Welcome

to the

University of Michigan
Department of Ecology and Evolutionary Biology

Graduate Student Handbook
September 2011
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## Entering Graduate Students
### Fall Term 2011

- **Ph.D. Program** -

<table>
<thead>
<tr>
<th>Name</th>
<th>Education</th>
<th>Area of Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bemmels, Jordan</td>
<td>B.S., University British Columbia</td>
<td>Plant evolutionary biology, forest history</td>
</tr>
<tr>
<td>Busso, Juan Pablo</td>
<td>Universidad Nacional de Córdoba, Argentina</td>
<td>Sexual selection, communicative signaling</td>
</tr>
<tr>
<td>Crocker, Katherine</td>
<td>B.A., Cornell University</td>
<td>Behavior, sustainable agriculture</td>
</tr>
<tr>
<td>D’Andrea Rocha, Rafael</td>
<td>M.A., SUNY at Stony Brook M.S. University of Michigan</td>
<td>Theoretical community ecology, biodiversity, community structure, tropical forests</td>
</tr>
<tr>
<td>Farinas, Serge</td>
<td>B.S., Clayton State University M.S., University of Michigan</td>
<td>Plant ecology: anthropogenic impacts on plant community composition, diversity and distribution</td>
</tr>
<tr>
<td>Glaum, Paul</td>
<td>B.A., Univ. Wisconsin</td>
<td>Mathematical modeling &amp; agro-ecology, theoretical ecology</td>
</tr>
<tr>
<td>Ho, Wei-Chin</td>
<td>M.S., National Taiwan University</td>
<td>Genetics, genomics, evolution, variations in genome-wide &amp; systems views</td>
</tr>
<tr>
<td>Jenkinson, Thomas</td>
<td>M.S., San Francisco State Univ.</td>
<td>Mycology, infectious disease</td>
</tr>
<tr>
<td>Li, Chuan</td>
<td>B.S., Sun Yat-Sen University</td>
<td>Evolutionary genetics, genetic diversity</td>
</tr>
<tr>
<td>McKnight, Tristan</td>
<td>B.S., Brigham Young Uni.</td>
<td>Evolutionary forces that shape community ecology in arthropods, insect ecology and evolutionary biology, speciation</td>
</tr>
<tr>
<td>Munoz, Carlos</td>
<td>M.S., University of Concepción, Chile</td>
<td>Systematics, phylogeography, biogeography, evolution, genetic diversity.</td>
</tr>
<tr>
<td>Ong, Theresa</td>
<td>B.S. &amp; B.A Santa Monica College M.S. Univ. Michigan</td>
<td>Agroecology, theoretical ecology</td>
</tr>
<tr>
<td>Name</td>
<td>Education</td>
<td>Area of Interest</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------------------------------------</td>
<td>--------------------------------------------------------------------</td>
</tr>
<tr>
<td>Taylor, Alexander</td>
<td>B.S., University of Michigan</td>
<td>Phylogenetics &amp; macroevolutionary theories, plants, bryophytes</td>
</tr>
<tr>
<td>Teichholtz, Paula</td>
<td>B.S., Univ New Hampshire</td>
<td>Marine invertebrates, epibiosis and parasitism, evolution of life history and feeding traits</td>
</tr>
<tr>
<td>Thomaz, Andrea</td>
<td>M.S., Universidade Federal do Rio Grande do Sul, Brazil</td>
<td>Population genetics, speciation, phylogenetics, evolutionary biology</td>
</tr>
<tr>
<td>Valencia Mestre, Mariana</td>
<td>M.S., Univ Illinoi- Chicago</td>
<td>Community ecology, biostatistics, conservation biology, agro-ecology</td>
</tr>
<tr>
<td>Yitbarek, Senay</td>
<td>B.A., University of California, Berkeley M.S. University of Michigan</td>
<td>Agricultural ecology, insect meta-population dynamics</td>
</tr>
</tbody>
</table>

- Frontiers Master's Program –

<table>
<thead>
<tr>
<th>Name</th>
<th>Education</th>
<th>Area of Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baiz, Marcella</td>
<td>B.S. Grand Valley St Univ.</td>
<td>Plant evolution, biology and forest history</td>
</tr>
<tr>
<td>Moore, Alexandria</td>
<td>B.S. University of Michigan</td>
<td>Conservation ecology, biodiversity</td>
</tr>
<tr>
<td>Otero, Beatriz</td>
<td>B.S., Univ. Puerto Rico - Rio Piedras</td>
<td>Ecosystem ecology, biodiversity, agriculture</td>
</tr>
<tr>
<td>Smith, Lillian</td>
<td>B.S., Oakwood Univ.</td>
<td>Plant ecology, tropical ecology, biodiversity</td>
</tr>
</tbody>
</table>
## - Traditional M.S. Program -

<table>
<thead>
<tr>
<th>Name</th>
<th>Education</th>
<th>Area of Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arias, Anna</td>
<td>Ph.D. University of MI School of Education</td>
<td>Science education</td>
</tr>
<tr>
<td>Flowers, Samantha</td>
<td>B.S., Eastern Illinois Univ.</td>
<td>Evolutionary genetics, phylogenetic systems</td>
</tr>
<tr>
<td>Injaian, Allison</td>
<td>Ursinus College</td>
<td>Sexual selection, animal behavior</td>
</tr>
<tr>
<td>Karll, Kandice</td>
<td>B.A., Adrian College</td>
<td>Conservation biology, genetics</td>
</tr>
</tbody>
</table>

