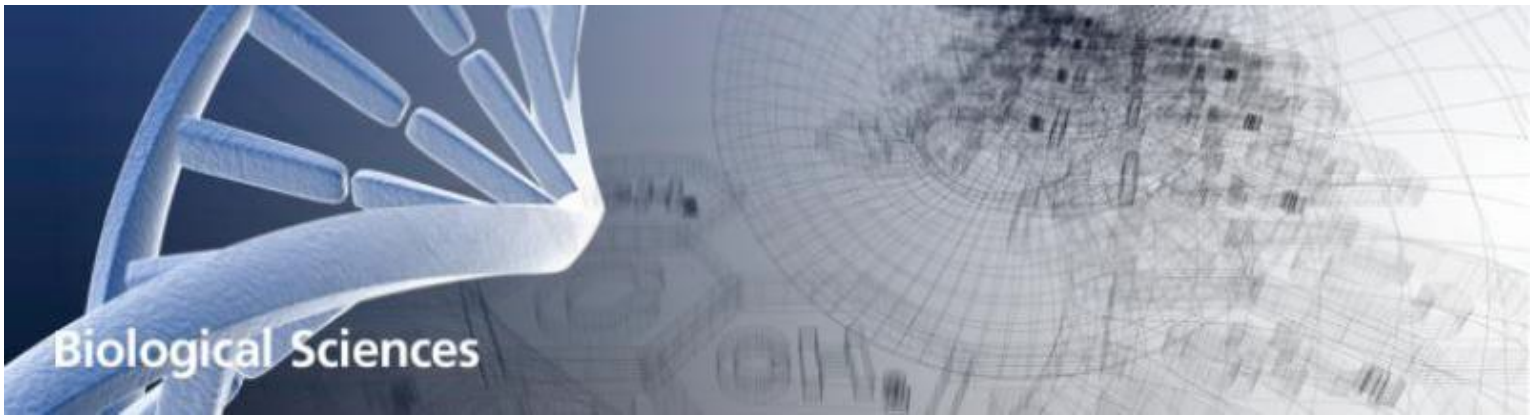


Department of Biological Sciences

**Graduate Student Handbook
for the M.S. and Ph.D. Programs
2017-2018**

Contents

1. Graduate Degree Programs in Biological Sciences	p. 3
2. Overview of the Masters (M.S.) Program in Biology	p. 4-5
3. Overview of the Doctoral (Ph.D.) Program in Biology	p. 6-7
4. Application Process for Graduate Program	p. 8-9
5. Biology Graduate Program Policies	p. 10-12
6. Welcome to the Graduate Program	p. 13
7. Cell & Molecular graduate program	p. 14-15
8. Ecology & Evolution graduate program	p. 16-17
9. M.S Thesis Committee and Exam requirements	p. 18-20
10. Ph.D. Thesis Committee and Exam requirements	p. 21-25



Graduate Degree Program in Biological Sciences at the University of Denver

The Department of Biological Sciences provides opportunities for graduate training at the Doctoral (Ph.D.) or Masters (M.S.) level. The graduate program involves a combination of course work, lab or field research and a defended thesis. Students begin their thesis research under the direction of a faculty member during the first year. Students also have the opportunity to participate in teaching undergraduate courses.

Research Areas:

The Ph.D. and M.S. programs are centered on primary research that coincides with faculty experience and expertise. Students will conduct their research in a university environment using state-of-the-art techniques and facilities. Current research emphases are:

- **Cell & Molecular Biology** (biophysics, neuroscience, cell signaling and physiology, developmental biology, molecular forensics and molecular evolution) is supported by major research facilities that include automated DNA sequencers, real-time PCR instruments, a DNA WAVE HPLC, MALDI-TOF mass spectrometer, a Hitachi transmission electron microscope, and an Olympus Fluoview 1000 confocal microscope.
- **Ecology, Biodiversity & Evolution** (biogeochemistry, conservation biology, restoration ecology, molecular evolution) takes advantage of unique field study sites that include an alpine research station on Mt. Evans in the Arapaho National Forest and collaborative research opportunities with the Denver Botanic Gardens and the Rocky Mountain Center for Conservation Genetics & Systematics.

Biological Sciences
Department of Biological Sciences
F.W. Olin Hall, Room 102
2190 E. Iliff Avenue
Denver, CO 80208
303-871-3661
<http://www.biology.du.edu>

Master of Science (M.S.) Program in Biology

Program Overview:

The M.S. degree in Biological Sciences involves a combination of course work and original research. A major strength of the Masters program is the emphasis on research. Nearly all students publish their work in scientific journals. Thus, students completing the M.S. degree are in a strong position to pursue a range of postgraduate opportunities, including careers in biotech and academic labs, government labs or agencies, or continued studies in professional or Ph.D. programs.

