SCHOOL OF BIOLOGICAL SCIENCES
GRADUATE PROGRAM GUIDELINES
2024 - 2025 ACADEMIC YEAR

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Introduction

This document describes the procedural requirements and details associated with the granting of masters and doctoral degrees by the School of Biological Sciences (SBS). For graduate program governance purposes, the SBS has defined three specializations with which faculty and graduate students are affiliated. Each specialization (Genetics, Cellular, & Molecular Biology, Ecology, Evolution & Behavior, or Bioinformatics) indicated after the major on official records and transcripts. Requirements set forth and supervised by the SBS Graduate Program Committee described herein include general requirements of the School as well as specific requirements of each specialization. General requirements for graduate degrees at UNL are available at the following website: graduate.unl.edu/academics/program-steps.

General Information and Requirements for Graduate Studies in the School of Biological Sciences (SBS)

Specializations

SBS offers graduate degrees with focus in Ecology, Evolution and Behavior (EEB) and Genetics, Cell, and Molecular Biology (GCMB). EEB and GCMB are SBS specializations. The SBS faculty are organized into two sections, EEB and GCMB, that largely correspond to the faculty member's specialization affiliation. Some faculty are affiliated with both specializations. An Interdisciplinary Bioinformatics specialization (http://bioinfolab.unl.edu/unlbioinfo/specialization) is also available for PhD students; students who elect this specialization must also select an SBS specialization. Faculty affiliated with the EEB and GCMB are listed on page 17.

Once admitted to the program, students are required to follow requirements of UNL's Graduate Studies, the SBS Graduate Program, and their chosen specialization. Although graduate students are typically affiliated with the same specialization as their advisor, students may choose any specialization, with approval from the Graduate Committee. With approval of the Graduate Committee, students may transfer between specializations.

Forms that must be completed are available on the SBS website (biosci.unl.edu) and the Graduate Studies website (graduate.unl.edu/academics/program-steps).

Graduate Committee

The SBS Graduate Committee is charged with coordinating recruitment of new graduate students, providing a timely review of graduate student applications, and making recommendations to the Director for admission and support of new students. The Graduate Committee also conducts an annual review of graduate student academic performance and progress, recommends changes in graduate student status, certifies examining and supervisory committees, and recommends curricular changes to the curriculum committee.

The Graduate Committee will consist of three faculty and one graduate student representative. The faculty members shall include one representative from each SBS Section (EEB and GCMB), the Graduate Program Director, and the Director of the School as an ex officio member. The graduate student representative shall be designated by the Biology Graduate Student Association (BioGSA). The Graduate Program Director will serve as Chair of the Graduate Committee.

Applications to SBS

Application instructions and general information are posted on-line (biosci.unl.edu) and the official application form for admission to a Graduate Program at UNL can be found at the UNL Graduate Studies website (graduate.unl.edu). The Graduate Coordinator is responsible for processing application materials and providing guidance to students expressing an interest in the SBS Graduate Program. Typically, students apply by December 1st for admission the following fall. EEB and GCMB students are admitted for spring matriculation only under exceptional circumstances and must be accepted by a majority vote of faculty in the respective sections.

Degree Options

The School of Biological Sciences awards the Doctor of Philosophy (PhD) and Option A Master of Science (MS) degrees as currently defined by the Graduate College. Graduate training in the School is research-oriented; thus SBS does not admit students to pursue an Option B MS degree. Under exceptional circumstances a student in the program may petition to complete an Option B MS degree, with approval from the Graduate Committee. Students may pursue a PhD directly or may enter the PhD program following completion of an MA or MS degree.

Requirements for Admission

Applications must include transcripts from all previously attended colleges and universities, a statement of research experience and research interests (outlining the student's academic interests and long-term goals), a CV or resume, and a TOEFL examination score for students whose native language is not English. **Scores from the GRE Advanced Subject Test are not required** but can be submitted if the applicant wishes. Minimum standards are a B.A. or B.S. degree (or equivalent) from an accredited institution, cumulative grade point average equivalent to a 3.0 (B). For international applicants, a TOEFL score of 565 for paper-based test, 225 for computer-based test, or 85 for the internet-based test is required. In lieu of an applicant meeting one of the above criteria, consideration for admission may be based on a personal interview and/or correspondence. In addition, applicants must identify three individuals from whom letters of recommendation will be requested.

EEB and GCMB

Graduate recruiting is organized by each specialization. The section representatives to the Graduate Committee coordinate the initial evaluation of applicants, invitations to interview, and final ranking of applicants. Prospective student interviews are arranged in February or March. Formal meetings with faculty and current graduate students are usually held on a Thursday/Friday, and social events follow in the evening. Ranked lists from each specialization are evaluated by the Graduate Committee, which makes recommendations to the Director regarding admission and financial support. Admitted students receive a formal offer letter, and the deadline for student acceptance of financial support is April 15th.

Change in Degree and Minor Information

Change of Degree

Students wishing to change their degree program must complete a Change of Degree form.

