Department of Ecology and Evolution

Graduate Student Handbook
2021-2022
THE DEPARTMENT OF ECOLOGY & EVOLUTION

Department Staff

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Office</th>
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<th>Email</th>
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<tbody>
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Office of Graduate Affairs
Biological Sciences Division (BSD)

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<tr>
<th>Position</th>
<th>Name</th>
<th>Office</th>
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<tbody>
<tr>
<td>Dean/Director of Grad. Affairs</td>
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Fax Machine for student use is located in:

Zoology 114 (Office hours only) 702-9740
### Faculty, Department of Ecology & Evolution

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<thead>
<tr>
<th>Name</th>
<th>Title</th>
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<tbody>
<tr>
<td>Stefano Allesina, Ph.D.</td>
<td>Professor, Ecology &amp; Evolution Department Chair, Ecology &amp; Evolution</td>
<td>Committee on Evolutionary Biology</td>
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<tr>
<td>Luis Bettencourt, Ph.D.</td>
<td>Professor, Ecology &amp; Evolution Pritzker Director of the Mansueto Institute for Urban Innovation</td>
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<tr>
<td>Cara Brook, Ph.D.</td>
<td>Assistant Professor, Ecology &amp; Evolution</td>
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<tr>
<td>Meredith Cenzer, Ph.D.</td>
<td>Pathways to Independence Instructor, Ecology &amp; Evolution</td>
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<tr>
<td>Sarah Cobey, Ph.D.</td>
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<tr>
<td>Greg Dwyer, Ph.D.</td>
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<tr>
<td>Martin Kreitman, Ph.D.</td>
<td>Professor, Ecology &amp; Evolution</td>
<td>Committee on Genetics, Genomics &amp; Systems Biology*</td>
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<tr>
<td>Marcus Kronforst, Ph.D.</td>
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<tr>
<td>Seppe Kuehn, Ph.D.</td>
<td>Assistant Professor, Ecology &amp; Evolution</td>
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<tr>
<td>Manyuan Long, Ph.D.</td>
<td>Edna Papazian Distinguished Service Professor, Ecology &amp; Evolution</td>
<td>Committee on Evolutionary Biology Committee on Genetics, Genomics &amp; Systems Biology Committee on Microbiology</td>
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<td>John Novembre, Ph.D.</td>
<td>Professor, Human Genetics Professor, Ecology &amp; Evolution</td>
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<tr>
<td>Mercedes Pascual, Ph.D.</td>
<td>Louis Block Professor, Ecology &amp; Evolution</td>
<td>Committee on Evolutionary Biology</td>
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<tr>
<td>Catherine Pfister, Ph.D.</td>
<td>Professor, Ecology &amp; Evolution</td>
<td>Committee on Evolutionary Biology*</td>
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<tr>
<td>Trevor Price, Ph.D.</td>
<td>Professor, Ecology &amp; Evolution</td>
<td>Committee on Evolutionary Biology Committee on Genetics, Genomics &amp; Systems Biology</td>
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<tr>
<td>John Reinitz, Ph.D.</td>
<td>Professor, Statistics Professor, Ecology &amp; Evolution Professor, Molecular Genetics &amp; Cell Biology</td>
<td>Member, Institute of Genomics &amp; Systems Biology*</td>
</tr>
<tr>
<td>Name</td>
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<tr>
<td>Matthias Steinruecken, Ph.D.</td>
<td>Assistant Professor, Ecology &amp; Evolution</td>
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<tr>
<td>Joseph Thornton, Ph.D.</td>
<td>Professor, Ecology &amp; Evolution</td>
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<td></td>
<td>Professor, Human Genetics</td>
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<tr>
<td>J. Timothy Wootton, Ph.D.</td>
<td>Professor, Ecology &amp; Evolution</td>
<td>Committee on Evolutionary Biology*</td>
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**EMERITUS FACULTY**

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<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Jerry Coyne, Ph.D.</td>
<td>Professor Emeritus, Ecology &amp; Evolution</td>
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<td>Committee on Genetics, Genomics &amp; Systems Biology*</td>
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<tr>
<td>Richard Hudson, Ph.D.</td>
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<td>Committee on Genetics, Genomics &amp; Systems Biology*</td>
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<tr>
<td>Wen-Hsiung Li, Ph.D.</td>
<td>Professor Emeritus, Ecology &amp; Evolution</td>
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<tr>
<td>Manfred Ruddat, Ph.D.</td>
<td>Associate Professor Emeritus, Ecology &amp; Evolution</td>
<td>Associate Dean of Students in the College*</td>
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<tr>
<td>Chung-I Wu, Ph.D.</td>
<td>Professor, Ecology &amp; Evolution</td>
<td>Committee on Evolutionary Biology</td>
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*denotes faculty member, Biological Sciences Collegiate Division
THE DEPARTMENT OF ECOLOGY & EVOLUTION

The Department of Ecology & Evolution provides training for research and teaching in the ecology, evolution and behavior of whole organisms, primarily at the level of the organism, the population, and the ecosystem. The research interests of our faculty include molecular evolution, population genetics, quantitative genetics, animal behavior, plant and animal ecology, theoretical and disease ecology, evolutionary theory, and related subjects. Individual levels of study range from molecules to communities. A common theme is the conduct of studies in a rigorous quantitative and conceptual context, and all faculty share an interest in the architecture of populations, species, and communities.

The Department stresses scientific breadth, and the interrelations between various specialized fields. Students are encouraged to approach basic biological problems with the most appropriate techniques: computational, mathematical, observational, field, bench, or genomic. Departmental laboratories are equipped for a wide variety of contemporary research methods. Courses given in other departments may be taken for credit in Ecology & Evolution, for example, in the Departments of Organismal Biology and Anatomy, Biochemistry and Molecular Biology, Molecular Genetics and Cell Biology, Statistics, Geophysical Sciences, Anthropology, and Chemistry. Many students in the Department of Ecology & Evolution participate in interdepartmental programs in genetics, cell biology, developmental biology, population biology, and evolutionary biology, and in these programs dissertation research may be co-sponsored by faculty from different departments.

The Department manages the University of Chicago’s Greenhouse, located on the roof of the Biological Sciences Learning Center, as well as the Warren Woods Ecological Field Station in Three Oaks, MI. It also collaborates with the Field Museum and the Shedd Aquarium for students interested in research in systematics, taxonomy, and evolutionary biology, the Brookfield Zoo for basic research in conservation and behavior involving zoo animals, Argonne National Laboratory for terrestrial systems and microbial genomics research, and the Woods Hole Marine Biological Laboratory. Ecology & Evolution students also may pursue possibilities for field studies around the world.