The M.S. degree requires two years of research and course work. Students begin their research with a faculty advisor upon entrance into the program. In consultation with the advisor and Thesis Committee, the student develops a plan for an independent research project that culminates with a written thesis, public seminar, and oral thesis defense.

Financial Support:

Students typically are provided full tuition waiver and 9-month stipend via graduate teaching assistant (GTA) or graduate research assistant (GRA) positions for their two years. Most students work extensively on their thesis research in the summer between the first and second year with support from their faculty advisor's research grants.

Requirements for completion of the M.S. degree:

The major requirements for completion of the M.S. degree are 45 quarter hours of graduate course work and successful defense of the M.S. thesis.

Course work:

For the M.S. degree 45 quarter hours are required. Up to 10 quarter hours of graduate course work may be accepted as transfer credit with approval of the Departmental Graduate Committee and the Office of Graduate Studies. Transfer of credits must occur in the first quarter of enrollment. However, credits may only be transferred if they are being applied to a higher level degree than the degree the credits were applied towards (Eg., credits applied to a MS degree at another institution may not be applied towards earning a MS at DU). Credit transfer guidelines are listed on page 20 of the Graduate Studies Policy Manual (<http://www.du.edu/media/documents/graduates/policy.pdf>). The 45 quarter hours include a combination of course work and research credit.

Thesis Advisory Committee:

The student's Thesis Advisory Committee must be selected **before the end of the second quarter** of enrollment.

- The M.S. Thesis Committee must consist of the major professor and two other regular faculty members of the Department of Biological Sciences who have been selected by the student in consultation with the major professor.
- Regular Committee meetings are required. The responsibilities of the Committee include:
 - a) approval of the student's course program;
 - b) guidance in the student's research project;
 - and c) administration of thesis defense exam.

Research & Thesis:

A research project is designed in consultation with the major advisor and Thesis Committee. The degree requires a written thesis, public seminar, and oral defense. The expectation is that the research be novel and appropriate for publication in a peer reviewed scientific journal.

General Expectations:

Graduate students must maintain a minimum GPA of 3.0 and make adequate progress on research as assessed by the major advisor and Thesis Committee. All graduate students are required to attend all departmental seminars. Attendance at seminars is only excused for teaching conflicts. In addition, students supported by a GTA position are expected to fulfill all obligations required of the GTA appointment.

Doctoral (Ph.D.) Program in Biology

Program Overview:

The Ph.D. degree in Biology involves a combination of course work and original research. Students have research opportunities using state-of-the-art techniques and facilities. Students also have extensive opportunity for teaching in a variety of undergraduate teaching labs. The Ph.D. typically requires 4 to 5 years of research and course work. Students begin their research with a faculty advisor upon entrance into the program. In consultation with the advisor and Thesis Committee, the student develops a plan for an independent research project that culminates with a written thesis, public seminar, and oral thesis defense.

Financial Support:

Students typically are provided full tuition waiver and 9-month stipend via GTA or GRA positions. Most students work extensively on their thesis research in the summer and on academic breaks, and they are supported by their faculty advisor's research grants during the summer.

Requirements for completion of the Ph.D. degree:

The major requirements for completion of the Ph.D. degree are 90 quarter hours of graduate course work and research credit, completion of all candidacy exams, and successful defense of the Ph.D. thesis.

Course work:

For the Ph.D. a total of 90 quarter hours are required. Up to 15 quarter hours of graduate credit (or a blanket transfer of 45 quarter hours if a Master's degree had been earned prior to enrolling in our PhD program) may be accepted as transfer credit with approval of the Departmental Graduate Committee and the Office of Graduate Studies. The 90 quarter hours include a combination of course work and research credit. Learn more by downloading the [Ph.D. Biology Advising Sheet](#).

Thesis Advisory Committee:

The student's Thesis Advisory Committee should be selected by the student in consultation with the major professor. The Committee must be formed **before the end of the second quarter** of enrollment.

- The Ph.D. Committee must consist of the major professor and three other regular faculty members of the Department. A member may be from another academic unit or institution provided that they have a doctoral (or equivalent) degree. Assignment of an outside committee member requires approval from the Departmental Graduate Committee and Graduate Studies.
- Regular Committee meetings are required. The responsibilities of the Committee include:
 - a) approval of the student's course program;
 - b) guidance in the student's research project;
 - c) administration of candidacy exams and thesis defense exam.