Students wishing to change from the PhD to the MS program are required to obtain approval of their PhD Supervisory Committee and the Graduate Committee. Note that Graduate Studies guidelines are that a student cannot defend his/her MS thesis in the same semester in which they switched from the PhD to the MS program.

Students wishing to change from the MS to PhD program are required to obtain the approval of their MS advisor, proposed PhD advisor (if different from the MS advisor), current MS Advisory Committee, and the Graduate Committee. **Masters students may request a change to the PhD program no earlier than their second semester.** A student may defend his/her/their MS thesis and obtain a MS degree en route to the PhD, or move directly into the PhD program without completing an MS.

Minor in Biological Sciences

Students majoring in fields of study outside SBS may obtain a minor in Biological Sciences with approval of the SBS Graduate Committee. A letter of intent should be sent to the SBS Graduate Chair prior to the beginning of the course of studies, and the SBS Graduate Committee needs to approve the proposed Memorandum of Courses or Program of Studies. A minor in SBS for the MS degree requires at least 9 hours of graduate course work in Biological Sciences; a minor in SBS for the PhD degree requires at least 16 hours of graduate course work in Biological Sciences, with 6 of those hours in 900-level courses or 800-level courses without a 400-level counterpart. BIOS credit hours used to complete the minor in Biological Sciences must be in courses whose home department is Biological Sciences (i.e., not cross-listed courses whose home department is not Biological Sciences).

Learning Outcomes and Assessment

Only required outcomes will be assessed. The desirable outcomes are likely to emerge *en route* to finishing a Master's or PhD degree. Students are encouraged to decide on a set of desirable outcomes to achieve their career goals, include them in the Individual Development Plan (IDP) and discuss progress towards these outcomes with their advisor and/or committee.

Masters Learning Outcomes

Required Outcomes

- Develop scientific and technological literacy and research skills in the student's focal discipline.
  - Demonstrate disciplinary breadth.
  - Demonstrate disciplinary depth.
  - Demonstrate the ability to survey and synthesize scientific literature.
  - Demonstrate the ability to conduct and analyze the results of research projects.
  - Demonstrate the ability to effectively communicate research findings orally and in writing to other scientists and the public.
- Demonstrate proper ethical standards in all aspects of professional life through responsible conduct of research and promotion of diverse, equitable, and inclusive learning and working environments.

Desirable Outcomes

- Develop communication, professional competencies, and career-related skills.
  - Develop the ability to conduct interdisciplinary research in collaborative teams.
  - Develop an understanding of the range of career options in biology available after graduation.
- Develop effective teaching strategies, including
  - an understanding of effective strategies to achieve learning outcomes.

Assessment of Required Outcomes for a Masters degree

Learning Outcome	**Assessment Method/Measure**	**Achievement Target /Criterion for success**
Develop scientific and technological literacy, and research skills in the student's focal discipline.		
Demonstrate disciplinary breadth	Successful completion of courses listed in Program of Studies.	Average GPA ≥ 3.0.
Demonstrate disciplinary depth	Introduction section to MS thesis	Passing thesis defense
Demonstrate the ability to survey and synthesize scientific literature.	MS thesis defense	Passing thesis defense

Demonstrate the ability to design, conduct and analyze the results of independent research projects.	Evaluation by committee members during committee meetings and of the annual reports; Thesis defense.	Demonstrate satisfactory progress in annual reports; pass thesis defense.
Demonstrate the ability to effectively communicate research findings orally and in writing to other scientists and the public.	EEB/GCMB seminar, oral or poster presentations at the annual Biology Graduate Students Association Symposium or professional meetings. Thesis or peer-reviewed journal article.	≥ 3 oral or poster presentations. Publication(s) or thesis
Demonstrate proper ethical standards in all aspects of professional life		
Demonstrate responsible conduct of research and promotion of diverse, equitable, and inclusive learning and working environments.	IACUC/IRB/IBC/RCR training Write a DEI statement as part of the Professionalism course	Completion of relevant training Passing Professionalism course (This reflects that a student has established a baseline understanding of research conduct)

PhD Learning Outcomes

Required Outcomes

- Develop scientific and technological literacy, and research skills in the student's focal discipline.
  - Demonstrate disciplinary breadth.
  - Demonstrate disciplinary depth.
  - Demonstrate the ability to survey and synthesize scientific literature and identify knowledge gaps.
  - Demonstrate the ability to design, conduct and analyze the results of independent research projects addressing identified knowledge gaps.
  - Demonstrate the ability to effectively communicate research findings orally and in writing to other scientists and the public.
  - Develop the ability to write proposals.
- Demonstrate proper ethical standards in all aspects of professional life through responsible conduct of research and promotion of diverse, equitable, and inclusive learning and working environments.

Desirable Outcomes

- Develop leadership, communication, professional competencies, and career-related skills including
  - the ability to conduct interdisciplinary research in collaborative teams,
  - skills important for training and mentoring young professionals in research, and
  - an understanding of the range of career options in biology available after graduation.
- Develop effective teaching strategies, including
  - an understanding of effective strategies to achieve learning outcomes, and
  - the ability to implement pedagogical methods for inclusive and effective training and assessment.