The Department has a regular seminar series, with invited speakers from around the country, as well as across the globe. There are also a number of more informal seminars each week, and graduate students have a weekly Friday afternoon meeting of their own. Graduate students are expected to attend all departmental seminars as their schedule allows.

There are many opportunities for teaching experience in undergraduate and graduate courses, and this is regarded as a required part of the graduate training program, not merely a source of financial gain.
Remote Learning in a time of COVID-19

Due to the unprecedented impact of COVID-19, autumn quarter classes at the University of Chicago will be conducted either fully online, or using a hybrid model that allows for limited in-person class meetings, by utilizing building space that can safely accommodate learning while maintaining social distancing.

Additionally, UChicago and the Biological Sciences Division have created a number of webpages and online resources to help you:
- develop and strengthen your skills with remote learning;
- stay up-to-date on public health information relating to COVID-19, research safety, and campus health and well-being;
- familiarize yourself with campus supports and resources

We encourage you to explore these resources. If you have any questions, please do not hesitate to reach out to the Director of Graduate Education, or the Graduate Education Administrator, for assistance.

A few very useful sites to get you started:
- UChicago Forward (https://goforward.uchicago.edu/) – Planning the Resumption of Programs and Operations on Campus
  This site provides up-to-date information on university heath requirements related to COVID-19, status of campus building, FAQs, planning updates for research and educational activities, as well as links to recent town halls and more.
- Coronavirus updates (https://coronavirusupdates.uchicago.edu/) – Information on coronavirus safety, travel planning and restrictions, Autumn Quarter 2021 plans, public health information, and details on how to protect yourself.
- Learning Remotely (https://learningremotely.uchicago.edu/) – This site includes basic information on tools used in remote instruction and accessing training; developing learning strategies tailored to your learning style; learning resources – within and outside the classroom – to support remote learning; FAQs addressing common questions.

IMPORTANT: Before Arriving on, or Returning to, Campus

Each member of the UChicago community is required to attend an online COVID-19 training program and acknowledge via an online form that they will comply with the University’s COVID-19 health requirements.

Following are links to help you complete required action, in order to be able to come to campus:
- Access COVID safety training and complete electronic COVID Heath Requirements form (https://goforward.uchicago.edu/health-requirements/)
- Download the UChicago Health Pact PDF
STUDENT GUIDELINES

General Timetable for the Ph.D. Program in Ecology & Evolution

Most students in the Department of Ecology & Evolution complete their Ph.D. program in six years or less, though students entering with Masters degrees may finish earlier. All students in the BSD are guaranteed funding support for five years as long as they are in good academic standing.

The first and second years consist largely of coursework and individual reading courses, aiming toward successful completion of the General Knowledge Examination (GKE) by the Spring quarter of the first year of study, and defense of a dissertation research proposal by the end of the second year of study. Work in subsequent years shifts to dissertation-centered research and, finally, preparation and defense of the Ph.D. dissertation. While there is no M.S. program in Ecology & Evolution, students may elect to receive the M.S. degree upon successful completion of their dissertation proposal defense.

General Departmental Information

The Department of Ecology & Evolution is housed in the Zoology Building and Erman Biology Center. The Department office is located in Zoology 114. The Office of Graduate and Postdoctoral Affairs for the Division of the Biological Sciences is located in Room 104 of the Biological Sciences Learning Center (BSLC), 924 E. 57th Street.

The University Registrar is located on the first floor of the University of Chicago Press building, 1427 E. 60th Street. The Office of the Bursar is located in the Edlestone building, 6030 S. Ellis Avenue. The Chicago Card and Dissertation Offices are located in Regenstein Library.

Most administrative matters concerning graduate study are coordinated through the Director of Graduate Education (Audrey Aronowsky, Zoology 210; cell 773-701-8797) and the Graduate Education Administrator (Marcy J. Hochberg, Culver 401; cell 773-851-7061). These staff members coordinate registration, student progress reports, fellowships, programming, and most other graduate student concerns, in addition to distributing information on courses, summer programs, outreach opportunities, etc.

All Ecology & Evolution students have office space, shared with other graduate students, in one of the Department's buildings. Incoming graduate students are assigned office space as soon as possible after arrival on campus. Once in a lab, the student’s advisor will provide office and/or lab space.

Ecology & Evolution students are allocated annual research funds, for a maximum of five years, in an expense account administered by the Department office in Zoology 114; students have $500 for the 2021-22 academic year. Students may request research funds by submitting a brief email to the Department Chair (Stefano Allesina) and the Director of Graduate Studies (Marcus Kronforst). This account may be used for research and office supplies, conference travel, fieldwork supplies, computing equipment, books, etc. Unused expense account funds are carried over into the next academic year, but all funds must be spent before a student graduates. Please also note: If research funds are used to purchase a computer or other hardware and/or equipment, these items remain University property, and must be returned to the Director of Graduate Education or the Graduate Education Administrator, once the student graduates.
Almost all department communication is handled by email. Set up your account as quickly as possible after arrival, and give your email address to the E&E office right away (This usually has been done for you before you arrive, but confirm this!).

Keys for student offices, computer rooms, etc., are available from Linda Naunapper in the E&E Main Office. A refundable deposit of $20 is required for each key. *Any requests for keys to faculty laboratory space must be accompanied by a signed note from the faculty member.*

**Registration**

The University of Chicago is organized on a quarter system, and all E&E graduate students in the Division of Biological Sciences are registered for full-time study and/or research all four quarters (i.e., 12 months each year). Although some procedures change from quarter to quarter, and year to year, most graduate students will be expected to communicate with the Director of Graduate Education and the Graduate Education Administrator, as well as the BSD Graduate Affairs Office, four times every year, whether they are taking classes or conducting field work away from campus. Regardless of whether a student is taking courses, they must be registered for 300 units each quarter.

*Registration* is completed online through your my.uchicago.edu account. Each quarter, students will be notified of the dates for online registration. There is an internal Department deadline so student registration can be verified, *before* the University deadline.