Advancement to Candidacy:

Ph.D. students are required to pass both the Qualifying Exam and Research Proposal Exam to advance to candidacy. Failure to complete exams by the required deadlines may result in loss of GTA support and/or dismissal from the program. Learn more about the [Ph.D. Candidacy Exams](#).

Research & Thesis:

A research project is designed in consultation with the major advisor and Thesis Committee. The degree requires a written thesis, public seminar, and oral defense. The expectation is that the research be novel and appropriate for publication in a peer reviewed scientific journal.

General Expectations:

Graduate students must maintain a minimum GPA of 3.0 and make adequate progress on research as assessed by the major advisor and Thesis Committee. All graduate students are required attend all departmental seminars. Attendance at seminars is only excused for teaching conflicts. In addition, students who are supported by a GTA position are expected to fulfill all obligations required of the GTA appointment. After passing the proposal defense, students are strongly encouraged to present a **departmental seminar** annually, except in the final year when the dissertation defense will count as the seminar.

Application for Ph.D. or M.S. Graduate Program in Biology

Students seeking admission into the graduate program should have an undergraduate degree in the Biological Sciences or a related discipline.

Review of applications for consideration for Fall quarter admissions (September 1 start date) begins in the prior January. For favorable consideration for acceptance and GTA support, applicants must have ALL material outlined below submitted by **January 1**. Applications may be submitted later, but GTA support for the following September may no longer be available.

Application for graduate study in Biology involves several important steps. Prospective students must submit an on-line application to the University of Denver, Office of Graduate Studies at <http://www.du.edu/grad/appinfo/info.html>. Detailed application instructions and the application forms can be obtained on the Office of Graduate Studies website. Within this website the graduate programs for the Department of Biological Sciences can be found within the College of Natural Sciences & Mathematics.

1) Online Application

To submit an [online application](#) click on "Apply for Admission" and select your degree, college, major and concentration (if applicable). International students, please see additional instructions on the Graduate Studies website. A printable confirmation page will appear after successful submission.

- **Letters of Recommendation** from THREE different faculty members or other professional contacts who are familiar with your potential to complete a research-based graduate degree.

Letter of recommendation requests are sent to your recommender via email within one business day of the submission of your online application. You will be asked to provide names and email addresses of individuals who will be writing your recommendations. Please ensure you have accurate email addresses for your recommenders prior to submitting your application. We suggest you let your recommender know the recommendation request will be coming from the University of Denver in advance. This will allow him/her to send a letter electronically and meet the application deadline if applicable.

- **Essay/Personal Statement**

A personal statement of at least 300 words is required. The Essay/Personal Statement should be uploaded electronically and attached to your online application before submission.

- **Application Fee**

There is a \$60 **nonrefundable** application fee, which covers the cost of processing application materials. Applications will not be considered for admission until this fee is paid.

2) Graduate Record Exam (GRE)

Applicants must request that Educational Testing Services (ETS) to forward results to the University of Denver Office of Graduate Studies. The institution code for the University of Denver is R4842. Application to the M.S. and Ph.D. programs requires the General (aptitude) GRE exam.

For information concerning GRE registration please visit www.gre.org or contact:

Graduate Record Examination
Educational Testing Service
P. O. Box 6000
Princeton, NJ 08541-6000
(609) 771-7670

Applicants should take the entrance exam well in advance of their intended application date. Please allow at least 14 business days for your general test scores to be received. Entrance exam scores older than five years from the date of the application may not be acceptable for admission.

3) Proof of English Proficiency (international students only)

All internationally-educated students (except those educated in English speaking countries) must provide proof of English proficiency. Minimum English proficiency requires a TOEFEL score of 550, iBT of 80, or IELTS of 6.0. For students seeking GTA positions, additional spoken English proficiency must be demonstrated through testing: a minimum score of 26 on TOEFL speaking subsection of iBT, 8 on IELTS, or 50 of TSE (for paper-based TOEFL).

4) Transcripts

Applicants are required to submit one official transcript from each post-secondary institution they have attended, or are presently attending, where two quarter hours (or one semester hour) or more were completed. This includes transcripts for credit earned as transfer work, study abroad and college credit earned in high school.

An official transcript must include the original signature of the registrar and/or the seal of the issuing institution, and must be enclosed in an envelope with the stamp or signature of the registrar across the sealed flap. Proof of a bachelor's and master's degree (if applicable) is required from a regionally accredited college or university. All credentials submitted become property of the University of Denver and cannot be copied or returned to the student or any person(s).

Mailing transcripts and any additional items to:

University of Denver
Office of Graduate Studies
Mary Reed Bldg., Room 5
2199 S. University Blvd.
Denver, CO 80208-4802

Only after your application packet is complete will the file be forwarded from the Office of Graduate Studies to the Department of Biological Sciences for review and consideration for admission.