Assessment of Required Outcomes for a PhD degree

Learning Outcome	Assessment Method/Measure	Achievement Target/Criterion for success
Develop scientific and technological literacy, and research skills in the student's focal discipline.		
Demonstrate disciplinary breadth	Successful completion of courses listed in Program of Studies.	Average GPA ≥ 3.0.
Demonstrate disciplinary depth	Comprehensive exam.	Pass exam
Demonstrate the ability to survey and synthesize scientific literature and identify knowledge gaps.	Comprehensive exam.	Pass exam.
Demonstrate the ability to design, conduct and analyze the results of	Evaluation by committee members during committee	Demonstrate satisfactory progress

independent research projects addressing identified knowledge gaps.	meetings and of the annual reports; Thesis defense.	in annual reports; pass thesis defense.
Demonstrate the ability to effectively communicate research findings orally and in writing to other scientists and the public.	EEB/GCMB seminar, oral or poster presentations at the annual Biology Graduate Students Association Symposium or professional meetings. Thesis or peer-reviewed journal article.	≥ 5 oral or poster presentations. Publication(s) or thesis
Develop the ability to write proposals	Applying for local (e.g., SBS special funds) or external funding, or participating in grant writing workshop	≥ 3 proposal submissions or completion of grant writing workshop
Demonstrate proper ethical standards in all aspects of professional life		
Demonstrate responsible conduct of research and promotion of diverse, equitable, and inclusive learning and working environments.	IACUC/IRB/IBC/RCR training Write a DEI statement as part of the Professionalism course	Completion of relevant training Passing Professionalism course (This reflects that a student has established a baseline understanding of research conduct.)

School of Biological Sciences Degree Requirements

The UNL Office of Graduate Studies website (graduate.unl.edu/academics/program-steps) lists the requirements for graduate studies at UNL that apply to all academic programs, including the School of Biological Sciences. A student is expected to satisfy the requirements in force at the time of admission to a degree program. **The School of Biological Sciences** sets forth specific requirements to confer MS and PhD degrees in addition to those listed on the Graduate Studies website. Details of these requirements and expected procedures are formalized by each specialization. Some SBS requirements not listed on the *Graduate Studies* website include:

PhD and MS students in EEB and GCMB

New Student Orientation: Before classes begin in the fall semester the Graduate Program Director and the Graduate Coordinator will conduct an orientation for all incoming students. At this meeting each student will receive a copy of the Graduate Handbook, and the guidelines and general expectations of our program will be discussed.

Guidance Interview: Prior to or early during the first semester in residency each student will meet with his/her/their potential advisor and/or specialization faculty to determine the coursework to be taken during the first semester and receive detailed information concerning School and specialization requirements and procedures. Following the Guidance Interview students must submit a completed Guidance Interview form to the Graduate Coordinator.

Professionalism course: All incoming students are required to take this course in their first fall semester. This course is typically taught by the Graduate Program Director. Topics covered include scientific writing, the publication process, oral and poster presentations, CVs, research ethics, grant writing, communicating science to a broad audience, formal and informal networking, and general advice on how to succeed as a graduate student.

Seminars: Each specialization will run a seminar course every semester, and all SBS students are required to participate in one of these seminars in each semester in which they are in residence. Specialization seminars will include a mix of outside speakers, SBS faculty and student speakers, and brown-bag discussions. In the case of schedule conflicts, a student may register for an alternative seminar with the approval of his/her/their Supervisory Committee.

Presentation to the SBS Community: Starting in their second year all students are required to present their work (either proposed, in progress, or completed) to the greater SBS community each year. Student presentations may be oral, as part of one of the specialization seminars (915A or 915E), or as a poster at the annual Biology Graduate Students Association symposium.

Individual Development Plan (IDP): All students are required to produce an IDP, which documents long- and short-term professional goals, strengths and talents, development opportunities and an

action plan. Students are expected to update the IDP regularly and have an IDP meeting with their faculty advisor at least once a year.

Addressing concerns with the student-advisor relationship

An effective graduate student–advisor relationship should be built on support and trust. Both faculty advisor and graduate student are responsible for strengthening and maintaining this relationship throughout the student's tenure. Remember that in addition to advising graduate students, faculty have numerous teaching, research, and service responsibilities. Advisors differ in their responsibilities and graduate students vary in their advising needs, which makes each student-advisor relationship unique. If you are dissatisfied with this relationship, your first step should be to discuss the issue with your advisor. In preparation for that meeting, take time to consider your specific issue and how best to present your concerns to your advisor. Don't downplay your concerns. If this meeting does not produce the desired outcome, the following steps are available to you:

- talk to a faculty member on your committee or a trusted faculty member
- talk to the SBS Graduate Program Director
- talk to the SBS Director

Annual Progress Report, Academic Performance, Probation, and Termination:

1. By the first day of the fall Semester, students beyond their first semester must submit their Annual Report electronically to their faculty advisor, Supervisory Committee and to the Graduate Coordinator. **You should submit your report to your faculty advisor before submitting to the rest of the Supervisory Committee.** Supervisory Committee members are to evaluate student Annual Reports and submit their evaluation to the Graduate Coordinator via email. If evaluations of Needs Improvement or Unsatisfactory are given, faculty **must** justify this recommendation in writing.