## - Continuing Graduate Students -

### Fall 2011

<table>
<thead>
<tr>
<th>Name</th>
<th>Program</th>
<th>Education</th>
<th>Area of Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allen, David</td>
<td>Ph.D.</td>
<td>B.A., Vassar M.S., University of Michigan</td>
<td>Complex systems and spatial dynamics</td>
</tr>
<tr>
<td>Alvarado-Serrano, Diego</td>
<td>Ph.D.</td>
<td>B.A., Pontifica University Catolica del Ecuador Quito</td>
<td>Ecology &amp; biogeography of mammals</td>
</tr>
<tr>
<td>Baeza, Andres</td>
<td>Ph.D.</td>
<td>B.S.E., Renewable Natural Resources</td>
<td>Computational ecology &amp; complex systems</td>
</tr>
<tr>
<td>Barabas, Gyorgy</td>
<td>Ph.D.</td>
<td>M.S. Physics, Eotvos Lorand University</td>
<td>Theoretical biology</td>
</tr>
<tr>
<td>Baskerville, Edward</td>
<td>Ph.D.</td>
<td>B.S. Computer Science, University of Michigan</td>
<td>Modeling &amp; theory</td>
</tr>
<tr>
<td>Bick, Cindy</td>
<td>Frontiers, M.S.</td>
<td>B.S. San Jose State University</td>
<td>Tropical ecology, conservation biology</td>
</tr>
<tr>
<td>Name</td>
<td>Degree</td>
<td>Institution</td>
<td>Field of Study</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------</td>
<td>--------------------------------------------------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>Briggs, Keeley</td>
<td>Traditional M.S.</td>
<td>B.S., Tulane University</td>
<td>Museum studies, science education</td>
</tr>
<tr>
<td>Cable, Rachel</td>
<td>Traditional M.S.</td>
<td>B.S., University of Texas</td>
<td>bio-geography, conservation &amp; behavioral ecology</td>
</tr>
<tr>
<td>Chang, Dan</td>
<td>Ph.D.</td>
<td>B.Sc., Ocean University of China</td>
<td>Molecular ecology &amp; genetics</td>
</tr>
<tr>
<td>Cheng, Susan</td>
<td>Ph.D.</td>
<td>B. A., Columbia University</td>
<td>Forest ecosystems, climate change, plant-atmosphere interactions</td>
</tr>
<tr>
<td>Churchill, Celia</td>
<td>Ph.D.</td>
<td>B.S., University of California - Los Angeles</td>
<td>Marine invertebrate evolution &amp; systematic</td>
</tr>
<tr>
<td>Crumsey, Jasmine</td>
<td>Ph.D.</td>
<td>B.S. Biology / Science Education, Albany St. University</td>
<td>Terrestrial ecosystems, biogeochemistry</td>
</tr>
<tr>
<td>Dobkowsk, Jason</td>
<td>Traditional M.S.</td>
<td>B.S., University of Michigan</td>
<td>Aquatic ecosystems, arctic, biogeo chemistry</td>
</tr>
<tr>
<td>Dorsey, Brian</td>
<td>Ph.D.</td>
<td>B.S., Humboldt State University</td>
<td>Plant evolution</td>
</tr>
<tr>
<td>Gan, Huijie</td>
<td>Ph.D.</td>
<td>B.S. Ecology, Peking University</td>
<td>Nutrient cycling in ecosystem ecology</td>
</tr>
<tr>
<td>Gould, Alison</td>
<td>Ph.D.</td>
<td>M.S., San Francisco State University</td>
<td>Population dynamics, marine populations, invertebrates</td>
</tr>
<tr>
<td>Guittar, John</td>
<td>Ph.D.</td>
<td>B.A., Grinnell College</td>
<td>Plant community ecology, tropics</td>
</tr>
<tr>
<td>Haghighat, Sahar</td>
<td>Frontiers M.S.</td>
<td>B.A., Monmouth College</td>
<td>Plant ecology, conservation &amp; ecosystem management</td>
</tr>
<tr>
<td>Han, Hyunmin</td>
<td>Ph.D.</td>
<td>B.S., University of Michigan</td>
<td>Metadynamics, population &amp; ecosystem ecology</td>
</tr>
<tr>
<td>He, Qixin</td>
<td>Ph.D.</td>
<td>B.S. Biology, Fudan University</td>
<td>Adaptive evolution; genomic evolution; speciation</td>
</tr>
<tr>
<td>Name</td>
<td>Degree</td>
<td>University</td>
<td>Research Focus</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------</td>
<td>-----------------------------------------------</td>
<td>---------------------------------------------------</td>
</tr>
<tr>
<td>Hendry, Tory</td>
<td>Ph.D.</td>
<td>B.A., Williams College</td>
<td>Microbiology</td>
</tr>
<tr>
<td>Huang, Huateng</td>
<td>Ph.D.</td>
<td>B.S., University of Science and Technology of China</td>
<td>Adaptive evolution and speciation</td>
</tr>
<tr>
<td>Huang, Jen-Pan</td>