Biology Graduate Program Policies

General guideline & requirements

To remain in the graduate program, all students must be in good standing. This includes meeting requirements for academic progress and GTA commitments and making satisfactory research progress. **Failure to meet these requirements may result in dismissal from the program.**

A. Academic standing & general requirements:

1. All students accepted on provisional status must meet requirements for regular standing by the end of their first quarter.
2. All students must maintain a minimum GPA of 3.0. A "C" grade in a graduate level class is considered unsatisfactory. Such grades contribute towards graduation requirements, but may be cause for an evaluation of student progress by the thesis advisory committee. If a student earns a second grade of "C" or lower in a graduate level class the thesis advisory committee is strongly encouraged to meet to discuss remedial plans and evaluate student progress in the program.
3. All students must form a Graduate Committee prior to the end of their second quarter.
4. Ph.D. students must complete qualifying exams and research proposal by the appropriate deadlines.
5. All students are required to attend **all** Departmental seminars throughout their entire course of study. The only exceptions are conflicts with scheduled GTA assignments.

B. Registration & credit hours:

1. All students must be registered for **8** credit hours to maintain full time status.
2. Students supported by a GTA are provided tuition for **8** credit hours per quarter (24 credits per academic year). The student **must** make sure they are registered for the appropriate number of credits while on GTA. When registering for the final quarter to fulfill credit-hour requirements, students should only register for the number of credit hours to fulfill the required credit hours (45 M.S.; 90 Ph.D.). For PhD students only, **no classes (other than BIOL 5995: Independent Research) may be taken during the final quarter of partial credits** – please make sure all requirements are fulfilled prior to the final credit quarter. PhD students should also submit the Continuous Enrollment form at this time (available from the Office of Graduate Studies).
3. Students who have met their credit-hour requirement for their degree (45 M.S.; 90 Ph.D.) can use a continuous enrollment form instead of maintaining full-time status. See the graduate studies web site (<http://www.du.edu/grad/current-students/index.html>).
4. All course work must be according to the current advising sheets. **Exceptions must be approved by both the Thesis Committee and Departmental Graduate Committee.**

C. GTA obligations & requirements:

Students with GTA positions are provided a full tuition waiver and will be paid a 9-month academic stipend. GTAs will be assigned to a Biology course during each of the 3 quarters of the academic year. The course assignment and general information will be supplied by the laboratory

coordinators or Biology Office. Once assigned to a course, the GTA should contact the lab coordinator or instructor of the course. The instructor will provide information about the teaching schedule including when the class/lab meets, but may also include weekly “prep” meetings between lab assistants and the course instructor. The GTA duties for the quarter will be provided at this meeting. It is important that the GTA and the course instructor are clear on teaching obligations and expectations. In general, graduate teaching assistants are expected to devote 20 hours per week to their teaching assignments (this is in addition to time devoted to course work and thesis research). **Failure to perform all required GTA duties can put GTA support in jeopardy.**

D. Research progress & obligations:

1. All students must organize a Thesis Advisory Committee.
 - The student's Thesis Advisory Committee should be selected by the student in consultation with the major advisor.
 - The committee must be formed before the **end of the second quarter** of enrollment.
 - The responsibilities of the Thesis Committee include, but are not limited to: a) approval of the student's course program; b) guidance in the development and progress of the student's research project; and c) administration of all required exams.
2. The student must meet with their committee by the end of the second quarter to discuss any possible exceptions or additional course work.
 - If the committee approves any substitutions or waivers in required course work, the student and advisor must submit the request to the Departmental Graduate Committee for final approval.
 - Records of all thesis committee meetings and any correspondence with the departmental graduate committee must be maintained in the students file in the Biology office.
3. The student is strongly encouraged to have one to two committee meetings per year to assess research progress.
 - All Thesis Committee meeting proceedings must be documented by a memo summarizing decisions and members present or absent. This documentation must be maintained in the graduate student's file in the Biology office along with the up-to-date M.S./Ph.D. Advising Sheet.
4. Progress must be made in the student's research. This is assessed by discussion between student and advisor and Thesis Committee.
 - Progress includes both experimental results and effort.
 - In general, winter interterm and summer break are the best opportunity to make significant research progress.
 - Students and advisors should make clear the expectations for research during academic breaks.
 - An advisor may resign from sponsoring a student at anytime. Resignation by the advisor will lead to a meeting of the Graduate Committee to decide on a course of action. Available options include:

- i. Giving a student 30 days to find a new advisor and lab. Failure to find an advisor within that time period will lead to termination from the program.
- ii. Permitting the student to write a thesis towards a M.S. degree, dependent on finding a suitable advisor to oversee the thesis process.
- iii. Termination from the program for unsatisfactory performance in research and/or teaching duties.
- iv. A course of action to be determined by the Graduate Committee.