2. No later than two weeks after the first day of the fall Semester each committee member must email the Graduate Coordinator with their evaluation and a brief justification of that evaluation (Satisfactory, Needs Improvement, Unsatisfactory). Failure to complete Graduate Studies, SBS, or specialization requirements is grounds for a less than Satisfactory evaluation. In addition, poor research progress is grounds for a less than Satisfactory evaluation.

3. If any evaluations are **Needs Improvement** the student will be required to schedule a meeting with his/her/their committee. At this meeting deficiencies will be discussed and suggestions to overcome those deficiencies will be proposed. **No later than November 15th**, the student's advisor should submit a letter to the SBS Graduate Committee summarizing the salient points of the meeting. No remediation plan is necessary, and no other action is needed.

4. The Graduate Coordinator will inform the student (and their committee) of his/her/their evaluations.

5. If any evaluations are **Unsatisfactory** the student will be required to schedule a committee meeting. At this meeting a plan for remediation must be developed. **No later than November 15th** the student's adviser should submit a letter to the SBS Graduate Committee (cc'd to the student and Supervisory Committee) summarizing the deficiencies and describing a plan for remediation.

Within 6 months (no later than **April 15** of the same academic year) the student must have another committee meeting to determine if the plan for remediation has been satisfactorily completed. If the student has completed the plan and is making satisfactory progress the advisor must report this change in status in writing to the SBS Graduate Committee.

Students that fail to achieve satisfactory status by **April 15** will be put on probation. Once on probation the student will have another 4 months to achieve satisfactory status**. Failure to achieve Satisfactory status constitutes grounds for dismissal from the graduate program**. A student who has not achieved Satisfactory status will not be allowed to register for the fall semester.

6. Receiving Unsatisfactory evaluations for similar reasons from the majority of the Committee in two consecutive years constitutes grounds for dismissal from the graduate program.

Summary of Procedures for the MS Degree

*All forms and reports should be submitted to Master's Program Coordinator. Downloadable forms for MS students can be found at https://graduate.unl.edu/academics/program-steps/masters-degree-steps-to-completion

Action / Form*	Use	When to Submit	Signatures Required	Procedure
Guidance Interview & Specialization affiliation Submission Form	The guidance interview is instructive for registering for classes, explaining Specialization-specific procedures and addressing general questions. The student commits to follow Specialization guidelines.	During the 1st week	Faculty Advisor or Specialization representative	The student meets with the potential advisor and/or the Specialization representative to the Graduate Committee (plus other Specialization faculty if required).
Master's Examining Committee	Designating a Faculty Advisor and forming a Committee must be done before the end of the first academic year. The MS Committee is charged with determining the formal course program and monitoring the student's progress.	Last day of classes in 1st academic year	Faculty Advisor and Graduate Chair	The Committee members must be approved by the SBS Graduate Committee. A minimum of three committee members required (at least one must be an SBS Graduate Faculty). Once the committee is approved, the student must meet with the Examining Committee at least once a year.
Change in Master's Examining Committee	Should the Faculty advisor or other member remove themselves from the committee, submit a memo to the SBS Graduate Chair with the new committee make-up. **(Written Memo)**	As needed	Faculty Advisor New committee member	The new Committee Member(s) must be approved by the SBS Graduate Committee.
Annual Report	Graduate students meet with committee members at least once a year. This report summarizes the academic & research progress in a given academic year. Shows dates and results of annual committee meeting. Additionally, it indicates if the IDP discussion with took place.	1st day of fall semester	Committee Members Faculty Advisor	Forms are distributed late in the spring semester. **Failure to submit the annual report constitutes grounds for dismissal. See section on Annual Reports and Academic Performance in page 6.**

<u>Memorandum of Courses</u>	The courses needed to complete an "Option A" Master's degree. To be determined by Faculty Advisor & Examining Committee following Specialization recommendations.	Last day of classes in 1st academic year This must be filed prior to completion of over one-half of required coursework.	Faculty Advisor Graduate Chair Graduate Studies Dean	Minimum of **30** semester hours of credit. ✓ **20-24** semester hours of course work, excluding seminars and P/NP courses ✓ **6-10** semester hours of thesis hours ✓ **8** semester hours must be taken in courses consisting of 900-level or 800-level with no 400 counterpart. **No more than 3 cr of seminar courses with substantial coursework may be counted in this category.** ✓ At least one-half of the credit hours required for the degree, including thesis, must be in the major
Final Examination Form	After all coursework has been completed and any outstanding incompletes have been removed.	At least **four** weeks prior to the final oral examination. **Submit to Graduate Admissions Coordinator**	Faculty Advisor Graduate Chair Graduate Studies	Complete Parts 1 - 5, have the Grad Admissions Coordinator verify, Graduate Program Director signs, and then form is submitted to Graduate Studies. Graduate Studies return the form prior to the Oral Defense.
Oral Comprehensive Exam	Thesis Defense, Cannot be waived.		No signatures needed.	$25.00 non-refundable fee

Master of Science Degree Program Requirements

MS students in EEB and GCMB

MS Examining Committee: This committee must be formed by the student by the end of the first academic year and must meet at least annually to discuss and evaluate the student's progress. It is the student's responsibility to call meetings with his/her/their supervisory committee. The MS Examining Committee must have three members, and at least one member must be a budgeted SBS Graduate Faculty member.