- Students in their first two years meet quarterly with the Student Advisory Committee to obtain approval for their proposed registration. However, students can register online before their meeting with the Advisory Committee, then drop or add courses online in the first 3 weeks of the quarter.
- Students who have advanced to candidacy for the Ph.D. can proceed to register online (see below)

*Time Schedules* listing courses offered each quarter are available on the University Registrar’s website (registrar.uchicago.edu); you also can find information here on university deadlines, and tuition and fee schedules.

**Notes on Registration:**

**Subject Codes (places to look for relevant courses):**
- BIOS – Biological Sciences Collegiate Division
- BSDG – Biological Sciences Graduate Courses (Ethics, BSD TA Requirement, TA Training)
- ECEV – Department of Ecology and Evolution
- EVOL – Committee on Evolutionary Biology
- GEOS – Geophysical Sciences
- ORGB – Department of Organismal Biology and Anatomy
Courses with variable units, and sections for each instructor:
For the courses below, you must enter a section number for the particular instructor with whom you are working, and manually add the number of units (100-300). You must NOT use a section identified only as "staff"

49500 – teaching (not for BSD teaching requirement)
49700 – reading
49800 – research, off campus (use also with pro forma registration)
49900 – research, on campus

Regular graduate courses
Most graduate courses carry 100 units and the section number is 01

Change of registration
The Drop-Add period, during which you can change your course registration free of charge, is the first three weeks of each quarter. If you make changes to your schedule, please email either the Director of Graduate Education, or the Graduate Education Administrator, so the changes can be documented.

Degree application and graduation
If you want to receive a degree (Ph.D. or M.S.), you must apply for the degree online, through my.uchicago.edu, no later than the first week of the quarter in which you plan to receive the degree. If you don’t apply for a degree, you can’t receive the degree. Really. If something happens and you can’t finish the degree requirements in that quarter, notify the Director of Graduate Education or the Graduate Education Administrator as soon as possible so that you can be removed from the graduation list. You will need to submit a new application for the quarter in which you now plan to receive your degree.

If you’re not going to be in residence at UChicago
If you will be out of the Chicagoland area, please notify the Director of Graduate Education, and the Department office, in advance. We need to make sure that you’re in the right registration category. Usually, students who are not on campus at all, or more than 100 miles from campus for the quarter, are registered in a category called Pro Forma. This category has some restrictions, and tuition is greatly reduced, since you won’t be using University resources during that time. Please also register at traveler.uchicago.edu so the Department, and the University, can keep track of you should an emergency arise.

Late fees, payment deadlines, and restrictions
It is each student's responsibility to pay close attention to the published schedules of late fees and restrictions found on line at http://registrar.uchicago.edu. Any unpaid fee (library fines, activity fees, etc.) can cause a student's account to be restricted by the Office of the Bursar. Once a student is restricted, ID cards will not allow entry into University buildings, all privileges are lost at the library, and the student account will start to accrue late fees. Late fees are almost never removed, unless they were assessed because of a University administrative error. Schedules for fee and registration deadlines, along with late fee penalties, are published in each quarterly time schedule.
Other important things

Tuition, Stipends and Fees
All Ph.D. students in the Division of the Biological Sciences receive the same basic stipend support (2021-22: $34,000 stipend, plus basic health insurance, graduate student services fee). Each prospective student received a written financial aid offer as part of their admission reply form. Students who receive any tuition bills that contradict their understanding of the support agreement should notify the Director of Graduate Education or the Graduate Education Administrator.

Stipends are typically distributed online by the Bursar’s Office just prior to the start of a quarter. All students are strongly encouraged to set up a direct deposit to the personal bank account as soon as possible. Students receiving support from Divisional Unendowed (DU) funds, and certain departmental endowments or training grants in and after their 4th year, should expect to serve as a Lab TA for one quarter without remuneration, as part of their stipend. Please contact the Director of Graduate Education or the Graduate Education Administrator for more information.

Taxes
The stipend/fellowship you receive is considered taxable income. You are responsible for understanding your tax liability, or for seeking help in understanding IRS requirements. The University, the Office of International Affairs, and UChicagoGRAD, host regular workshops for domestic and international students. Information about quarterly estimated tax payments is posted on Financial Aid’s website (https://financialaid.uchicago.edu/quarterly-estimated-tax-payments). You are encouraged to direct tax questions to UChicagoGRAD staff by emailing gradhelp@uchicago.edu.

Biological Sciences Division professionalism requirement
All BSD graduate students must complete two terms of professional preparation, at least one of which must involve serving as a Teaching Assistant (TA) to a UChicago course. The second requirement may be met with another TA-ship, a Diversity, Equity & Inclusion (DEI) Assistantship (piloted in the 2021-22 academic year), or by taking the TA training course (BSDG 50000; which must be taken before the student serves as a TA).

Please note: all TAships and DEIships require prior approval from your dissertation committee or the SAC (as appropriate), to ensure they do not undermine ongoing progress towards the Ph.D. Guidelines and information are issued by the BSD Graduate Affairs Office every Autumn quarter. Please consult the OGPA website for information: https://biosciences.uchicago.edu/programs/professionalization

Biological Sciences Division ethics requirement
This requirement is based on the student’s time between matriculation and graduation, as follows: all BSD students must take an Ethics course every four years. Upper-level ethics courses are offered by, and open to, students in all programs in BSD.
Evaluation of good standing
In the first two years, student progress is evaluated by the Student Advisory Committee. In year 3 and beyond, the advisor and dissertation committee typically meet with the student twice per year, depending on the student’s year in the program. In the event that a student is not performing adequately or not making sufficient progress (via course grades, rotation grades, preliminary exams, and committee meetings [or lack thereof]), the student will be informed in writing of deficiencies, suggestions on how to remedy them, and a timeline for getting back on track. A student may be dismissed from the program if deficiencies are not remedied to the satisfaction of the Department Chair and Director of Graduate Studies.

Staying healthy
Myriad options are available at the University for students to stay physically, emotionally, and mentally healthy. Some online resources are listed below. When in doubt, make an appointment with the Director of Graduate Education or the Graduate Education Administrator to discuss available resources.

