MASTER OF SCIENCE IN BIOLOGY
COLLEGE OF ARTS AND SCIENCES

Purpose Statement:

To enhance student preparation for professional school, graduate school, or career opportunities.

Program Description

The Master of Science in Biology is offered through two tracks: Pre-Professional and General Biology. The Pre-Professional track is designed for students who are seeking to be better prepared for their particular health-related professional program. The General Biology track is a broader, more customized program for students who are seeking to further their education or career opportunities through advanced training in Biology. The program includes mentoring and advising for students for both professional programs and career preparation. The Master of Science in Biology is very affordable compared to similar programs around the country, and students who complete advanced training in Biology at Union are extremely well prepared to be successful at the professional level (for more information, please visit the program website at www.uu.edu/msbio).

Admission Information

Admission Requirements

- Bachelor's degree from accredited college or university; Of cial transcript(s) showing all course work, completion of baccalaureate degree(s), and all graduate credit previously attempted. Even if withdrawal occurred prior to earning credits and even if those credits do not apply to the current degree being sought, of cial transcripts must be sent from each institution.
- Minimum undergraduate GPA of 2.5.
- Minimum of 12 undergraduate hours in biology applicable to a biology major.
- Statement of purpose (500-1000 words) which identi es your educational goals and expectations from the program as well as your primary and secondary career objectives.
- Three letters of recommendation.
- Scores from professional exam required (i.e, GRE, MCAT, PCAT, etc.).

Retention Criteria

- Must maintain minimum 3.0 GPA
- If not achieved after Fall term, student will be on probation, and will be able to raise the GPA with the Winter term course
- If GPA of 3.0 is not achieved after Winter term, student may be dismissed from the program.

Alternate List

Students who otherwise meet the eligibility requirements for the Master of Science in Biology but who apply after the entering class has been lled will be placed on an alternate list and will be noti ed if they are selected for inclusion in the program for the upcoming academic year. Students who are placed on the alternate list and who are not admitted will receive a refund of half of their Application Fee ($25).

Completion Requirements

Both the Pre-Professional and General Biology tracks require 30 credit hours and a nal GPA of 3.0 to graduate. Students complete the 30 hours over a sequence of three terms, taking 14 hours in the Fall, 4 hours in the Winter, and a 2 hour required course in both the Fall and Spring, leading to the completion of a non-thesis nal paper. At least one course each Fall, Winter and Spring term must include the accompanying lab section. Students may take additional laboratory sections if space permits.

A. BIO 518, 570, 571
B. Fall Semester: Three courses from BIO 505 or 521, 510, 512, 514, 517, 525, or 540 (one of the selected courses must have a lab component). Additional options for General Track: BIO 501, 536, 543, 555, 559, 560.
C. Winter Term: One course from BIO 541 or 542; Additional options for General Track: BIO 556, 557.
D. Spring Semester: Three courses from BIO 507 or 522, 515, 516, or 523 (one of the selected courses must have a lab component). Additional options for General Track: BIO 511, 535, 537, 538, 558.
E. Special Topics in Cell or Molecular Biology may be considered if applicable (BIO 597).

Each student is assigned a mentor who will work closely with the student to select appropriate courses. The mentor will also work with the student throughout the Graduate Project courses to complete the non-thesis nal paper.

Financial Information

- Application Fee: $50
- Laboratory Fees: A lab fee will be assessed for each lab course.
- Tuition/semester hour: $500
- Deposit: $500 (will be applied to your rst semester's tuition following matriculation); due May 1 or within two weeks of acceptance of your application. The deposit is 100% refundable within 20 business days of the acceptance of your application, 50% refundable between 21 and 35 days after acceptance of your application, non-refundable after 35 days of acceptance of your application). No refunds of deposits will be given after July 1.

- General Student Fee: $20/hour
- All nancial information is subject to change without notice.