<td>Ph.D.</td>
<td>M.S., Tunghai University</td>
<td>Molecular evolution, phylogeny, speciation, population genetics</td>
</tr>
<tr>
<td>Iverson, Aaron</td>
<td>Ph.D.</td>
<td>B.S., Calvin College</td>
<td>Tropical Ecology</td>
</tr>
<tr>
<td>Jackson, Doug</td>
<td>Ph.D.</td>
<td>B.S. Mechanical Eng., Colorado State University M.S. EEB, Univ. of Michigan</td>
<td>Computational ecology</td>
</tr>
<tr>
<td>Li, Jingchun</td>
<td>Ph.D.</td>
<td>B.S. Biology, Capital Normal University</td>
<td>Morphology, speciation</td>
</tr>
<tr>
<td>McGinnis, Leslie</td>
<td>Traditional M.S.</td>
<td>B.S. University of Washington</td>
<td>Conservation biology</td>
</tr>
<tr>
<td>Marino, John</td>
<td>Ph.D.</td>
<td>B.A. Zoology and History, University of Wisconsin</td>
<td>Aquatic community ecology</td>
</tr>
<tr>
<td>Martinez-Bakker, Micaela</td>
<td>Ph.D.</td>
<td>B.S., University of Alaska</td>
<td>Infectious disease, population ecology, phylo-genetics</td>
</tr>
<tr>
<td>Marvin, David</td>
<td>Ph.D.</td>
<td>B.A. Psychology, Johns Hopkins University</td>
<td>Tropical forest diversity</td>
</tr>
<tr>
<td>Massatti, Robert</td>
<td>Ph.D.</td>
<td>M.S., University of Wyoming</td>
<td>Plant systematics, taxonomy, population biology</td>
</tr>
<tr>
<td>Metzger, Brian</td>
<td>Ph.D.</td>
<td>B.S. University of Wisconsin, Madison</td>
<td>Complex systems, genetics &amp; mathematics</td>
</tr>
<tr>
<td>Qian, Wenfeng</td>
<td>Ph.D.</td>
<td>B.S., Beijing University</td>
<td>Evolutionary genetics</td>
</tr>
<tr>
<td>Reed, Jay</td>
<td>Ph.D.</td>
<td>B.Sc., Washburn University</td>
<td>Herpetology &amp; parasite-host interactions</td>
</tr>
<tr>
<td>Sedio, Brian</td>
<td>Ph.D.</td>
<td>B.S., Biochemistry,</td>
<td>Forest tree community assembly &amp;</td>
</tr>
<tr>
<td>Name</td>
<td>Degree</td>
<td>Institution</td>
<td>Research Area</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------</td>
<td>--------------------------------------</td>
<td>---------------------------------------------------</td>
</tr>
<tr>
<td>Semrau, Kassandra</td>
<td>Traditional M.S.</td>
<td>B.S., University of Michigan</td>
<td>Environmental science, plant biology, ecosystems</td>
</tr>
<tr>
<td>Sheehan, Michael</td>
<td>Ph.D.</td>
<td>B.A., University of Pennsylvania</td>
<td>Behavioral ecology</td>
</tr>
<tr>
<td>Sylvain, Iman</td>
<td>Frontiers M.S.</td>
<td>B.S., Howard University</td>
<td>Plant ecology, bio-diversity, ethnobotany</td>
</tr>
<tr>
<td>Tao, Leiling</td>
<td>Ph.D.</td>
<td>B.S. Ecology, Sun Yat-sen University</td>
<td>Ecosystem ecology</td>
</tr>
<tr>
<td>Tran, Lucy</td>
<td>Ph.D.</td>
<td>B.S. Ecology, University of California</td>
<td>Spatial patterns &amp; processes of speciation</td>
</tr>
<tr>
<td>Unruh, Alexa</td>
<td>Traditional M.S.</td>
<td>B.S. and B.A. University of Minnesota-Twin Cities</td>
<td>Mammalian ecology, ecosystems</td>
</tr>
<tr>
<td>Wan, Judy</td>
<td>Ph.D.</td>
<td>B.S. Biology, University of Michigan</td>
<td>Community ecology &amp; mammalian behavior</td>
</tr>
<tr>
<td>Wang, Zengguang</td>
<td>Ph.D.</td>
<td>M.S., Peking University</td>
<td>Experimental evolution, genomics, systematics</td>
</tr>
<tr>
<td>Wason, Elizabeth</td>
<td>Ph.D.</td>
<td>B.S. Biology, University of Houston</td>
<td>Global ecosystems</td>
</tr>
<tr>
<td>Webb, William</td>
<td>Frontiers M.S.</td>
<td>B.S., Howard University</td>
<td>Vertebrate ecology, herpetology, animal behavior</td>
</tr>
<tr>
<td>Wei, Na</td>
<td>Ph.D.</td>
<td>B.S., Nanjing University</td>
<td>Plant systematics, population genetics</td>
</tr>
<tr>
<td>Wright, Jeremy</td>
<td>Ph.D.</td>
<td>B.A. and B.S., University of Rhode Island M.Sc., University of Florida – Gainesville</td>
<td>Fish Systematics</td>
</tr>
<tr>
<td>Yang, Ya</td>
<td>Ph.D.</td>
<td>B.Sc., Peking University</td>
<td>Plant systematics</td>
</tr>
</tbody>
</table>
Important Contacts and Phone Numbers