Physical Education and Athletics
http://athletics.uchicago.edu/im_clubs/index
http://athletics.uchicago.edu/facilities/ratner/index
http://athletics.uchicago.edu/facilities/hcfh/index
http://athletics.uchicago.edu/facilities/fitchicago
http://yoga.uchicago.edu/

Physical and Mental Health
http://studenthealth.uchicago.edu/
https://wellness.uchicago.edu/
http://counseling.uchicago.edu/page/our-services
http://counseling.uchicago.edu/page/virtual-pamphlet-collection
http://counseling.uchicago.edu/page/academic-skills-assessment-program
http://counseling.uchicago.edu/page/groups
http://grad.uchicago.edu/take_care_of_yourself/graduate_mental_health_resources/
THE DEPARTMENT OF ECOLOGY & EVOLUTION
Progress through the Doctoral Program

First Year – Incoming Students

Newly admitted students receive information from the BSD Office of Graduate and Postdoctoral Affairs (OGPA) during the summer. Included in this packet will be information regarding Autumn quarter orientation and registration dates, housing, etc. Incoming students should contact the Director of Graduate Education, and the Department, as soon as possible after arrival in Chicago. Incoming international students must also check in with the Office of International Affairs shortly after arriving.

Student Advisory Committee
All incoming students shall be scheduled for an initial discussion with the Student Advisory Committee (SAC) during Orientation Week. The purpose of this meeting will be to gain an understanding of the student's background and former training, to discuss the student's general and specific research interests, to introduce the student to the program in Ecology & Evolution, and to formulate an academic plan for the student's first year in residence. The SAC must approve each student’s choice of courses until the student passes the dissertation proposal defense her/his second year.

All E&E graduate students must meet the program’s distribution requirement, which consists of three Ecology and Evolution courses: either one course in Ecology and two in Evolution, or one course in Evolution and two in Ecology. Please be aware that not every Ecology or Evolution course fulfills this requirement. E&E students can check with the SAC, or with the Director of Graduate Education or the Graduate Education Administrator, to identify applicable courses that fulfill the distribution requirement.

If a student has post-B.S. experience, the SAC will recommend that the student proceed on an accelerated schedule through the early phase of her/his program. This enables the SAC to maintain an individualized Ecology & Evolution program while recognizing that more advanced students are expected to fulfill the general knowledge and proposal defense segments of candidacy more rapidly than students entering from college or switching fields.

The SAC will continue to meet with students individually, prior to registration for Winter and Spring quarters, to discuss their work to date and arrive at a specific course of study for each quarter. Before the start of Winter quarter, the SAC will notify the student regarding their Examination Committee for the General Knowledge Examination (GKE), which will be held no later than the 10th week of the Spring quarter. This committee will be arranged by the SAC, and generally will represent the topical areas in which the student has completed course work during the first year. In most cases, one member of each student’s Examination Committee will have been their instructor for one of the courses forming the basis of their GKE.

General Knowledge Examination (GKE)
Each incoming student will be expected to pass an oral General Knowledge Examination (GKE; preliminary exam) administered during the first year of study, and scheduled no later than the 10th week of the Spring quarter. The GKE session will be attended by all three members of an Examination Committee, constructed by the process outlined above. The goal of the GKE will be to assess each student's general knowledge of key concepts, processes, and issues in ecology and evolutionary biology, as covered in the courses completed during the first year. Please note: students must pass, or be in the process of passing, all three breadth requirement courses to qualify to take the GKE.
Each member of the Examination Committee will submit sample written questions, based upon content and materials in the areas covered in the applicable coursework. A copy of the sample questions will be distributed to the student at least one week before the GKE, and shall be used to initiate the examination. During the exam, the student should be prepared to explain models, equations, terminology, fundamental processes, references, and theory, as relevant to the questions. The written questions are a starting point, and the student should expect that s/he will be interrupted, led along tangents, and continue to be questioned until examiners hit upon a question or topical area where the answer is unknown. Three hours shall be allowed for the oral examination, after which the committee will discuss the student’s performance. The Examination Committee may make suggestions regarding further coursework, pre-proposal research, and plans for preparation of the dissertation proposal.

It is the responsibility of the Examination Committee to report, in writing, the results of the GKE to the Chair of the Department, the Director of Graduate Education, and the examined student, in a timely fashion. Possible results of the examination are:

1. **Pass.** The student is certified as having passed the general examination. The student can apply to become a candidate for the M.S. degree in Ecology & Evolution, and can continue in the Ph.D. program. Forms for application to admission to candidacy for the M.S. degree are available from the Director of Graduate Education or the Graduate Education Administrator. Students may apply for the M.S. after they successfully complete the defense of their Ph.D. Dissertation Proposal (usually Spring of the second year, see below).

2. **Conditional Pass.** The student is certified as having passed the general examination, contingent upon further specified coursework/individual reading with specific faculty in certain areas, according to a timetable for successful completion elaborated by the Examination Committee. When the student has fulfilled the additional requirements, as determined by the Student Advisory Committee and the Chair of the Department, the student shall be recommended for candidacy for the M.S. degree in Ecology & Evolution. Under no circumstances shall a student be permitted more than three additional quarters after the Examination to fulfill the requirements of the Conditional Pass.

3. **Fail.** The student has not passed the general examination. This decision must be explained in writing by the Examination Committee. The student may re-take the GKE during the Summer quarter. Continued financial aid for the Autumn quarter will be contingent upon successful performance in the GKE. No student shall be considered in good standing who has not successfully passed the General Knowledge Examination before the start of the Autumn quarter of the second year in residence.

**Matriculation in a quarter other than autumn**
In the rare case of students matriculating in quarters other than Autumn quarter, the Student Advisory Committee shall meet with the incoming student one week before the registration period for their first quarter of residency in the Ph.D. program. This meeting will have the same requirements as the Autumn quarter advisory meeting with the additional requirement that the SAC shall recommend, in writing, an individualized schedule for the completion of the General Knowledge Exam.

**Research opportunities**
Students should consult with the Student Advisory Committee, the Department Chair, the Director of Graduate Education, the Graduate Education Administrator, and other graduate students about pre-dissertation research opportunities and potential funding sources. Rotations are not required, but they are valuable, especially in the bench and computational sciences, for obtaining specific skills and getting to know a variety of lab management styles. Rotation forms should be filled out with the advisor and submitted to the Director of Graduate Education.
E&E faculty and staff members have associations with numerous field stations and sites in the United States and around the world. Students are encouraged to participate in coursework, discussion groups and seminar series in related departments at the University and affiliated institutions such as the Field Museum, Brookfield Zoo, Argonne National Lab, Woods Hole Marine Biological Lab, and other local universities.