The decisions by the Graduate Committee may be appealed to the Chair of the Department. Subsequent appeals will be considered by the Dean of Natural Sciences and Mathematics and the Associate Provost of Graduate Studies.

- 5. Breaches of ethical conduct (falsification of data, plagiarism, harassment, etc.) may be grounds for immediate termination from the program.

E. Financial support:

- 1. Students are supported by either a GTA or GRA position.
- 2. GTA support includes full tuition waiver and 9-month stipend.
 - Summer stipend for students on GTA is to be negotiated between advisor and student. Most students work full-time in the summer on their research and are supported by their advisor's research grants.
 - There are a very limited number of summer GTA positions available (they provide stipend only).
- 3. Full GRA support includes tuition waiver and stipend.
 - The student needs to recognize that this financial support is provided by their advisor's research grants, and continued GRA support is contingent upon good academic standing, research progress, and available funds.

F. Unforeseen problems & conflicts

- 1. In general, attempts to mitigate conflicts should be conducted by discussion among the parties involved. If a student and advisor find themselves in disagreement on the status, effort and progress related to research, they are encouraged to hold a Thesis Committee meeting to arrive at a mutually agreeable resolution.
- 2. If a student feels a thesis committee meeting will not or has not arrived at an acceptable resolution, he or she can contact any member of the Departmental Graduate Committee for guidance as to how to proceed.

Welcome to the Department of Biological Sciences

One of the greatest differences between graduate training and your undergraduate training is that you are now, in many ways, responsible for your own success. In particular, you are responsible for taking care of all of the requirements for your degree and for anticipating and meeting related deadlines within the department and within the university. Your progress in course work and research is documented by your M.S./Ph.D. Advising Sheet (links to these advising sheets are available online at <http://www.biology.du.edu/degrees/grad/handbook/>). Be sure to download and print copies of this form. You must keep the official copy with all updates in your graduate student folder that is maintained in the Biology office. You can access your current sheet or update your file by asking the administrative assistant in the biology office. Do not assume that your advisor is updating your file. It is your responsibility to maintain your advising sheet and updates or addendums. The University graduate office is very strict about such documentation.

Things to do in your first week:

- 1) Visit the Biology Office, located in the OLIN 102.
 - Introduce yourself to the departmental administrative assistants and fill out any necessary forms. Chances are there will be some tax forms related to your salary.
 - Obtain the appropriate lab and building keys (as directed by your advisor).
 - Ask that your name and email address be added to the departmental distribution list used to communicate about seminars and special events.
 - Remember that, in general, the administrative assistants are a good source of information about who to contact regarding questions you may have.
- 2) If you are a GTA, find out to what course you have been assigned; this information can be supplied by the lab coordinators or the Biology Office.
 - Contact the lab coordinators for your schedule and specific obligations including meeting and teaching times, but may also include weekly “pre-lab” meetings between lab assistants and the course instructor. The instructor will inform you of your duties for the quarter.
 - Consult your advisor about which courses to register for during the first quarter. This must be done before Friday of the first week of classes.
 - Familiarize yourself with the full content of the Graduate Student Handbook.

Graduate Program Track: **Cell and Molecular Biology (PhD Students)**

ALL students will be required to attend ALL **departmental seminars** throughout their entire graduate training.

ALL students are STRONGLY encouraged to attend **lunch meetings with seminar speakers** throughout their entire graduate training.

The students will complete their written and oral **qualifying exam** before the end of their 4th academic quarter.

The **research proposal exam** will be completed within one year of passing their qualifying exam.

After passing the research proposal exam, students are strongly encouraged to present a **departmental seminar** annually, except in the final year when the dissertation defense will count as the seminar.

Coursework:

Graduate Core Courses: all required **9 credits**

__Yr 1 Fall	BIOL 4212	Adv. Molecular Biology (3 cr)
__Yr 1 Winter	BIOL 4211	Adv. Cell Biology (3 cr)
__Yr 1 Spring	BIOL 4213	Adv. Cell Signaling (3 cr)

Professional Development Tool Requirements: both required **3 (5) credits**

_____Yr 1 Fall	BIOL 4090	Biostatistics (4 cr) or BIOL 4085 Accelerated Biostatistics (2 cr)
_____Yr 1 Winter	BIOL 4231	Responsible Conduct in Research (1 cr)

Foundations in Literature: total of 3 required **6 credits**

These courses are modeled after "journal clubs" using a set of papers chosen by faculty for presentation and discussion by students.