Many organizations are available to aid students as they proceed through their respective programs. Students are urged to become acquainted with these opportunities and should not hesitate to take advantage of them, or contact the Graduate Office staff with any questions.

Jane Sullivan, Graduate Program Coordinator, 2019 Kraus ....................... 615-7338

Do you have questions about degree requirements or funding?
Stop in to see Jane if you need assistance!

Anna Cihak, Biology Program Coordinator, 1111 Nat. Sci. ......................... 764-2446

If you have questions about a Graduate Student Instructor (GSI) appointment, please stop by and talk to Anna, Tony DeRuiter or Jill Beeson in the Undergraduate Biology Office.

Benefits Office, Wolverine Tower................................................................. 615-2000
Low Rise G405, 3003 South State Street

CAPS - Counseling and Psychological Services, 3100 Michigan Union .... 764-8312
Walk-in counseling, appointments, and information. Evenings, weekend, or emergency.
Peer counseling and referral...................................................................... 764-8433

Comprehensive Studies Program, G155 Angell .................................... 764-9128
Special assistance to students who have financial, personal, social or academic concerns.

Financial Aid, 2011 Student Activities Bldg.............................................. 763-4119

Fellowships Office, Rackham, 915 E. Washington ................................. 764-8119

Graduate Employees Organization .............................................................. 995-0221

University Health Service, 207 Fletcher Street ........................................... 764-8320
Emergency Clinic, open 24 hours daily ................................................. 763-4511
Gynecology and Contraception Clinic ...................................................... 763-9184
Allergy Immunization and Travel Health Clinic ....................................... 764-8304
Problem Pregnancy Counseling ............................................................. 763-4511
STD Information (may request male or female physician) ..................... 763-4511
Nursing Center ......................................................................................... 763-4511

Urgent/Outpatient care available to students (including those enrolled within the last 12 months) and spouses. Appointment recommended, but walk-in patients are treated when urgent. Absolute confidentiality of records is maintained. Minimal fee in
some clinics.

**International Center**, 603 E. Madison .......................................................... 764-9310
  Visa and work permission information for international students. Study abroad travel abroad information for all students.

**Student Legal Services**, 2304 Michigan Union .............................................. 763-9920

**The Spectrum Center**, 3200 Michigan Union .............................................. 763-4186
  Educational outreach programs for lesbian, gay, bisexual and transgender students. Offers peer facilitated support groups, programs and events, resource library available.

**Libraries**
  Hatcher Graduate Library ............................................................. 764-0400
  Shapiro Science Library ............................................................. 764-3442
  Public Health Library ................................................................. 936-1391
  Taubman Medical Library ........................................................... 764-5169

M-Card Lost, 100 Student Activities Building .............................................. 763-4632

**Multi-Ethnic Student Affairs**, 2202 Michigan Union .................................. 763-9044

Notary Public (Cindy Carl), 2019 Nat Sci ..................................................... 615-7338

**Off Campus Housing**, 1011 Student Activities Bldg.................................... 764-7455

**Office of the Ombuds**, 6015 Fleming Administration Building .................. 763-3545

**Payroll Office**, 3003 South State Street ..................................................... 615-2000

**Residence Status**, 430 E. Huron ............................................................... 764-1400

**Services for Students with Disabilities**, G-664 Haven Hall ....................... 763-3000

**Students of Color of Rackham** ................................................................. 528-0075

**Student Mediation Services**, 4354 Michigan Union .................................. 647-7397

**Student Activities and Leadership**, 2205 Michigan Union ....................... 763-5900
  Work with students and student organizations on leadership and development and student organization involvement.
## Calendar of Events – Academic Year 2011 - 2012

### Fall Term 2011

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, September 1(^{st})</td>
<td>EEB Department Orientation&lt;br&gt;2009 Ruthven Museums, 8:45am – 4:30pm</td>
</tr>
<tr>
<td>Friday, September 2(^{nd})</td>
<td>Rackham New Graduate Student Fall Welcome&lt;br&gt;Rackham Graduate School, 9:30 a.m. – 12:30 p.m.</td>
</tr>
<tr>
<td>Monday, September 5(^{th})</td>
<td>Labor Day Holiday - No Classes. Last day to register for classes</td>
</tr>
<tr>
<td>Tuesday, September 6(^{th})</td>
<td>Classes begin. Late registration fees apply if not yet enrolled. Last day to dis-enroll without fee changes.</td>
</tr>
<tr>
<td>Saturday, September 10</td>
<td>EEB Department Retreat – Inverness Country Club, Chelsea, MI</td>
</tr>
<tr>
<td>Monday, September 26(^{th})</td>
<td>Last day to access online class registration, including drop/add for courses without a “W” grade noted on transcript.</td>
</tr>
<tr>
<td>October 17(^{th}) - 18(^{th})</td>
<td>Fall Study Break – No Classes</td>
</tr>
<tr>
<td>Wednesday, November 23(^{rd})</td>
<td>Thanksgiving Recess Begins at 5:00 pm</td>
</tr>
<tr>
<td>Monday, November 28(^{th})</td>
<td>Thanksgiving Recess Ends at 8:00 am</td>
</tr>
<tr>
<td>Tuesday, December 13(^{th})</td>
<td>Fall Term Classes End</td>
</tr>
<tr>
<td>December 14(^{th}), 17(^{th}), 18(^{th})</td>
<td>Exam Study Days</td>
</tr>
<tr>
<td>December 15(^{th}) – 16(^{th}) &amp; 19(^{th}) – 22(^{nd})</td>
<td>Exam Days</td>
</tr>
<tr>
<td>72 Hours After Exam</td>
<td>All Grades Due in Wolverine Access</td>
</tr>
<tr>
<td>Sunday, December 18(^{th})</td>
<td>Winter Commencement Ceremony</td>
</tr>
</tbody>
</table>