MS Memorandum of Courses: Students must submit their Memorandum of Courses (which includes all courses to be completed before the degree is granted prior to completion of over one-half of required coursework.) by the end of their first academic year. Typically, students discuss their Memorandum of Courses with their Examining Committee at their first committee meeting.

Final Oral Exam: The student presents a public talk describing his/her/their thesis research. A closed-door examination by the Examining Committee follows. The student passes the Final Oral Exam if no more than one member of the Examining Committee votes to fail the student. The Faculty Advisor will notify the Graduate Committee in writing of the outcome. If the student fails the examination, a written description of what the student must do before taking another exam must be filed with the Graduate Committee (see Graduate Catalog for more details).

Link to Graduate Catalog

https://catalog.unl.edu/graduate-professional/policies/academic-program-requirements/#text

Master's Degree Steps to Completion:
https://graduate.unl.edu/academics/program-steps/masters-degree-steps-to-completion

Summary of Procedures for the PhD Degree

*All forms and reports should be submitted to the Doctoral Programs Coordinator.
Downloadable forms for PhD students can be found at
https://graduate.unl.edu/academics/program-steps/doctoral-degree-steps-to-completion

Action / Form*	Use	When to Submit	Signatures Required	Procedure

Guidance Interview & Specialization affiliation Submission Form	The guidance interview is instructive for registering for classes, explaining the Specialization specific procedures and general questions. The student commits to follow Specialization guidelines	During the first week of classes	Faculty Advisor or Specialization representative	The student meets with the potential advisor and/or the Specialization rep to the Graduate Committee (plus other Specialization faculty if desired)
Supervisory Committee, **Designate Advisor**	Designates the Faculty Advisor and forms the Supervisory Committee. The Supervisory Committee is charged with determining the formal course program, following Specialization recommendations, and monitoring the student's progress.	Last day of classes in the 1st academic year	Faculty Advisor Graduate Program Director Graduate Studies Dean	Committee members must meet the following requirements: 5 members, at least two must be SBS graduate faculty members; one 'outside representative' must be affiliated to a unit other than SBS. Once the committee is approved, student and Supervisory Committee must meet within three weeks, to establish a Program of Studies. **Student and Committee must meet at least once each year.**

Program of Studies If a change needs to be made after the form is submitted the advisor must email Graduate Studies and the Graduate Coordinator.	The courses needed to complete a PhD To be determined by Faculty Advisor & Supervisory Committee, following Specialization recommendations	Last day of classes in 1st academic year	Faculty Advisor Graduate Studies Dean	Minimum credit = 90 hrs. At least 45 credit hours must be completed at UNL after filing the form. Normally includes 35-45 cr hrs. of graduate coursework (minimum of 35 credits) and 45 - 55 hours of dissertation research. Typically, 6-9 cr hrs. of coursework (Up to 12 maximum) may be transferred from a master's degree previously awarded at another institution. A maximum of 6 seminar credit hours (e.g., BIOS 915) may be included. Supervisory Committee (following Specialization guidelines) determines if a language or special research tool is needed. Submit form to SBS Graduate Coordinator, to be forwarded to Graduate Studies.
Annual Report	Graduate students meet with committee members at least once a year. This report summarizes the academic & research progress in a given academic year. Shows date and result of annual committee meeting. Additionally, it indicates if the IDP discussion with took place.	Annually on the 1st day of fall semester	Committee Members Faculty Advisor	Forms are distributed late in the spring semester. The form will need to be completed each year the student is in the program. **Failure to submit the annual report constitutes grounds for dismissal. See section on Annual Reports and Academic Performance in page 5.**
PhD Comprehensive Examination	The Supervisory Committee will administer the written comprehensive. Format follows NIH or NSF grant proposal.	By the end of the 8th semester but is encouraged to be completed earlier when coursework in Program of Studies is complete.	Faculty Advisor writes a memo to the Graduate Committee to pass on the result of the exam.	Individual Supervisory Committees may additionally require an oral Comprehensive Exam also.

Admission to Candidacy	After the Comprehensive Exam is graded and all language and research tool requirements satisfied, the Supervisory Committee recommends admission to Candidacy.	Generally, after passing the Comprehensive exam at the end of the third year (at least 7 months prior to dissertation defense)	Complete Application for Admission to Candidacy form. Supervisory Committee signs.	Following Admission to Candidacy the student must register for at least one credit hour during each academic semester until the Degree is received, even if the number of dissertation hours on the program of studies has been reached. Failure to register will result in termination of the Candidacy.
Final Oral examination	The student presents a public talk about the salient results of the thesis research. Closed-door oral examination with the Supervisory Committee follows.	During the semester in which graduation is planned	Supervisory committee signs	Presentation should be advertised and open to the public.
Application for Advanced Degree	In order to graduate.	The beginning of the semester in which graduation is planned. Deadlines vary per semester.	No signatures needed.	$25.00 non-refundable fee

Doctorate Degree Program Requirements

PhD students in EEB and GCMB

PhD Supervisory Committee: This committee must be formed by the student by the end of the first academic year, and must meet at least annually to discuss and evaluate the student's progress. It is the student's responsibility to call meetings with his/her/their supervisory committee.