Valuable pre-dissertation research should be accomplished during the Summer quarter between the first and second year of study. In fact, this summer is a critical stage for many students, as it is their first dedicated research time during the Ph.D. program. Students should begin investigating potential research opportunities early in their first year of graduate study. The Student Advisory Committee will discuss summer plans with students during the pre-spring advising meeting, to help them prepare to make the most of their first summer.

Funding for graduate research can be from large or small sources. All qualified students are expected to apply for an NSF pre-doctoral fellowship early in the Autumn quarter of their first or second year, depending on their eligibility. The Darwinian Sciences cluster runs a joint course to help first-year students prepare and submit these grant applications (ECEV 40100: Grants, Publications, Professional Issues). Smaller funding sources, such as the Hinds Endowment (administered by the Committee on Evolutionary Biology), can often be used to support pre-dissertation research. Information about these funds and forms for submitting proposals are available online (https://evbio.uchicago.edu/sites/default/files/client-wysiwyg-uploads/Hinds%20Fund_Award%20Payment%20Instructions_4-2019.pdf) or from the Graduate Education Administrator in Culver 401.

Other requirements
In addition to completing E&E distribution requirements, students are expected to attend the Monday departmental seminars each time they are offered, participate in the reading group related to their interests, and enroll in ECEV 40100 (Grants/Pubs/Professional Issues) if appropriate. All BSD students are required to enroll in BSDG 55100 (Rigorous and Responsible Research) in Winter Quarter of their first year. Students in the field sciences should be sure to communicate with the Office of Graduate Affairs if their field season will conflict with this course.

Second Year

The general goals of the second year of residence in Ecology & Evolution involve the acquisition of requisite knowledge and skills for the preparation for the Ph.D. proposal, preliminary research necessary for the proposal, and beginning participation in the diverse seminar and laboratory discussion groups active in the fields of Ecology & Evolution.

Students continue to meet with the Student Advisory Committee (SAC) on a quarterly basis during the second year, until they have successfully completed their dissertation proposal defense. However, students are encouraged to identify a primary academic advisor, and likely members of their Dissertation Proposal Committee, as early as possible in their tenure in the Department. The Dissertation Proposal Committee must consist of at least four faculty members, three of whom have primary or secondary appointments in the Department of Ecology & Evolution.
The student’s advisor will not chair their Committee; rather, the Dissertation Proposal Committee chair must be another faculty member with an appointment in Ecology & Evolution. Non-Departmental co-advisors may be permitted after consultation with the Department Chair. SAC members and the Director of Graduate Education are available to assist students in their selection of a primary advisor. Once students have identified an advisor, they are expected to consult with this advisor before the quarterly SAC meetings, thus beginning the transition from coursework to dissertation research.

A student whose advisor leaves the University may continue to have this person as an advisor for not more than one year following his or her departure. After one year, the student must select a new advisor with a University of Chicago appointment in the Department of Ecology & Evolution.

Dissertation Proposal Committee
Students are expected to have formed a committee for their dissertation proposal hearing no later than the 8th week of Winter quarter. Any student experiencing difficulty forming her/his committee should consult with the SAC and/or the Director of Graduate Education.

A Committee for the dissertation proposal defense will be officially formed by the Director of Graduate Education, in consultation with the student, when the student notifies the Director of Graduate Education in writing of his/her wish to schedule the dissertation proposal defense. The Dissertation Proposal Committee shall consist of four members, three of whom must have a University appointment according to the description above, and must be members of the Department of Ecology & Evolution. The Committee Chair also must have an appointment in Ecology & Evolution. (In extraordinary circumstances, this requirement may be altered by the Department Chair.)

Dissertation Proposal
At least 14 days before the proposal hearing, the student must:
1) Notify the Director of Graduate Education, in writing, of her/his intent to schedule a hearing on the dissertation proposal, and request that the Director of Graduate Education officially constitute the faculty committee, as listed, including the advisor;
2) Schedule the hearing room with the Department Secretary in Zoology 114; and
3) Provide the Director of Graduate Education with a near-final copy of the dissertation proposal to be defended, and a copy of the student's memo to the Director of Graduate Education (above). The student also must distribute the proposal to all members of the Dissertation Proposal Committee.

The written proposal, which should not exceed 5,000 words or 20 double-spaced pages (excluding tables, figure legends, references, etc.), should describe any preliminary results, the proposed research for all components of the dissertation, and its general significance, and should be in the format of a grant proposal.

When all requirements above have been accomplished, the Director of Graduate Education will notify all Department faculty of the dissertation proposal hearing. The Department will distribute notices inviting the University community if an informal public seminar is a part of the hearing.
Dissertation Proposal Hearing

Dissertation proposal hearings must be scheduled no later than Spring quarter of the second year of residence in Ecology & Evolution (normally the 7th quarter of residence). Only under exceptional circumstances will the Chair of the Department allow a student to defer the proposal defense until the Summer, or Autumn quarter of the 3rd year of residence. (All requests for such a delay must be made in writing to the Department Chair well before the end of the Spring quarter.) All students will be required to successfully defend their dissertation proposal by the end of the Autumn quarter of their third year (or the equivalent time span if they did not start in the Autumn), or their funding will be suspended until the requirement is fulfilled. There will be no retroactive reimbursement. Only a medical condition will be considered as a possibly acceptable cause for delaying the proposal hearing.

Consideration will be given to students whose advisors feel that a second year of field research is necessary for successful completion of the dissertation proposal. Students entering the Ph.D. program in Ecology & Evolution with extensive post-baccalaureate experience should prepare and defend a dissertation proposal by the 5th quarter of residence in the Ph.D. program.

Normally, the hearing consists of a public presentation of the proposed research followed by a period of questions and discussion. A subsequent closed session with the student and his/her Committee will be held, led by the Committee chair. All members of the Dissertation Proposal Committee should be present at the hearing. In extraordinary circumstances, the Chair of the Department may allow a committee member to be absent from the hearing. In such a case, the absent faculty member will be consulted for questions by the Chair of the Department.

The Chair of the Dissertation Proposal Committee will inform the Director of Graduate Education and Graduate Education Administrator, in writing, of the hearing results as soon as possible after the hearing.

The possible outcomes of the dissertation proposal hearing are as follows:

1) **Pass.** The student's dissertation proposal is approved by her/his Dissertation Proposal Committee in writing to the Chair of the Department of Ecology & Evolution. The hearing is considered to be the final examination for the M.S. in Ecology & Evolution. The Chair of the Proposal Committee shall communicate this decision in writing to the Chair of the Department and the Division of the Biological Sciences, on the appropriate forms. The student shall also be considered as having completed all Departmental requirements for candidacy for the Ph.D.