### Winter Term 2012

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday, January 3(^{rd})</td>
<td>Last day to register for classes without incurring late fees.</td>
</tr>
<tr>
<td>Wednesday, January 4(^{th})</td>
<td>Classes begin. Late registration fees charged if not yet enrolled. Last day to disenroll without fee changes.</td>
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<tr>
<td>Monday, January 16(^{th})</td>
<td>No Classes. Dr. Martin Luther King Jr. Day Symposia</td>
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<tr>
<td>Saturday, February 25(^{th})</td>
<td>Spring Break Begins</td>
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<td>Monday, March 5(^{th})</td>
<td>Classes after Spring Break Vacation</td>
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<td>Date</td>
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<tr>
<td>Tuesday, April 17th</td>
<td>Last Day of Classes for Winter Term</td>
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<td>April 18th, 21st and 22nd</td>
<td>Study Days</td>
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<td>April 19th &amp; 20th, 23rd – 26th</td>
<td>Exam Days</td>
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<td>72 Hours After Exam</td>
<td>Grades Due</td>
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<td>April 27th – April 29th</td>
<td>Spring Commencement Activities</td>
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Please see the [Registrar’s Office website](#) for further information.
To register you will need:
1. Access to the web.
2. Your UM uniqname and password.
3. Course selections, including class and section numbers. (Refer to online time schedule for a list of offered classes.)
4. Electronic permission (required for independent study classes such as EEB 700, 730, 990 and 995, and other courses where the permission of the instructor is required.) Contact the graduate coordinator (janesull@umich.edu) to arrange for permission.
5. Log on to “Student Business” in Wolverine Access to register.

Students with GSI and GSRA Appointments - Graduate Student Instructors (GSI), Research Assistants (GSRA), Trainees and Fellows must register for a minimum of 6 credit hours. (Also, see pg. 15 for more information for GSI and GSRA appointment holders.)

Students with F-1 visas must be registered full-time. Full-time is defined as 9 credit hours for those who have not previously earned a relevant Master's degree, and 6 credit hours for those with GSI or GSRA positions (whether or not they've already earned a relevant M.S. degree). This rule is mandated by immigration regulations and monitored by Rackham's International Admissions Office.

Students Deferring Loans - Students who are deferring loans must register for a minimum of 9 credit hours.

Tuition bill
Tuition waivers are credited directly toward student accounts approximately three weeks into the term. The registration fees, (approximately $97) are not covered, so it is your responsibility to pay the fees by the due date on your bill (to avoid being assessed late fees).

Late registration fee
If you are not registered before the first day of class, a $50 late registration fee will be assessed to your account. Exceptions to the late fee are: late admissions, non-degree students, Ph.D. students registering to defend their dissertation. The late registration fee is increased by $25 at the beginning of each subsequent month.

Independent study courses
To register for independent study courses (e.g. EEB 700/EEB 730) electronic permission is required. To have a permission entered, please contact the graduate coordinator with the following information: course name, number and the name of the independent study instructor (i.e. the faculty member who will be entering your grade.) Once the permission has been entered, you will receive automatic notification that you may register for the course. Then go to “Student Business” within Wolverine Access and register. Follow the same procedure to acquire permission for any independent study class including EEB 801 (Supervised Teaching) and EEB 800 seminars.

Grades: Satisfactory/Unsatisfactory grades
Graduate students may elect Satisfactory/Unsatisfactory (S/U) grading in an otherwise graded course. "Satisfactory" means earning a minimum grade of "B" in the course. Students wishing to take a course S/U (if designated as a graded course) should make arrangements with the
instructor during the first three weeks of the term (first two weeks of a half term). Instructors may not assign letter grades (A-E) to students electing designated S/U courses. Graduate students may NOT register for or receive Pass/Fail grading (P/F grading is permitted for undergraduates only since students must earn a "C" or better in a course).

**Incompletes**
A student may receive a grade of Incomplete ("I") only if the coursework remaining to be done by the end of the semester is small and the instructor approves an extension for completing the unfinished work. The instructor must agree to this arrangement and determine a deadline for finishing the assigned work before a grade is assigned. The notation of “I” remains a permanent part of the academic record. When coursework is completed to the satisfaction of the instructor, the grade will appear on the transcript as, for example, “I B+.” The grade point average is based only on hours of coursework completed.
Information for University GSIs and GSRAs

GSIs (Graduate Student Instructors)
Priorities for assigning GSI-ships are typically: (1) EEB Ph.D. students (guaranteed GSI positions); (2) EEB Frontiers Master's students (guaranteed GSI positions); (3) EEB Traditional Masters students (not guaranteed); and then, (4) outside departments such as SNRE (School of Natural Resources and the Environment). Before each semester, faculty members provide their GSI preferences to Anna Cihak (cihak@umich.edu) depending on course needs in the department.

GEO contract
The Graduate Employees’ Organization (GEO) is the legal bargaining unit that represents graduate instructors and assistants at the University of Michigan. For information about the teaching contract, see the GEO website, or contact Anna Cihak (cihak@umich.edu) for detailed information regarding teaching regulations.

Payday
Graduate Student Instructors (GSIs) and Research Assistants (GSRAs) are paid once a month on the last working day of the month. Paychecks for GSIs and GSRAs may be issued by direct deposit or picked up at the UM Cashier's Office (2nd Floor of the Student Activities Building). You can set up your direct deposit online through Wolverine Access.

Registration requirements
GSIs, GSRAs, and fellowship holders must register for a minimum of 6 credit hours. Please note that ANY graduate student requesting loan deferment must be registered for a minimum of 9 credits.

EEB 801: Supervised Teaching
Graduate Student Instructors (GSIs) teaching in EEB for the first time, are required to take this class. EEB 801 is not a formal course, but a mechanism for obtaining one or two credit hours for teaching. Electronic permission to register for this class is required and first time GSI’s will be contacted directly via email by Anna Cihak in the Undergraduate Biology Office when they need to register for this class. The class may be repeated for credit. EEB 801 credit does not apply toward credit requirements of either of the Master's programs.