The PhD supervisory committee must have five members (including the primary advisor), and at least two members must be budgeted SBS Graduate Faculty and one member must be external to SBS. Current graduate studies policy stipulates that the external member is a UNL faculty member affiliated with a department other than SBS. A faculty member from another institution may serve as the external member, but non-UNL faculty must be certified by the SBS Graduate Committee and Graduate Studies (see Graduate Studies Catalog for procedures to appoint adjunct committee members).

PhD Program of Studies: Students must submit their Program of Studies to the SBS Grad Committee by the end of their first academic year. The Program of Studies lists all courses that must be completed before the degree is granted, as well as any Research Tool (e.g., computer language or statistical expertise) required by the Supervisory Committee. Typically, students discuss their Program of Studies at the first meeting of their Supervisory Committee.

PhD Comprehensive Exam: PhD students must take their Comprehensive Exam by the end of their eighth semester, and they are encouraged to take this exam by the beginning of their 3rd year. The exam is administered by a minimum of four members of the student's Supervisory Committee and examines the student's breadth of knowledge and understanding as it pertains to his/her general research area. This evaluation is intended to assess the student's capacity to design and implement a dissertation-level project.

The exam will have two portions:

Written Portion: The student will write a proposal using a NIH or NSF grant proposal format. The student will propose three research topics from which their Supervisory Committee picks one. The expectations for the exam need to be clearly communicated in writing to the student. The proposal should be 8-10 pages long (single spaced, not including references), and should include a lay abstract (max 300 words). The written proposal will be provided to the Supervisory Committee no later than two weeks prior to the scheduled oral component of the exam.

Oral Portion: The oral exam will cover focal areas identified *a priori* by the members of the Supervisory Committee and more specific questions relating to the written portion of the exam. Upon request, each member of the Supervisory Committee will provide focal areas of questioning and/or reading materials for the oral exam no later than four weeks prior to the exam.

Immediately following the oral portion of the exam, each member of the Supervisory Committee will vote to pass or fail the student. A majority vote is required for the student to pass. The Faculty Advisor will notify the Graduate Committee in writing of the outcome. If the student fails the examination, a

second chance will be offered within 6 months. A second failure will be grounds for dismissal from the PhD program.

Admission to Candidacy: Once the student completes his/her/their research tool (if any) and passes his/her/their Comprehensive Exam he/she/they advances to candidacy. The Candidacy form is typically completed at the Comprehensive Exam.

PhD Final Oral Examination: The student presents a public talk describing his/her/their dissertation research. A closed-door examination by the Supervisory Committee follows. The student passes the Final Oral Exam if no more than one member of the Supervisory Committee votes to fail the student. The Faculty Advisor will notify the Graduate Committee in writing of the outcome. If the student fails the examination, a written description of what the student must do before taking another exam must be filed with the Graduate Committee (see Graduate Catalog for more details).

Link to Graduate Catalog

https://catalog.unl.edu/graduate-professional/policies/academic-program-requirements/#text

Doctoral Degree Steps to Completion:
https://graduate.unl.edu/academics/program-steps/doctoral-degree-steps-to-completion

SBS Graduate Research Specializations 2024-2025

Ecology, Evolution & Behavior (EEB)
Faculty: Drs. Brassil, Cressler, DeLong, Fritz, Gardner, Hebets, Keesey, Lyons, Meiklejohn, Montooth, Pilson, Russo, Shizuka, Storz, Tenhumberg, Wagner, Woodman, & Zink
Grad Comm Reps: Dr. Meiklejohn (Dr. Pilson interim)

Courtesy: Drs. Bevins, Hoagland, Leger, Powell, Powers, Reinhard, Stevens & Wedin

Genetics, Cellular and Molecular Biology (GCMB)
Faculty: Drs. Angeletti, Atkin, Blum, Cerutti, Chia, Christensen, Couch, Hanson, Herman, Hiatt, Li, E. Moriyama, H. Moriyama, Riekhof, Sexton, Weaver, Weber, Yu, C. Zhang & L. Zhang
Grad Comm Reps: Dr. Li

Courtesy: Drs. Andrews, Baenziger, Barletta, Benson, Black, Buan, Ciobanu, Clemente, Cui, DiRusso, Fernando, Fromm, Goodman, Hallen-Adams, Herman, Herr, Hutkins, Izard, Ladunga, Mitra, Mower, Osorio, Pattnaik, Petersen, Petro, Ramer-Tait, Riethoven, Schachtman, Staswick, Stone, Van Etten, Walia, Wiebe, Wilson, Xiang & Zhou

Graduate Program Director: Dr. Tenhumberg

Definitions

Faculty – Faculty budgeted in either SBS (EEB and GCMB)

Courtesy – UNL faculty budgeted in a Department other than SBS (for EEB and GCMB). These faculty may serve as faculty advisor to SBS (EEB and GCMB)) students.