2) **Conditional Pass.** The student's dissertation proposal shall be conditionally approved, with qualifications communicated in writing to the Chair of the Department by the Chair of the Dissertation Proposal Committee. A written timetable for completion of further requirements shall be included, which will not extend beyond the 9th quarter of registration in the program (normally Autumn quarter of the 3rd year of residence). Fulfillment of the conditional requirements will qualify the student for the M.S. Degree in Ecology & Evolution, and recommendation for candidacy for the Ph.D.

3) **Fail.** The student's Dissertation Proposal Committee, with approval of the Chair of the Department of Ecology & Evolution (and in consultation with the student), shall recommend that the student either terminate her/his tenure in the Ph.D. program in Ecology & Evolution, or reschedule a second proposal hearing within three months. Written conditions for the awarding of a terminal M.S. in Ecology & Evolution shall be provided by the Chair of the Dissertation Proposal Committee to the Chair of the Department of Ecology & Evolution, with a copy to the student.
Forms for official recording of the results of the Dissertation Proposal Hearing and nomination for Ph.D. and/or M.S. candidacy are required and will be prepared by the Graduate Education Administrator. The forms should be returned, with the required signatures, to the Graduate Education Administrator following completion of the Examination. The Department will then submit the candidacy and examination forms to the BSD Office of Graduate Affairs.

**Progress towards the Ph.D. Degree**

When a student has passed the Dissertation Proposal Hearing with permission to proceed to candidacy for the Ph.D. degree, a Doctoral Committee will be formed by the Director of Graduate Education, in consultation with the student and his/her advisor. The rules for the composition of this Committee are the same as those for the Final Examination Committee (see below), and normally the two committees will have the same membership, although periodic changes in the composition of the Doctoral Committee are permitted.

The Doctoral Committee will meet with second and third-year students at least once a year, and will submit in writing to the Director of Graduate Education its assessment of the student's progress. This assessment is normally to be based on a written progress report from the student and an oral discussion between the student and the Doctoral Committee.

The Basic Science Chairs of the Division of the Biological Sciences have adopted the following policy for monitoring the progress of students in the BSD Ph.D. programs:

- Beginning in the fourth year, each PhD student should meet with his/her Dissertation Committee once every other quarter. Students in Ecology and Evolution should hold these committee meetings in the Autumn and Spring quarters. The Autumn quarter meeting must be scheduled so that advisor can submit a written report to the department Chair before the December faculty meeting.
- The student's Advisor is responsible for reporting a summary of the Doctoral Committee meeting’s proceedings to the Department of Ecology & Evolution.
- The student's registration for their fifth, and subsequent, years shall be permitted only if summaries of the Doctoral Committee meetings have been reported to the appropriate academic unit.

Based on these reports, and the discussion in the December faculty meeting, the Department Chair and Director of Graduate Education submit requests to the BSD Office of Graduate Affairs for the next year’s fellowships for continuing students. The budget for the next academic year (beginning July 1) is finalized shortly thereafter, and it includes the maximum number of students the Department can admit for the next academic year.

By December 1, each student should submit the following to the Director of Graduate Education: current CV, progress report, timetable for completion of the Ph.D., significant publications/abstracts of scientific talks. These materials should be available to the faculty well before the December faculty meeting.

The student is responsible for ensuring the fulfillment of all degree requirements of the University (as set out in the Announcements of the Graduate Programs in the Division of Biological Sciences) and of the Department, as indicated in this notice and its successors.
The Dissertation Defense for the Ph.D. Degree

1. The Division of Biological Sciences requires a student to have been in candidacy for the Ph.D. degree at least eight months before the degree can be awarded. As noted in the General Knowledge Exam, and Dissertation Proposal Hearing guidelines (detailed above):
   • Each student, upon successfully passing each examination, is responsible for ensuring that the relevant forms for admission to degree candidacy/to receive a degree have been properly submitted.
   • The Director of Graduate Education or the Graduate Education Administrator will provide the applicable degree forms to the student’s committee members, so the forms can be signed.
   • The Director of Graduate Education will then forward the forms to the Division of Biological Sciences for review and submission to the Registrar’s office.

2. Any student who fails to take the Final Examination within five years (20 quarters) of passing the Dissertation Proposal Hearing shall normally be required to re-defend the dissertation proposal.

3. The student will notify the Department Chair of his/her wish to schedule the Final Examination, after seeking the approval of the Doctoral Committee.

4. The Committee will consist of at least five members. The Chair of the Committee must have an appointment in the Department of Ecology & Evolution. Non-departmental Advisors may be permitted, after consultation with the Department Chair. At least two members of the Committee, in addition to the Chair, must be members of the Department of Ecology & Evolution, although in extraordinary circumstances this requirement may be altered by the Department Chair.

5. The student must submit one copy of her/his dissertation and a brief abstract to the Director of Graduate Education at least 21 days before the date of the Final Examination. The student also shall provide one copy of the dissertation for each member of the Committee. Arrangements for announcing the examination are the same as those described above for the dissertation proposal defense.

6. The Final Examination shall consist of a public seminar on the subject of the research described in the student's dissertation. A closed session will normally be held at the end of the public examination. At least four members of the Committee (including the Committee Chair) must be present at the examination, with the others submitting written questions or comments.

7. The Committee Chair shall communicate the result of the examination, in writing, on the "Report on the Final Examination" form to the Department Chair. The signed form should be submitted to the Director of Graduate Education as soon as possible after the examination.
Dissertation and Graduation

After successfully passing the Final Examination for the Ph.D., and receiving the written approval of the Department Chair, the student must submit the written dissertation to the Dissertation Office in Regenstein Library. The student will be allowed to graduate only after the Dissertation Office has accepted a final copy of the dissertation. For more information on the procedures for preparing and submitting the dissertation, please visit the website of the Dissertation Office at http://www.lib.uchicago.edu/e/phd/. Also, the student should meet with the Director of Graduate Education at least 4 weeks prior to the start of her/his final quarter to review what needs to be done in order to graduate (i.e., applying for graduation, the dissertation submission process, etc.).