__(Taken anytime)	BIOL 4310	Foundations in Literature: Cell & Molecular
__(most likely Yr 2)		Biology (2 cr)

Total required class credit hours for program **18 (20) credits**

The remainder of the course credit hours may consist of elective 3000/4000-level courses (requires thesis committee recommendation) and research credit hours.

BIOL 4995	Independent Research (before preliminary advancement to candidacy)
BIOL 5995	Independent Research (after preliminary advancement to candidacy)

Overall total credit hours required for PhD degree **90 credits**

Graduate Program Track: **Cell and Molecular Biology (MS Students)**

ALL students will be required to attend ALL **departmental seminars** throughout their entire graduate training.

ALL students are STRONGLY encouraged to attend **lunch meetings with seminar speakers** throughout their entire graduate training.

(If the MS student does not graduate within the typical 2 years, then the student will be required to present a **departmental seminar** annually, except in the final year when the dissertation defense will count as the seminar.)

Coursework:

Graduate Core Courses: any **TWO** of the following **6 credits**

__ Yr 1 Fall	BIOL 4212	Adv. Molecular Biology (3 cr)
__ Yr 1 Winter	BIOL 4211	Adv. Cell Biology (3 cr)
__ Yr 1 Spring	BIOL 4213	Adv. Cell Signaling (3 cr)

Professional Development Tool Requirements: both required **3 (5) credits**

_____ Yr 1 Fall	BIOL 4090	Biostatistics (4 cr) or BIOL 4085 Accelerated Biostatistics (2 cr)
_____ Yr 1 Winter	BIOL 4231	Responsible Conduct in Research (1 cr)

Foundations in Literature: total of **3** required **6 credits**

These courses are modeled after "journal clubs" using a set of papers chosen by faculty for presentation and discussion by students.

_____ Taken anytime _____ (most likely Yr 2)	BIOL 4310	Foundations in Literature: Cell and Molecular Biology (2 cr)
---	------------------	---

--

Total required class credit hours for program **15 (17) credits**

The remainder of the course credit hours may consist of elective 3000/4000-level courses (requires thesis committee recommendation) and research credit hours.

BIOL 4995 Independent Research

Overall total credit hours required for MS degree **45 credits**

Graduate Program Track: **Ecology & Evolution (MS Students)**

ALL students will be required to attend ALL **departmental seminars** throughout their entire graduate training. Exceptions are only made for teaching or when a student must be in the field or out of town for research.

ALL students are **STRONGLY** encouraged to attend **lunch meetings with seminar speakers** throughout their entire graduate training.

(If the MS student does not graduate within the typical 2 years, then the student will be required to present a **departmental seminar** annually, except in the final year when the dissertation defense will count as the seminar.)

Coursework:

Graduate Core Courses: all required

Statistics: (additional statistics courses may be required as determined by the student's dissertation committee, and would be taken as electives)

_____ Yr 1 Fall **BIOL 4090 Biostatistics** (4 cr) **3 (5) credits**
 or BIOL 4085 Accelerated Biostatistics (2 cr)

_____ Yr 1 Winter **BIOL 4091 Research Methods** (1 cr)
 (taught as sequel to BIOL4090 Biostatistics course)

Ecology & Evolution Seminar: total of **1** required **2 credits**
(combined didactic and journal club style course)

_____ (anytime) **BIOL 4220 Ecology & Evolution Seminar** (2 cr)

Professional Development Tool Requirements: **1 credit**

_____ Yr 1 Winter **BIOL 4231 Responsible Conduct in Research** (1 cr)

(The BIOL 4090 Biostatistics course listed above is also part of the tool requirement)

Foundations Literature: all **3** required **6 credits**

These courses are modeled after "journal clubs" using a set of papers chosen by faculty for presentation and discussion by students. In a given quarter, the emphasis would be on Biodiversity, Ecology or Evolution.

_____ Yr 1 or 2 **BIOL 4330 Foundations in Lit: Ecology & Evolution I** (2 cr)

_____ **BIOL 4331 Foundations in Lit: Ecology & Evolution II** (2 cr)

_____ **BIOL 4332 Foundations in Lit: Ecology & Evolution III** (2 cr)

Total required class credit hours for program **12 (14) credits**

The remainder of the course credit hours may consist of elective 3000/4000-level courses (requires thesis committee recommendation) and research credit hours.