Ecology, Evolution and Behavior (EEB)
Specialization Requirements

The EEB Specialization is composed of faculty members that share interests in ecological and evolutionary processes. Research interests include: animal cognition, aquatic ecology, behavioral ecology, biodiversity, ecotoxicology, evolutionary biology, evolutionary ecology, evolutionary genetics and genomics, evolutionary physiology, parasitology, phylogenetics, physiological ecology, population and community ecology, and theoretical ecology.

Our goal is to develop broadly trained biologists that have both the conceptual tools and expertise necessary to address fundamental ecological and evolutionary research questions. To meet this goal, our graduate curriculum includes a list of suggested core courses for first year students as well as a list of additional courses. Seminars and discussion groups relating to more specialized research areas are frequently offered by EEB Faculty.

Requirements

Students are expected to attend either the EEB seminar (BIOS 915E) or the GCMB seminar (BIOS 915A) in each semester that they are in residence on the UNL campus. Students may register for up to six of those and include them in the program of studies. The EEB seminar meets weekly, and presentations may include seminars by external speakers and/or EEB students, post docs, or faculty presenting proposed, in progress, or completed work. In addition, MS and PhD defense talks may be given at the EEB seminar. Students are required to present in BIOS 915E every year. In addition, students who receive SBS Special Funds are required to present a poster at the BGSA Symposium the following year.

Suggested Coursework

The coursework for individual students will be tailored to their research interests and should be determined primarily by the student's Supervisory Committee. However, the following three core courses are recommended for all EEB students and would serve the students best if taken in their first year in the program.

Class	Credit Hours	Typically Offered
Bios 803 – Principles of Evolution	3	F
Bios 804 – Principles of Behavioral Ecology	3	S
Bios 805 – Principles of Ecology	3	S

In addition, each student, in consultation with his/her/their Supervisory Committee, will determine which additional coursework is appropriate. Some regularly offered courses include:

Class	Credit Hours	Typically Offered
Bios 829 – Phylogenetic Biology	4	F - alternate years
Bios 854 – Ecological Interactions	3	S - alternate years
Bios 897 – Evolutionary Genomics/Population Genetics		Variable
Bios 953 – Advanced Population Ecology		Variable
Bios 955 – Behavioral Ecology		Variable
Bios 959 – Advanced Community Ecology		Variable
Bios 960 – Biosystematics and Nomenclature	3	S - alternate years
Bios 962 – Animal Communication	3	S - alternate years
Bios 924 – Molecular Phylogenetics	3	Variable
Stat 801 – Statistical Methods	4	Variable
Stat 802 – Experimental Design		Variable
Bios 856 – Mathematical Models in Biology	3	F
Bios 877 – Bioinformatics	3	S
Bios 951 – Quantitative	3	S - alternate years
Psyc 941 – Fundamentals of Research Design and Data Analysis I	3	Variable
Psyc 942 – Fundamentals of Research Design and Data Analysis II	3	Variable
NRES 803 – Ecological Statistics	4	Variable

*This reflects historical patterns and not necessarily future offerings. The Department cannot guarantee when and if a class will be offered.

Additional Expectations

The EEB Specialization expects its graduate students to participate in all the activities that are designed to enhance their education, training, and interactions with each other and the Specialization faculty. These activities include interacting with visiting speakers and participation in the Biology Graduate Student Association (BioGSA) annual student symposium. Students are required to present in the EEB seminar every year. In addition, students who receive SBS Special Funds are required to present a poster at the BioGSA Symposium the following year.

Genetics, Cell, and Molecular Biology
Specialization Requirements

The GCMB Specialization is composed of faculty members that share interests in Genetics, Cell and Molecular Biology. Research areas are diverse, and include: cell biology, molecular genetics, microbiology, virology, immunology, biochemistry, bioinformatics, animal/plant pathology, genetics, genomics, systems biology, and molecular evolution.

Our goal is to develop broadly trained biologists that have both the conceptual tools and expertise necessary to address fundamental research questions in cell and molecular biology. To meet this goal, our graduate curriculum includes a list of suggested core courses for first year students as well as a list of additional courses. Additionally, GCMB faculty frequently offer seminars and discussion groups relating to more specialized research areas.

Requirements

Students are expected to attend either the EEB seminar (BIOS 915E) or the GCMB seminar (BIOS 915A) in each semester that they are in residence on the UNL campus. Students may register for six of those and include them in the program of studies. The GCMB seminar meets weekly, and presentations may include seminars by external speakers and/or GCMB students, post docs, or faculty presenting proposed, in progress, or completed work. In addition, MS and PhD defense talks may be given at the GCMB seminar.

Suggested Coursework

The coursework for individual students will be tailored to their research interests and should be determined primarily by the student's Supervisory Committee. Three of the following core courses are recommended for all GCMB students and would serve the students best if taken early in their program.