It is the student’s responsibility to make sure that the dissertation is prepared in a form suitable for acceptance by the Dissertation Office. Students are advised to consult with this office well in advance of final preparation of their dissertation. The Dissertation Office must receive, approve, and accept the PDF copy of the student's dissertation before the quarterly deadline (usually 3.5 weeks before Convocation) for the student to graduate at the following convocation. Failure to meet the Dissertation Office’s deadline will result in a delay of graduation of at least one quarter. University regulations require that Ph.D. students be registered for research on campus in the quarter in which they graduate. This means that full tuition and fees for that quarter must be paid.

The Department will retain the copy of the student’s dissertation sent by the Dissertation Office for microfilming. This copy will be bound and kept for reference (and posterity) with other dissertations in Ecology & Evolution.

Please keep us informed about what you're doing and where you are, post-graduation. Your Ph.D. is a major accomplishment, and we would like to stay informed on what you are doing with it!
Ecology & Evolution Course Offerings

ECEV 30950. Evolutionary and Genomic Medicine. 100 Units.
Evolution is regularly investigated in free-living organisms, but some of its most fascinating and important examples occur in the interface between free-living and non-free-living states. In this course, we will use evolutionary and ecological principles to study the dynamics of viruses, unicellular organisms and cells in multi-cellular organisms relevant to human medicine. In EGM I, the emphasis will be on the evolution of pathogens, the evolution of cells of the immune system in response to pathogen invasion, the basis of autoimmune disorders, and the population genetics of cancerous cells in light of recent cancer genomic studies. EGM II will cover more general topics including Darwinian medicine, aging, and systems biology/medicine. This will be a lecture course with substantial reading, presentation, and discussion by students.
Instructor(s): S. Cobey
Prerequisite(s): Background in evolution and population genetics

ECEV 31100. Evolution of Biological Molecules. 100 Units.
The course connects evolutionary changes imprinted in genes and genomes with the structure, function and behavior of the encoded protein and RNA molecules. Central themes are the mechanisms and dynamics by which molecular structure and function evolve, how protein/ RNA architecture shapes evolutionary trajectories, and how patterns in present-day sequence can be interpreted to reveal the interplay data of evolutionary history and molecular properties. Core concepts in macromolecule biochemistry (folding and stability of proteins and RNA, structure-function relationships, kinetics, catalysis) and molecular evolution (selection, mutation, drift, epistasis, effective population size, phylogenetics) will be taught, and the interplay between them explored.
Instructor(s): A. Drummond, J. Thornton
Prerequisite(s): Comfort with basic computer programming (course will use Python and R); undergraduate biology, chemistry, calculus, and introductory statistics.

ECEV 32000. Introduction to Scientific Computing for Biologists. 100 Units.
The course will cover basic concepts in computing for an audience of biology graduate students. The students will receive basic training in the use of version control systems, databases and regular expressions. They will learn how to program in python and R and how to use R to produce publication-grade figures for their manuscripts, and how to typeset scientific manuscripts and theses using LaTeX. All the examples and exercises will be biologically motivated and will make use of real data. The approach will be hands-on, with lecturing followed by exercises in class.
Instructor(s): S. Allesina

ECEV 32900. Plant Development and Molecular Genetics. 100 Units.
Genetic approaches to central problems in plant development will be discussed. Emphasis will be placed on embryonic pattern formation, meristem structure and function, reproduction, and the role of hormones and environmental signals in development. Lectures will be drawn from the current literature; experimental approaches (genetic, cell biological, biochemical) used to discern developmental mechanisms will be emphasized. Graduate students will present a research proposal in oral and written form; undergraduate students will present and analyze data from the primary literature, and will be responsible for a final paper.
Instructor(s): J. Greenberg
Prerequisite(s): For undergraduates only: Completion of the general education requirement in the biological sciences
ECEV 34500. Advanced Topics in Evolution. 100 Units.
While evolution by natural selection is an elegantly simple phenomenon, modern research in evolutionary biology contains a variety of controversial, and sometimes confusing, topics. In this course, we will explore, as a group, a select list of controversial or confusing topics in evolutionary biology through a mix of student-led presentations and discussion of the primary literature. Each student will also write a review paper about his or her selected topic.
Instructor(s): M. Kronforst

ECEV 35600. Principles of Population Genetics-1. 100 Units.
Examines the basic theoretical principles of population genetics, and their application to the study of variation and evolution in natural populations. Topics include selection, mutation, random genetic drift, quantitative genetics, molecular evolution and variation, the evolution of selfish genetic systems, and human evolution.
Instructor(s): Steinruecken and Kreitman

ECEV 35800. Classics in Evolutionary Genetics. 100 Units.
Major classic papers in evolutionary genetics that had great impact on the development of the field are reviewed.
Instructor(s): M. Long

ECEV 35901. Genomic Evolution. 100 Units.
Canalization, a unifying biological principle first enunciated by Conrad Waddington in 1942, is an idea that has had tremendous intellectual influence on developmental biology, evolutionary biology, and mathematics. In this course we will explore canalization in all three contexts through extensive reading and discussion of both the classic and modern primary literature. We intend this exploration to raise new research problems which can be evaluated for further understanding. We encourage participants to present new ideas in this area for comment and discussion.
Instructor(s): M. Long and J. Reinitz

ECEV 36900. Topics in Paleobiology. 100 Units.
In this seminar we investigate paleobiological or multidisciplinary topics of current interest to students and faculty. Previous subjects include the origin of phyla, historical and macro-ecology, the stratigraphic record and evolutionary patterns, and climate and evolution.
Instructor(s): D. Jablonski

ECEV 36700. Advanced Topics in Behavioral Ecology. 100 Units.
A discussion and critical analysis of behavioral ecology. The course will consist of lectures, reading and discussion.
Instructor(s): S. Pruett-Jones

ECEV 38500. Color in Nature. 100 Units.
Explanations for the diversity of colors in nature are one of the most elusive and outstanding problems in evolutionary biology. In this course, we will combine advances in understanding of color perception and color production, including the basics of the physics of light, with evolutionary models of social and sexual selection. We will emphasize Endler’s sensory drive, which attempts to build a predictive model of what color an organism should display based on the environment it lives in, and its neurobiological make-up. Our examples will be largely drawn from vertebrates, but we will touch on invertebrates and plants. The course will consist of a mix of lectures (some from invited outside speakers) and discussion.
Instructor(s): T. Price
ECEV 40100. Grants, Publications and Professional Issues. 100 Units.
Covers professional topics in evolutionary biology, primarily strategies in grant writing and review. Each student will work towards the submission of an application of their choice. The course meets weekly and involves extensive writing and discussion.