BIOL 4995 Independent Research

Overall total credit hours required for MS degree **45 credits**

M.S. Thesis Committee requirements

The student's Thesis Advisory Committee must be selected before the **end of the second quarter** of enrollment. The **M.S. committee** must consist of the major advisor and two other regular faculty members of the Department of Biological Sciences who have been selected by the student in consultation with the major professor. The committee approves the student's course program and acts as the Thesis Committee and conducts the thesis defense exam. The student is strongly encouraged to have one to two committee meetings per year to assess research progress. Any thesis committee meeting must be documented by a memo summarizing decisions and members present or absent. This documentation must be maintained in the graduate student's folder in the biology office.

YR/quarter

____ / ____

Thesis Advisory Committee Members

Thesis Defense Examination and Graduation

During the quarter prior to that which the student intends to defend their thesis, the student must acknowledge the intention to graduate by submitting an *Application for Graduation Form* to the Office of Graduate Studies.

An oral examination is required in defense of the thesis. The exam is concerned primarily with the thesis or research project but may include such other information in the major field as is pertinent. The Oral Defense is undertaken by the candidate's Thesis Committee and an Outside Chairperson (selected by student and advisor) who represents the Office of Graduate Studies and is not considered a voting member of the committee. The Master's committee is comprised of a minimum of two and a maximum of five voting members.

The oral examination must be held at least three weeks before the end of the term in which the degree is to be granted. Students must submit a completed *Schedule of Oral Exam Form* to the Office of Graduate Studies and their academic unit no later than three weeks prior to the date of the examination. All members of the oral examination committee must receive a copy of the candidate's thesis at least two weeks prior to the scheduled examination.

Students are responsible for meeting all the required deadlines and thus should consult the Office of Graduate Studies website for appropriate deadlines for graduation (<http://www.du.edu/grad/gradinfo/graduation.html>).

Ph.D. Thesis Committee Requirements

The student's Thesis Advisory Committee must be selected by the student in consultation with the major professor. The committee must be formed by the **end of the second quarter** of enrollment. The **Ph.D. committee** must consist of the major advisor and three other regular faculty members of the Department. A member can be from another academic unit or institution provided they have a doctorate. Assignment of an outside committee member requires approval from the Departmental Graduate Committee and the Graduate School. The committee approves the student's course program, conducts exams and acts as the Thesis Committee and conducts the final thesis defense. The student is strongly encouraged to have one to two committee meetings per year to assess research progress. Any thesis committee meeting must be documented by a memo summarizing decisions and members present or absent. This documentation must be maintained in the graduate student folder in the biology office.

YR/quarter

Thesis Advisory Committee Members

____/____

Record of Examinations for Ph.D. Candidates

Name: _____ Date started in program: _____

Advisor: _____

Qualifying Examination

(To be taken before the end of the 4th academic quarter in the program for CMB students)

(To be taken before the end of the 5th academic quarter in the program for EE students, to allow for Fall field work)

Written exam Date answers returned to committee _____

Oral exam Date of exam _____ Outcome: Pass / Conditional Pass/ Fail

If conditional pass, please document the conditions on this document

If failed, Retest allowed: Yes / No

Date of retest _____ Outcome: Pass / Fail

Committee members:

Research Proposal Examination

(To be taken no later than one year after completion of Qualifying Exam)

Date of exam _____ Outcome: Pass / Conditional Pass/ Fail

If conditional pass, please document the conditions on this document

If failed, Retest allowed: Yes / No

Date of retest _____ Outcome: Pass / Fail

Committee members:

Guidelines for Ph.D. Biology Candidacy Exams

Each Ph.D. student will be required to take the following examinations:

