

BIOLOGICAL SCIENCES

Web: <http://www.emporia.edu/biosci>

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William Jensen, Graduate Program Coordinator

Graduate Faculty

Professors: Melissa Bailey, Scott S. Crupper, William Jensen, Lynnette C. Sievert, Marshall Sundberg.

Associate Professors: Tim Burnett, Brenda Koerner.

Assistant Professors: Stephen Fields, Zachary Klein, David McKenzie, Alexis Powell, Darren Rebar.

The graduate program of the Department of Biological Sciences is designed to qualify persons for teaching biology in community college, and liberal arts colleges; for continued graduate work at the doctoral level; and for employment in various fields of biology, including certain fields of applied biology.

Lecture rooms, teaching laboratories, a greenhouse, and research facilities of the department are located in Breukelman Hall. Constant-temperature chambers for plant and animal studies, centrifuges of various kinds, and electrophoretic, spectrographic, chromatographic, electrophysiological, and immunochemical instruments, as well as field-operated physioecological monitoring equipment are extensively used by graduate students. There is also equipment for modern molecular biology (e.g. DNA sequencer), animal facilities, a herbarium, and research microscopes. A natural history museum, with specimens mounted by internationally recognized taxidermist Richard H. Schmidt, contains hundreds of species of birds, mammals, fish mounts, and hand-painted molds of Kansas snakes. The museum also has more than a thousand other vertebrate study specimens. A field station, The Ross Natural History Reservation, consisting of laboratory buildings, ponds, and 200 acres of native grassland and located ten miles northwest of the main campus is extensively used in conjunction with class work, research, and science education. In addition, the students in our graduate programs have access to two Ozarkian wooded areas, two wetlands, a 40 acre tall grass prairie area in the Flint Hills with a spring, stream and pond, and several Federal and State reservoirs within a short drive. The Kansas Department of Wildlife and

Parks has a research office on campus, and often interacts with the department.

Admission Requirements

Students who plan to do graduate work in biology should have an adequate background of undergraduate courses suitable to the area of biology in which they are interested. If such a background is lacking or incomplete, the student may be asked to make up these deficiencies in addition to pursuing the normal graduate program.

In addition to the Application For Admission To Graduate Study, the Department of Biological Sciences uses a special application that is online, or is available upon request from the Graduate Coordinator of the department. We require the applicant to submit references and a personal background statement detailing goals and experiences in biology. International students must apply for graduate school through the International Student Office. The department's admission committee will make a decision based upon the applicant's undergraduate grade point average, the application materials, and a willing advisor. The applicant can be accepted unconditionally, on a probationary basis, or the applicant can be denied. To be considered for spring admission, completed Master of Science applications need to be received by November 15 and by April 15 for summer/fall admission. There are no application deadlines for Master of Arts applications and their review will be performed as they are received.

Degree Candidacy Requirements

If the academic record, English proficiency examination, proposed plan of research and degree plan are satisfactory, the Degree Candidacy Card will be signed by the Graduate Coordinator of the department and forwarded to the Graduate School. If the record is unsatisfactory, the student will not be admitted to degree candidacy and can be asked to terminate graduate study.

In the event the degree candidacy application is denied, the student can appeal the case by letter to the Department of Biological Sciences Graduate Committee for review. The committee, after consulting with the advisor, can require that the student discontinue graduate study or suggest that the student complete additional course work.

Master's Degree, Biology

Students must pass an English proficiency examination given by the department during the first semester of enrollment and prior to enrolling GB 752. The student must present a public seminar and take an oral examination over the research at the completion of the thesis or research problem.

Master of Science (M.S.) For those students considering graduate work beyond the master's degree, or employment as professional biologists, the M.S. program of study is strongly recommended. This program is designed to provide students with a more sophisticated research experience. The major in biology with a thesis requires not less than 30 hours of graduate credit. Up to nine hours of approved graduate course work outside the department may be accepted towards the graduate course work requirements.

Required Courses	Hours
GB 750 Research Design and Analysis	3 hours
GB 752 Scientific Writing	2 hours
GB 770 Graduate Research Seminar (2 hrs. credit, 2 hrs. non-credit)	2 hours
GB 890 Thesis, MS	5 hours
Electives above 500 level (may include no more than 7 hrs of Research)	18 hours
Total Hours	30 hours

Master of Science (M.S.) (Non-thesis)

The M.S. (Non-thesis) in Biological Sciences will emphasize broad graduate training, designed to educate and train students with specific professional goals. As such, a restrictive curriculum will not be specified. Instead, individualized programs will be designed according to the needs and career objectives of the individual student, in consultation with the student and Department faculty members with expertise in the chosen area of study. The program of study must be approved by both the student's major advisor and by the Graduate Coordinator. The M.S. (Non-thesis) program will require 35 hours of course work (in addition to 2 hours of Biology Seminar GB 771) and an oral examination. The M.S. (Non-thesis) program requires GB 750 Research Design and Analysis and GB 752 Scientific Writing. A maximum of 6 hours of research or internship and research combined may be counted toward the 35 hours. Up to

nine hours of approved graduate course work outside the department may be accepted towards the graduate course work requirements. At least 60% of graduate credit hours need be 700-level or above.