Health insurance
Students with GSI/GSRA appointments must enroll in a health insurance plan of their choosing. Plans include GradCare and several other options. Once their appointment is uploaded and confirmed within the University system, GISs/GSRAs receive an e-mail from the Benefits Office with instructions for selecting and enrolling in benefits. The Benefits Office is located at Wolverine Tower - Low Rise G405, 3003 S. State St. (Fax: (734) 763-0363). Any questions should be directed to the Benefits Office at 763-1214.
Ph.D. Program, Requirements, and Funding

Introduction:

Ecologists and evolutionary biologists seek to understand the origin and complex interactions of the earth's biodiversity and ecosystems. Faculty and graduate students within the EEB Department include ecologists, evolutionary biologists, organismal biologists and systematists who analyze such topics as behavior, biogeochemistry, population dynamics, community structure, environmental physiology, disease ecology, biogeography, life history evolution, selection, speciation, species interactions, and phylogenetics. Their techniques include comparative and experimental approaches in ecology, ethology, genetics, molecular biology, morphology, paleontology, physiology, biochemistry and cytology. Many members of this group are specialists on particular groups of organisms.

The field of ecology and evolutionary biology is currently undergoing a dynamic phase of intellectual growth, with the emergence of multiple new fields and novel opportunities for interdisciplinary collaboration. The University of Michigan’s Ph.D. Program is designed to capitalize upon this vibrant intellectual environment, providing a rigorous, integrative academic experience that encourages the development and exploration of individual research goals. Completion of a dissertation research project under the guidance of a major advisor is the primary goal of your EEB doctoral studies. Several milestones mark progress through the anticipated five year program.

During the first year students will take several courses and seminars while exploring faculty research interests. During the second year, in consultation with a research advisor, students identify a research problem, and lay the groundwork for a dissertation project. At the end of winter term of the second year, students undertake the Qualifying Examination, which consists of a faculty evaluation of a written review article, a research seminar presentation, and an oral examination. After passing all portions of the qualifying examination, students select their dissertation committee members, write a dissertation proposal, and meet with their committee for a “candidacy exam.” If their proposal is accepted, students will be recommended for advancement to candidacy.

Ph.D. candidates will complete their dissertation research under the guidance of an advisor and committee. In the final year, as research and writing are completed, candidates apply to defend their dissertation. Successful passage of the defense, and submission and acceptance of the dissertation by the Rackham Graduate School are the final steps in completion of the EEB doctoral program.

The general progress of individual students in graduate work is monitored annually by the graduate chair and the Graduate Affairs Committee (GAC). A student must complete all doctoral work within seven consecutive years from the date of first enrollment in the Rackham degree program. It should be noted however that funding is only guaranteed by the department for five full years. Additional information regarding each of the Ph.D. program milestones is provided in the following pages.

Oversight of graduate student affairs, including those related to funding, program status and student progress are the responsibility of the GAC. It is the responsibility of the student to petition the GAC for any program or funding status changes. Review can be initiated by sending an email to the graduate coordinator (janesull@umich.edu), who will forward the petition to the
GAC. All changes related to student affairs are reviewed by the GAC, usually in association with the recommendations of other EEB committees, the student’s advisor, faculty members and the department chair. After a GAC decision is reached, the student is notified of the decision, usually via e-mail, unless review/vote by EEB faculty is warranted.

The graduate chair is responsible for monitoring and evaluating the progress of students in the program. The graduate coordinator is available to provide information and assistance to graduate students and is responsible for coordination, administration and tracking of all matters pertaining to the graduate program. Students should feel free to consult the chair and/or the graduate coordinator with any questions or concerns. The current graduate chair is Dr. Lacey Knowles (knowlesl@umich.edu), who also chairs the GAC.

The EEB Ph.D. program requires two terms of teaching as part of the curriculum. Through teaching, students gain experience organizing and presenting scientific material to diverse student audiences. This teaching experience is critical for anyone who chooses a scientific career and especially for those who remain in academic positions at colleges or universities.

The EEB graduate program focuses on developing students as independent scientific researchers, and the program can be flexible. Students are initially matched by mutual consent with an advisor based on shared research interests. However, students can change advisors if their interests shift significantly as they proceed through the program. It is a student’s responsibility to identify and coordinate with a new advisor if they choose to switch. However, students interested in changing advisors should meet with the graduate chair to discuss this matter prior to making any formal arrangements.

**Ph.D. Program Requirements:**

**Initial Advising:**
New students attend a one-day EEB orientation in late August/early September prior to the start of classes. During orientation, students meet with a counseling committee, which is comprised of the graduate chair and their initial faculty advisor. At this meeting, the counseling committee (1) advises the student on course selection, (2) reviews departmental requirements, (3) selects EEB 700-730 advisors, and (4) discusses with the student various approaches for achieving their goals within the framework of EEB’s Ph.D. requirements. An initial report of this meeting is prepared by the counseling committee and submitted to the graduate coordinator for inclusion in the student's file.

In consultation with their initial advisor, students should also decide on a secondary advisor. Students are required to meet with both advisors (the "guidance committee") at least once during the fall term and regularly during the year to discuss their progress and to keep abreast of any changes in plans. It is essential that students seek advice from their advisor during all phases of the graduate program.

**Course Requirements:**
Rackham School of Graduate Studies course requirements for Ph.D. students are provided on the Rackham website. Pre-candidate students must complete 18 hours of graded graduate coursework in-residence prior to advancing to candidacy. No undergraduate course (course number 300 level or below) may be used to meet any Graduate School requirement.

**EEB 700 and 730:** All incoming Ph.D. students are required to register for EEB 700 (fall) and EEB 730 (winter) during the first academic year of enrollment. The number of credits
chosen for these classes is flexible, usually 1-3. Typically, EEB 700 is undertaken with a student's primary advisor, and EEB 730 is taken with either their primary or secondary advisor. Students are required to write one paper for either EEB 700 or 730, to submit this paper to their faculty advisor, and to submit a copy to the graduate program coordinator for placement in their file.