1. **Qualifying Examination**- A qualifying examination will be administered to the doctoral student by the Thesis Advisory Committee. **The entire exam must be completed prior to the end of the 4th academic quarter in the program for CMB students, and by the end of the 5th academic quarter in the program for EE students (to allow for the Fall field work season).** The doctoral student will schedule with the thesis committee the **written and oral exam dates at least two months prior to the oral exam date.** The qualifying examination will consist of written and oral sections, according to the following format:
 - a. One month prior to written exam date, the Thesis Advisory Committee will provide to the student on **specific topics or areas of biology** for which the student will be held responsible. Students should familiarize themselves with the background and current theories in the selected topic areas, as represented in the primary literature, during the interval between topic selection and the receipt of the written exam.
 - b. **Written Exam**- the written exam will be composed of **one question** from each Thesis Committee member. If necessary, an additional general question approved by the entire Committee may be assigned. However, it is anticipated that most exams will be comprised of four questions.
 - The major advisor will arrange for review of the questions by the Committee to minimize overlap or ambiguity. Members may establish certain guidelines for the student, but should try to make the exercise a learning experience.
 - The student will have **one week** to formulate and present printed responses to the questions. The student may consult with Committee members to clarify questions and focus, but shall not consult with anyone else. In addition, the student must properly reference any written materials used.
 - After completion of the exam, the Thesis Committee will have one week to complete a **preliminary** evaluation of the exam responses. While each question will be evaluated by the member who submitted the specific question, the entire set of exam responses will be read by the entire Committee.
 - The written exam is not graded *per se*. A final grade by each examiner (pass/conditional pass/fail) will be assigned at the end of the oral exam.
 - c. **Oral Exam**- Typically, the oral exam will be scheduled **one week after the student has turned in the written exam.** The oral examination will test the student's ability to think, answer questions, and analyze data. In addition, the oral exam should allow the student to respond to any incomplete or less-than-satisfactory responses from the written examination. One goal of the oral exam is to make sure that the student is confident with knowledge, able to communicate that knowledge clearly, and comfortable with the fact that advanced learning at the doctoral level is an open-ended process.
 - At the end of the exam, each examiner will vote pass/fail. Each examiner may vote based solely on the consideration of their designated question, or on the entirety of the exam. **The student must receive a pass from a majority of the committee (for example, three of the four examiners on a standard committee).** Students may receive a "Conditional Pass" vote with a requirement to perform remedial work to address a specific deficiency. This deficiency must be met within one year as assessed by the Thesis Committee. Students who receive a "Fail" vote may proceed in one of 3 ways. Entirely at

the discretion of the Thesis Committee, major advisor (and upon approval of the departmental Graduate Committee), the student may (1) retake the exam **after at least 3 months of additional preparation**, (2) pursue defending a M.S. thesis, or (3) be terminated from the graduate program. The qualifying exam must be completed within six months of first attempting to pass the exam.

2. **Research Proposal Examination**- After passing the qualifying exam, the doctoral student becomes eligible to take the research proposal exam. The research proposal examination will be taken **no more than 12 months after passing the qualifying exam**.
- The research proposal exam will consist of an oral defense of a written, scholarly proposal concerning the student's research that is expected to lead to the Ph.D. thesis.
 - The written proposal must be submitted in the format of a grant proposal generally following **NIH predoctoral grant proposal guidelines**.
 - The proposal will be submitted to the Thesis Advisory Committee **at least two weeks prior to the oral defense** of the proposal.

The purpose of the oral defense of the proposal is to determine whether the doctoral student is sufficiently knowledgeable and capable of the level of scientific thinking necessary to perform independent, publishable research. Questions will focus on the student's knowledge of subjects pertinent to the research proposal. Efforts will be made to determine whether or not the doctoral student can interpret scientific data, ask scientific questions, formulate working models, and design workable experiments to answer the scientific questions. The doctoral student will be expected to be familiar with the appropriate scientific literature.

At the end of the exam, each examiner will vote pass/fail. **The student must receive a pass from a majority of the committee (for example, three of the four examiners on a standard committee)**. Students may receive a "Conditional Pass" vote with a requirement to perform remedial work to address a specific deficiency. This deficiency must be met within one year as assessed by the Thesis Committee. Students who receive a **"Fail" vote may proceed in one of 3 ways**. Entirely at the discretion of the Thesis Committee, major advisor (and upon approval of the departmental Graduate Committee), the student may (1) retake the exam **after at least 3 months of additional preparation**, (2) pursue defending a M.S. thesis, or (3) be terminated from the graduate program.

On passing the research proposal exam please email the Chair of the Graduate Committee in charge of current students (Shannon Murphy) so that the Advancement to Candidacy forms are filed.

3. Dissertation Defense Examination and Graduation-

During the quarter prior to that which the student intends to defend their dissertation, the student must acknowledge the intention to graduate by submitting an *Application for Graduation Form* to the Office of Graduate Studies.

An oral examination is required in defense of the dissertation. The exam is concerned primarily with the dissertation or research project but may include such other information in the major field as is pertinent. The Oral Defense is undertaken by the candidate's Thesis Committee and an Outside Chairperson (selected by student and advisor) who represents the Office of Graduate Studies and is not considered a voting member of the committee. The Ph.D. oral exam committee is comprised of a minimum of four and a maximum of seven voting members.

The oral examination must be held at least three weeks before the end of the term in which the degree is to be granted. Students must submit a completed *Schedule of Oral Exam Form* to the

Office of Graduate Studies and their academic unit no later than three weeks prior to the date of the examination. All members of the oral examination committee must receive a copy of the candidate's dissertation at least two weeks prior to the scheduled examination.

Students are responsible for meeting all the required deadlines and thus should consult the Office of Graduate Studies website for appropriate deadlines for graduation (<http://www.du.edu/grad/gradinfo/graduation.html>).