLIC DISEASES	
BSCI 50152	MOLECULAR MECHANISMS OF DISEASE: NEUROLOGICAL DISORDERS	
BSCI 50154	DIABETES AND CARDIOVASCULAR DISEASE	
BSCI 50460	ADVANCED HUMAN PHYSIOLOGY	
Concentration Electives, choose from the following:		9-10
BSCI 50143	EUKARYOTIC CELL BIOLOGY	
BSCI 50146	DEVELOPMENTAL BIOLOGY	
BSCI 50147	DEVELOPMENTAL NEUROBIOLOGY	
BSCI 50148	PRINCIPLES OF INFECTIOUS DISEASE	
BSCI 50150	MOLECULAR MECHANISMS OF DISEASE: CANCER	
BSCI 50151	MECHANISMS OF DISEASE: OBESITY AND RELATED METABOLIC DISEASES	
BSCI 50152	MOLECULAR MECHANISMS OF DISEASE: NEUROLOGICAL DISORDERS	
BSCI 50154	DIABETES AND CARDIOVASCULAR DISEASE	
BSCI 50157	NEUROBIOLOGY OF DRUG ADDICTION	
BSCI 50174	IMMUNOLOGY	
BSCI 50431	NEUROENDOCRINOLOGY	
BSCI 50432	ENDOCRINOLOGY	
BSCI 50450	BIOLOGICAL CLOCKS	
BSCI 50460	ADVANCED HUMAN PHYSIOLOGY	
BSCI 50462	ADVANCED HUMAN PHYSIOLOGY: READINGS AND CASE STUDIES	
BSCI 50517	MEDICAL HISTOLOGY	
BSCI 50519	HORMONES AND BEHAVIOR	
BSCI 60200	FOUNDATIONS OF NEUROSCIENCE	
HED 64050	HEALTH BEHAVIOR	
PHIL 50005	HEALTH CARE ETHICS	
SOC 62332	SOCIAL CONTROL OF MENTAL ILLNESS	
Any Biological Sciences (BSCI) Graduate Courses (50000 level or higher)		
Minimum Total Credit Hours:		**15**

Graduation Requirements

Minimum Major GPA	Minimum Overall GPA
-	3.000

- Students must complete a minimum of 23 credit hours of biological science (BSCI) courses toward the degree with one exception: Teachers holding or pursuing K-12 licensure who do not declare a concentration may complete a minimum 18 credit hours of biological sciences (BSCI) courses toward the degree.
- The Department of Biological Sciences frequently offers special topics classes in specialized areas of interest, which can count towards the degree when approved to be part of a student's program of study. Coursework in other fields within the natural and physical sciences may be used to meet credit hour requirements when approved to be part of the student's program of study.
- No more than one-half of a graduate student's coursework may be taken in 50000-level courses.
- Grades below C are not counted toward completion of requirements for the degree.

Program Learning Outcomes

Graduates of this program will be able to:

1. Explain advanced biological concepts that extend beyond the undergraduate level.
2. Design studies to test scientific hypotheses using appropriate biological research methods.
3. Communicate scientific ideas clearly to both biology and non-biology audiences.

Full Description

The Master of Arts degree in Biology is for students wishing to gain additional knowledge in any area of the biological sciences. This is a non-thesis master's degree designed for secondary school science teachers, individuals looking for additional background or preparation for professional school (e.g. medicine, dentistry or Ph.D. programs) and those seeking employment in life science industries in a non-research capacity.

The Biology major includes the following optional concentrations:

- The **Biological Data Analytics** concentration combines required courses in data analytics and elective options in biology to provide students with the understanding of the type of data collected while conducting biological research and how to analyze it.
- The **Cellular and Molecular Biology** concentration provides a heavy focus on cell-to-cell interactions and signaling pathways to give students a deep understanding of the cellular and molecular processes that occur within cells and physiological systems.
- The **Environmental Biology** concentration provides students with a balance between better understanding the relationships between organisms and the environment and how this balance can be sustained through environmental management and conservation.
- The **Medical Biology** concentration provides students with a deep understanding of physiological systems and the mechanisms that underlie various disorders and disease pathologies.

Students who declare the Biology major with no concentration will select their area of specialization in consultation with an academic faculty advisor.