The course can be used either as a directed research or reading course and the options detailed below are provided as a guide in defining a specific course of study. At their first meeting, the student and advisor should decide on the specific format to be followed, possible topics, reading lists, etc., and should set up a general schedule for the term. Students can use this opportunity to explore ideas and research that will be valuable in helping them complete their dissertation research and requirements. The student should arrange regular meetings with one or both advisors during each term.

EEB 700-730 as a Research Course: Laboratory or field research in which the specific research project is initiated by the student or suggested by the faculty advisor. Research can be undertaken in several different laboratories as a lab rotation. The research can form the basis of future Ph.D. research, or be used to gain experience and knowledge in several areas or approaches that would be valuable in choosing a topic for dissertation research. The required paper could be written as a research report, or as a proposal for future research generated from preliminary results.

Use of EEB 700-730 as a Reading Course: A directed reading course in which the topic is selected as a result of consultation between the student and the faculty advisor. The reading list and required paper could be used as the basis for the second year evaluation paper, a basis for the Ph.D. dissertation, as a research proposal for the first summer's research, or as a way to make-up deficiencies in areas of ecology and evolutionary biology that seem necessary or useful for future research.

The paper required for EEB 700-730 should help prepare the student for summer research and/or the preparation of their evaluation examination paper. It should be substantial (~10+ pages), include literature citations, and be written in a scientific format (see the CBE Editor Style Manual or a major journal such as Ecology or Evolution—NOT Science or Nature). The subject matter and focus are up to the advisor, who must guide the student as to what will be most valuable in promoting their progress within the graduate program. For example, the student could write up background and experimental design for research over the summer that could lead to further thesis research; they could write a potential grant proposal, or they could undertake a review of literature that would provide background for dissertation research. The advisor can also add additional requirements such as a minimum or maximum paper length, number of publications cited, specific format, etc.

Other specific course requirements of the EEB Ph.D. program include the following:

**EEB 800: Biology Seminars – Various Topics** - These one-credit graduate seminar courses provide an opportunity to discuss current work and new developments in Ecology and Evolutionary Biology. Ph.D. students are expected to enroll in these formal seminars throughout their program of study. Graduate standing and electronic permission of instructor is required for registration and the course may be repeated for credit.

**EEB 801:** Graduate Student Instructors (GSIs) teaching in EEB for the first time, are required to take this class. EEB 801 is not a formal course, but a mechanism for obtaining
one or two credit hours for teaching. Electronic permission to register for this class is required, and first time GSI’s will be contacted directly via email by Anna Cihak in the Undergraduate Biology Office when they need to register for this class. The class may be repeated for credit. EEB 810 credit does not apply toward credit requirements of any of the Master's programs.

**EEB 990: Dissertation/Pre-candidate** - EEB 990 is the class election for dissertation work by a doctoral student who has not yet advanced to candidacy. The course is usually undertaken with a student’s advisor, with the individual course of study established between the advisor and student, for a total of 1 – 8 credits. Electronic permission to register for this class is required and the class may be repeated for credit. Grading is based on 'S' (satisfactory) or 'U' (unsatisfactory) work.

**EEB 995: Dissertation/Candidate** - EEB 995 is the class election for dissertation work by doctoral students who have advanced to candidacy. The course is undertaken with a student's advisor for a total of 8 credit hours. This number is automatic and students cannot select a different number of credit hours. Special permission to register for this class is required and the class may be repeated for credit. Grading is based on 'S' (satisfactory) or 'U' (unsatisfactory) work. It should be noted that a student must be enrolled within EEB 995 during the full term during which the dissertation defense is held. If the dissertation defense is to take place during the summer, the student must be registered for the Spring/Summer term. Electronic permission to register for this class is required and the class may be repeated for credit.

Candidates wishing to register for a course in addition to EEB 995 should seek prior approval from their faculty advisors. Candidates may elect one course per term without paying additional tuition beyond candidacy tuition. This course may be taken for credit or as a visit (audit). A student who does not elect a course during a term of EEB 995 enrollment may elect two courses in the next term of EEB 995 enrollment; no more than one course may be deferred in this manner (an additional course may not be taken in anticipation of taking none in a future term of EEB 995 enrollment). Candidates who choose to take more courses than those for which they are eligible with candidacy tuition will be assessed additional tuition per credit hour.

**Cognate Courses:** The Rackham School of Graduate Studies recognizes the value of intellectual breadth in graduate education, and the importance of formal coursework in fields of inquiry that lie outside the boundaries of the student's field of study. Therefore, EEB Ph.D. students are required to satisfactorily complete a minimum of 4 hours of graduate-level work in a field other than their field of specialization during their first two years of study in EEB (i.e., before advancing to candidacy). The elected course(s) should be approved by the student's advisor prior to registration. Students may not "visit" the cognate course and must receive either a letter grade or a "satisfactory" grade. Most cognate courses are taught in different departments, but they may be cross-listed in EEB. Courses taught in EEB but in a very different subfield than your own might be allowable, but this must be approved by the GAC and Rackham before you take the course if you want it to apply to the cognate requirement.

Graduate coursework taken elsewhere, after you have enrolled at Michigan, may be considered for cognate credit (e.g., a field course in a discipline cognate to your research taught by a different university at their field station) but cannot count towards the 18 in-
residence credits needed to advance to candidacy. Such cognate credit may not be used to meet the minimum credit hour requirements toward the doctorate. Talk to the graduate coordinator regarding specific circumstances, and get permission from the GAC before you take the course at another university if you want it to apply to the cognate requirement.