Class	Credit Hours	Typically Offered*
BIOS 807 Biology of Cells and Organelles	3	S
BIOS 818 Advanced Genetics	3	F
BIOS 820 Molecular Genetics	3	S
BIOS 827 Practical Bioinformatics Laboratory	3	S
BIOS 877 Bioinformatics and Molecular Evolution	3	S

In addition, each student, in consultation with his/her/their Supervisory Committee, will determine which additional coursework is appropriate. Some regularly offered courses are listed below.

1. Genetics, Genomics, and Molecular Biology Related Courses

Class	Credit Hours	Typically Offered*
BIOS 802 Cancer Biology	3	F,S
BIOS 807 Biology of Cells and Organelles	3	S
BIOS 812 Human Genetics	3	F
BIOS 818 Advanced Genetics	3	F
BIOS 820 Molecular Genetics	3	S
BIOS 945 RNA Biology	3	F - alternate years
BIOS 998 Special Topics: Epigenetic Regulatory Mechanisms	3	F - alternate years
BIOC/BIOS 831 Biomolecules & Metabolism	3	F,S
BIOC/BIOS 832 Gene Expression and Replication	3	F,S
BIOC/BIOS 839 Survey of Biochemistry	3	Variable
CHEM/BIOS 932 Proteins	2	F
CHEM/BIOS 933 Enzymes	2	F
CHEM/BIOS 934 Genome Dynamics and Gene Expression	3	F
VBMS/BIOS 964 Signal Transduction	3	S – alternate years

2. Bioinformatics, Molecular Evolution, and Systems Biology Related Courses

Class	Credit Hours	Typically Offered*
BIOS 826 Computational Systems Biology	3	F
BIOS 827 Practical Bioinformatics Laboratory	3	S
BIOS 828 Perl Programming for Biological Applications	3	F Variable
BIOS 829 Phylogenetic Biology	4	F
BIOS 856 Mathematical Models in Biology	3	Variable
BIOS 877 Bioinformatics and Molecular Evolution	3	S
BIOS 924 Molecular Phylogenetics	4	Variable
BIOS 942 Genetics, Genomics, and Bioinformatics of Prokaryotes	3	F - alternate years
ASCI 832 Genome Analysis	3	S
ASCI 896 Statistical Genomics	3	S, Variable
LIFE 891 Life Sciences Research: Integrating quantitative computational approaches	3	F,S
STAT 801 Statistical Methods in Research [general statistics]	4	F,S
STAT 842 Computational Biology	3	F
STAT 843 Next-Generation Sequencing and Systems Biology	3	S

3. Microbiology Related Courses

Class	Credit Hours	Typically Offered*
BIOS 840 Microbial Physiology	3	F
BIOS 843 Immunology	3	F
BIOS 844 Geomicrobiology	3	F
BIOS 897 Special Topics: Fungal Genetics and Cell Biology	3	Variable
BIOS 940 Microbial Diversity	3	Variable
BIOS 947 Industrial Microbiology and Biotechnology	3	F - alternate years
BIOS 950 Medical Molecular Virology	3	F - alternate years
BIOS 966 Advanced Viral Pathogenesis	3	F - alternate years
BIOS 998 Special Topics: Viral Oncology	3	S - alternate years
AGRO/BIOS 847 Soil Microbiology	3	S
AGRO/BIOS 963 Genetics of Host-Parasite Interaction	3	Variable
FDST 805/BIOS 845 Food Microbiology	3	F
FDST 806/BIOS 846 Food Microbiology Laboratory	2	F
FDST 855 Microbiology of Fermented Foods	2	S
FDST 855L Microbiology of Fermented Foods Laboratory	1	S
FDST 908 Topics in Advanced Food Microbiology	Variable	Variable
PLPT 867 Plant Associated Microbes	4	S - alternate years
VBMS/BIOS 841 Pathogenic Microbiology	3	S
VBMS 852 Molecular Virology and Viral Pathogenesis	3	F - alternate years
VBMS 951 Advanced Molecular Infectious Diseases	3	S

4. Plant Biology Related Courses

Class	Credit Hours	Typically Offered*
BIOS 825 Plant Biotechnology	3	F - alternate years
BIOS 871 Plant Systematics	4	S
BIOS 878 Plant Anatomy	4	F - alternate years
BIOC/BIOS 834 Plant Biochemistry	3	Variable
AGRO/BIOS 810 Plant Molecular Biology	3	S
AGRO 919 Plant Genetics	3	F - alternate years

*This reflects historical patterns and not necessarily future offerings. The Department cannot guarantee when and if a class will be offered.

Additional Expectations

The GCMB Specialization expects its graduate students to be involved in all the activities that are designed to enhance their education, training, and interactions with each other and the Specialization faculty. These activities include interacting with visiting speakers and participating in the Biology Graduate Student Association (BGSA) annual student symposium, and attending other research forums, such as the SBS and Center for Biotechnology Seminar Series, Plant Science Innovation Symposium, Nebraska Center for Virology Symposium, etc.