Financial Assistance

Financial aid information for graduate students is available on our website at http://www.uu.edu/ nancialaid/graduate/. Generally, graduate students may be eligible for Federal Direct student loans or private alternative student loans (*www.uu.edu/financialaid/loans/alternative-lender-list.cfm*), depending on the program of study and the eligibility of the borrower. Union University is also approved by the Department for Veterans Affairs to offer educational bene ts to veterans, reservists, and dependents of veterans who qualify for Veterans Bene ts. Any person who quali es for VA Bene ts should check with the Of ce of Student Financial Planning as soon as possible after acceptance into a graduate program. Additional external scholarship information may be obtained through www.fastweb.com

Course Descriptions: Biology (BIO)

501/501L. Invertebrate Zoology (3) and Invertebrate Zoology Lab (1) F–Even Years
Classi cation, morphology, physiology, and ecology of the invertebrate animals. Three hours lecture and optional 3 hours laboratory/week.

505. Applied Anatomy & Physiology I (3) F
Prerequisites: BIO 221 and 222 or permission of instructor.
An intensive examination of the human body that addresses the normal complex physiological processes of the cell, uids and electrolytes, acid-base balance, temperature regulation, vascular hemodynamics, mobilization of uids through the body and lymphatic system, musculoskeletal systems and function of the myocardium. The acquired information will provide the student with a body of knowledge to critically evaluate co-existing conditions of the surgical patient.

507. Applied Anatomy & Physiology II (3) S
Prerequisites: BIO 221 and 222 or permission of instructor.
A continuation of 505 focusing on the normal complex physiological processes of blood components and coagulation and the respiratory, renal, endocrine, digestive and nervous system.

510. Advanced Human Gross Anatomy (3) F
Prerequisites: BIO 221 & 222 or BIO 505 & 507 or permission of instructor.
This course will incorporate the dissection of cadavers and viewing of anatomical models in understanding the nervous, endocrine, cardiovascular, respiratory, digestive, and urinary systems of the human body. Additional emphasis is placed on the needs of professional health care personnel.

511. Conservation Techniques (3) S–Even Years
A eld intensive introduction to techniques for determin ing the age of many species, trapping for population assess ments, terrestrial and aquatic sampling methods, methods for assessing population health through necropsies, and habitat management techniques. One hour lecture and 6 hours laboratory/week.

512/512L. Comparative Vertebrate Anatomy (3) and Comparative Vertebrate Anatomy Lab (1) F–Odd Years
Study of the similarities of anatomy and early development of vertebrates, complemented by dissection of representative adults. Three hours lecture and optional 3 hours laboratory/week.

514. Immune Response to Infectious Disease (3) F
This course reviews the organisms associated with infections in humans with application directed towards those most commonly encountered in the United States. This will be integrated with a study of the immune system, how the body responds to various types of infections, and relevant clinical treatment methods.

515/515L. Genetics (3) and Genetics Lab (1) S
A study of the principles of heredity including both classical and molecular genetics. Three hours lecture and optional 3 hours laboratory/week.

516/516L. Physiology (3) and Physiology Lab (1) S
A study of the principles of physiology, emphasizing metabolic processes common to many organisms. Three hours lecture and optional 3 hours laboratory/week.

517/517L. Developmental Biology (3) and Developmental Biology Lab (1) F
A study of development in organisms, including both classical, descriptive embryology and contemporary investigations of processes involved in morphogenesis and differentiation. Three hours lecture and optional 3 hours laboratory/week.

518. Career Development in Biology (2) F
This course is designed to develop critical professional skills in students interested in a career in the biological sciences. An emphasis will be in guiding the students

522/522L. Advanced Human Anatomy and Physiology II (3) and Advanced Human Anatomy & Physiology II Lab (1) S
Prerequisite: BIO 521.

practices. The laboratory will include eld trips that will focus on tree identi cation. Three hours lecture and op tional 3 hours laboratory/week.

560/560L. Plant-Insect Interactions (3) and Plant-Insect Interactions Lab (1) F–Odd Years
This course is designed to introduce the student to insects and their relationships with plants. Lecture will cover in sect ecology, taxonomy, and biology, as well as plant strate gies to overcome insect damage and mutualism between plants and insects. The laboratory and eld portions of the class will involve insect collection and identi cation, along with the evaluation of positive and negative impacts of insects on plants. Three hours lecture and optional 3 hours laboratory/week.

570. Graduate Project I (2) F
Students enrolling in this course will work with a faculty mentor on a year-long project, culminating in a research