Instructor(s): S. Allesina, R. Ho, M. Coates
Note(s): Only open to first year graduate students in the Darwinian Sciences Cluster

ECEV 40200. Advanced Topics in Ethics for the Darwinian Sciences. 100 Units.
This course covers advanced topics in ethics relevant to senior Ph.D. students in the Darwinian Sciences. CEB students are required to successfully complete this course before being awarded the Ph.D.

Instructor(s): TBD
Prerequisite(s): Open to Ph.D. students in the Darwinian Sciences

ECEV 42600. Community Ecology. 100 Units.
Lectures and readings cover advanced topics in multi-species systems, and include an introduction to basic theoretical approaches.

Instructor(s): J.T. Wootton

ECEV 42800. Population Ecology. 100 Units.
A lecture course on the empirical and theoretical approaches to the study of natural populations, including field methodologies and quantitative approaches. Includes computer assignments.

Instructor(s): C. Pfister

ECEV 42900. Theoretical Ecology. 100 Units.
An introduction to mathematical modeling in ecology. The course will begin with linear growth and Lotka-Volterra models, and proceed to partial differential equations. The course's perspective will emphasize numerical computations and fitting models to data.

Instructor(s): G. Dwyer, S. Cobey

ECEV 44001. Molecular Evolution I: Fundamentals and Principles. 100 Units.
The comparative analysis of DNA sequence variation has become an important tool in molecular biology, genetics, and evolutionary biology. This course covers major theories that form the foundation for understanding evolutionary forces that govern molecular variation, divergence, and genome organization. Particular attention is given to selectively neutral models of variation and evolution, and to alternative models of natural selection. The course provides practical information on accessing genome databases, searching for homologous sequences, aligning DNA and protein sequences, calculating sequence divergence, producing sequence phylogenies, and estimating evolutionary parameters.

Instructor(s): M. Kreitman
Prerequisite(s): Two quarters of biology and calculus, or consent of instructor
# UNIVERSITY ACADEMIC CALENDAR
## 2021-2022

### Summer 2021

<table>
<thead>
<tr>
<th>Date</th>
<th>Event/Deadline</th>
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<tbody>
<tr>
<td>Monday, June 21</td>
<td>Summer Quarter Begins</td>
</tr>
<tr>
<td>Sunday, July 4</td>
<td>Independence Day</td>
</tr>
<tr>
<td>Friday, July 30</td>
<td>Dissertation Deadline</td>
</tr>
<tr>
<td>Saturday, August 28</td>
<td>Summer Quarter Ends</td>
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### Autumn 2021

<table>
<thead>
<tr>
<th>Date</th>
<th>Event/Deadline</th>
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<tbody>
<tr>
<td>Monday-Friday, September 20-24</td>
<td>New Student Orientation Week</td>
</tr>
<tr>
<td>Monday, September 27</td>
<td>Autumn Quarter Begins</td>
</tr>
<tr>
<td>Friday, November 12</td>
<td>Dissertation Deadline</td>
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<tr>
<td>Monday-Friday, November 22-26</td>
<td>Thanksgiving Break</td>
</tr>
<tr>
<td>Saturday-Monday, December 4-6</td>
<td>College Reading Period</td>
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<td>Saturday, December 11</td>
<td>Autumn Quarter Ends</td>
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### Winter 2022

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<tr>
<th>Date</th>
<th>Event/Deadline</th>
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<tbody>
<tr>
<td>Monday, January 3</td>
<td>Winter Quarter Begins</td>
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<tr>
<td>Monday, January 17</td>
<td>Martin Luther King, Jr. Day</td>
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<tr>
<td>Friday, February 18</td>
<td>Dissertation Deadline</td>
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<tr>
<td>Saturday-Monday, March 5-7</td>
<td>College Reading Period</td>
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<tr>
<td>Saturday, March 12</td>
<td>Winter Quarter Ends</td>
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### Spring 2022

<table>
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<tr>
<th>Date</th>
<th>Event/Deadline</th>
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<tbody>
<tr>
<td>Monday, March 21</td>
<td>Spring Quarter Begins</td>
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<tr>
<td>Friday, May 6</td>
<td>Dissertation Deadline</td>
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<tr>
<td>Saturday-Monday, May 21-23</td>
<td>College Reading Period</td>
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<tr>
<td>Monday, May 30</td>
<td>Memorial Day</td>
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<tr>
<td>Saturday, June 4</td>
<td>Convocation</td>
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<tr>
<td>Saturday, June 4</td>
<td>Spring Quarter Ends</td>
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Biological Sciences Division policy requirements
for admission to candidacy to the Ph.D.
and for the Ph.D. degree

1. Admission to candidacy in the Ecology & Evolution program, for the degree of Ph.D. requires:
   a. Completion of Divisional Course requirements (five courses, one of which may be substituted by graded laboratory rotations). A “B” average (GPA = 3.0) must be maintained.
   b. Completion of four additional courses (for a total of nine graded courses) directly relevant to the student’s research program. A “B” average (GPA = 3.0) must be maintained.
   c. Submission of a written thesis proposal and its defense to the satisfaction of the candidate’s thesis committee (note in some programs this defense also has a public component).

2. Admission to candidacy must occur, or be scheduled to occur, before the end of the student’s ninth quarter in residency (typically the Fall quarter of the 3rd year).

3. If admission to candidacy has not occurred by the end of the student’s ninth quarter then he/she will be unable to register at the beginning of the tenth quarter unless OGPA has approved a detailed plan from the program, student, and thesis advisor in which:
   a. The program adequately explains why candidacy has not yet been achieved.
   b. The student lays out a detailed plan for completion of the thesis proposal, with a timeline that does not extend beyond the end of their eleventh quarter in residency.
   c. The thesis advisor provides a detailed plan, which includes frequency and nature of mentoring meetings, to assist the student in satisfactorily completing and defending the thesis proposal.

4. Completion of the Ph.D. degree additionally requires:
   a. Completion of Divisional TA-ship requirements
   b. Completion of Divisional Ethics training requirements
   c. Completion of all graduate program-specific requirements.
   d. Submission and oral defense, to the satisfaction of the student’s thesis committee and graduate program, of an original dissertation.

Approved Program Chairs.2.12.13