All students enrolled in the M.S. (Non-thesis) program must select an exam committee of at least three faculty members that will administer the oral examination. If the student fails the exam on the first attempt, a second attempt must be made the following semester (including summer semesters). Failing the comprehensive oral exam a second time will require a formal petition for a third attempt. Denial of the petition will result in dismissal from the program.

Required Courses

GB 750 Research Design and Analysis	3 hours
GB 752 Scientific Writing	2 hours
GB 770 Graduate Research Seminar	2 hours
GB 771 Biology Seminar (2 hrs non-credit)	0 hours
Electives above 500 level (may include no more than 6 hrs of Research and Internship)	28 hours
Total Hours	35 hours

Master of Arts Degree, Biology

The M.A. in Biological Sciences emphasizes broad graduate training, designed to educate and train students with specific professional goals. As such, a restrictive curriculum will not be specified. Instead, individualized programs will be designed according to the needs and career objectives of the individual student, in consultation with the student and Department faculty members with expertise in the chosen area of study. The program of study must be approved by both the student's major advisor and by the Graduate Coordinator. The M.A. program requires 35 hours of course work and an oral examination. A maximum of 6 hours of research may be counted toward the 35 hours. Up to nine hours of approved graduate course work outside the department may be accepted towards the graduate course work requirements.

All students enrolled in the M.A. program must select an exam committee of at least three faculty members who will administer the oral examination. If the student fails the exam on the first attempt, a second attempt must be made the following semester (including summer semesters). Failing the

comprehensive oral exam a second time will require a formal petition for a third attempt. Denial of the petition will result in dismissal from the program.

Master of Science in Forensic Science – Criminalistics Concentration

Admission Requirements

Students who plan to do graduate work in the MSFS concentration should have an adequate background of undergraduate courses suitable to the area of forensic science in which they are interested. If such a background is lacking or incomplete, the student may be asked to make up these deficiencies in addition to pursuing the normal graduate program. Students are required to have taken a minimum of one semester of general biology or equivalent and one semester of general chemistry or equivalent. Each student's academic background will be considered by the admissions committee on an individual basis. A minimum undergraduate GPA of a 3.0 is required for admission. Students with lower GPAs may be considered on a case-by-case basis, but may be admitted to the program on probation.

Required Courses

FO 702 Biological and Physical Evidence	3 hours
FO 710 Forensic Microscopy	3 hours
FO 711 Forensic Microscopy Laboratory	2 hours
FO 770 Graduate Research Seminar	1-2 hours
FO 771 Forensic Science Seminar	1-2 hours
FO 850 Molecular Techniques for Forensic Scientists	3 hours
Electives at or above the 500 level	19 hours

2 of the following (total 6 hours):

FO 803 Current Research in Forensic Science	3 hours
FO 809 Graduate Project in Forensic Science	3 hours
FO 886 Internship: Forensic Science	3 hours
FO 890 Thesis, MSFS	1-6 hours

Total Hours for M.S. in Forensic Science 40 hours

Master of Science in Forensic Science – Biology or Chemistry Concentration

Admission Requirements

Students wishing to pursue the MSFS – Biology concentration must have an undergraduate degree in a natural or forensic science with relevant background courses suitable to the area of study in which they are interested. If such a background is lacking or incomplete, the student may be asked to make up these deficiencies in addition to pursuing the normal graduate program.

Students must have taken Quantitative Analysis or equivalent before they are allowed to take CH 777 or CH 779. A minimum undergraduate GPA of a 3.0 is required for admission. Students with lower GPAs may be considered on a case-by-case basis, but may be admitted to the program on probation.

Master of Science in Forensic Science – Biology Concentration

Required Courses

FO 702 Biological and Physical Evidence	3 hours
FO 770 Graduate Research Seminar	1-2 hours
FO 771 Forensic Science Seminar	1-2 hours
FO 850 Molecular Techniques for Forensic Scientists	3 hours
Electives at or above the 500 level	27 hours

At least 1 of the following:

FO 803 Current Research in Forensic Science	3 hours
FO 809 Graduate Project in Forensic Science	1-6 hours
FO 886 Internship: Forensic Science	3 hours
FO 890 Thesis, MSFS	1-6 hours

Total Hours for M.S. in Forensic Science 40 hours

Master of Science in Forensic Science – Chemistry Concentration

Required Courses

FO 702 Biological and Physical Evidence	3 hours
FO 770 Graduate Research Seminar	1-2 hours
FO 771 Forensic Science Seminar	1-2 hours
CH 777 Instrumental Analysis	5 hours
CH 779 Advanced Instrumental Methods of Analysis	5 hours
FO 720 Toxicology	3 hours

GB 859 Pharmacology	2 hours
FO 859 Introduction to Drug Design	2 hours
Electives at or above the 500 level	13 hours

At least 1 of the following:

FO 803 Current Research in Forensic Science	3 hours
FO 809 Graduate Project in Forensic Science	1-6 hours
FO 886 Internship: Forensic Science	3 hours
FO 890 Thesis, MSFS	1-6 hours

Total	40 hours
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