Qualifying Examinations:
Ph.D. students must demonstrate that they are qualified to proceed in the Ph.D. program by passing the EEB qualifying examinations (also called preliminary examinations, evaluations, or prelims) in the fall term of their second year. The rationale of the evaluation process is to help the student develop the skills that are necessary in a scientific career. These skills include building a comprehensive base of background knowledge, developing and testing of scientific ideas and hypotheses, and communicating research findings in formal oral and written formats as well as in an informal discussion of scientific matters with colleagues. These areas are represented by the three parts of the evaluation—the review paper, the seminar, and the oral exam.

The evaluation committee consists of three members of the faculty, two of whom are members of the standing EEB evaluation committee. The third member is selected by the student. A student may petition the GAC to add a fourth member to the committee. The committee makes recommendations on student status to the faculty, and these are discussed in detail at a faculty meeting in early December. Faculty recommendations are then reviewed by the GAC before final decisions are made regarding passage of the exam.

The seminar must be given before the oral exam, and the seminar and oral exam cannot be on the same day. The oral exam must be scheduled a minimum of five days after the research paper is submitted to your committee. Contact the graduate coordinator to reserve rooms for the seminar and oral exam. Arrange to publish your seminar notice on the EEB website at least one week prior to your seminar date, and provide the seminar title and relevant information to the graduate office and John Megahan (megaj@umich.edu) for promotional flyers.

At the end of the winter term of the first year students should schedule a mandatory Spring Meeting with their evaluation committee. The time and place for the meeting are arranged by the student. This meeting is designed to give the student a “feel” for what the oral exam will be like in the coming fall term, and to highlight any areas of concern that the student or the committee may have in the student’s preparation for the oral exam or the overall evaluation process. At this meeting the student may also discuss topics for the review paper and seminar with the evaluation committee. The student must provide the evaluation committee with a one page CV and a one page written description of their background (i.e., courses, experience) and research interests at least one day before the meeting.

Review paper: Preparing the review paper is intended to develop a student’s skills in analytical thinking, in formulating research questions and ideas, and in preparing manuscripts and research proposals. The paper topic is the student’s choice, but it should address an issue of broad ecological or evolutionary interest and must be original (e.g., a revised Master’s thesis is not acceptable). An analytical framework which comprehensively reviews and provides a synthesis of a topic and its likely future development is required; papers that are merely catalogues of the literature or factual knowledge are not acceptable. A meta-analysis per se is not required, but the paper must discuss an idea or hypothesis, and examine the support for that idea using an original synthesis of literature, data, or models. The evaluation committee will expect some creativity and original insights in the review paper.
The paper should be prepared in a format appropriate for submission as a manuscript for publication in a review journal, such as the Quarterly Review of Biology or Biological Reviews. The paper should have an abstract of 150-200 words in which the questions, general approach, specific results, and major conclusions are succinctly described. The introduction should describe the general scientific context of the study, the specific questions posed, and the reasons why the questions are significant and interesting (e.g., the context of the study with respect to important scientific unknowns or debates). The **maximum** length is 25 typed double-spaced pages of text (abstract through conclusions, not including references, tables, and figures).

Before beginning the paper, the student should discuss the suitability of possible topics with their advisor and a member of the EEB evaluation committee. The paper topic should be related to the student's current research interests and potentially to the student's dissertation research. Papers written earlier, such as Masters or Honors theses, are not acceptable, although material from such papers may be incorporated into the review paper if approved by the student's evaluation committee. The paper cannot be on the exact same topic as the seminar, but the seminar can address some specific aspect of a broader topic discussed in the paper. Students are encouraged to circulate draft copies of the review paper for comments from other students and faculty, except for faculty on the standing EEB evaluation committee. Writing style, organization, grammar, spelling, and punctuation also will be evaluated. Preparation of the review paper should be initiated during the winter term preceding evaluation (this is one purpose of EEB 700 and 730 seminar courses). The review paper often forms the basis of the student's dissertation proposal that is defended for advancement to candidacy.

**Seminar:** The seminar is intended to develop a student's skills in organizing concepts and results and preparing visual materials for use in an oral presentation. The seminar also develops skill in speaking in front of an audience of interested and knowledgeable peers. The seminar should deal with a specific research project and should have a narrower focus than the review paper; the seminar cannot be a verbal presentation of the research paper. The seminar is typically based on the student's own research, but if this is not possible, other research results may be presented. Seminars must place the specific project or topic into a broader scientific context in the introduction, and at the end should place the results within the framework of future research. The seminar must present scientific questions or hypotheses, explain the experimental approach used to test those ideas, present the data and their analysis clearly, and finally interpret the data with respect to the questions or hypotheses within the broader scientific context originally put forth.

Seminars are open to the public and consist of a 40-minute presentation followed by a 10-minute question period. It is imperative that the seminar stays within this time limit. The seminar must be given before the oral exam, and the seminar and oral exam cannot be on the same day. The student is responsible for coordinating the publication of a flyer that announces of the time and place of the seminar during the week preceding the presentation. Students wishing to receive credit for presenting the seminar may sign up for EEB 800-Section 001.

**Oral examination:** The oral examination is intended to develop the student's ability to discuss science in an informal way with interested and knowledgeable peers. Typically, the first part of the exam is based on the student's review paper and seminar, while the remainder of the discussion may range widely into other areas. We expect that a student will
demonstrate a general knowledge of biology, a good understanding of contemporary ecology and evolutionary biology, and expert knowledge in the topic area of the review paper.

Oral exams typically last between two and three hours. It is the responsibility of the student to arrange the date and time of the oral exam in consultation with members of their evaluation committee.

**The evaluation process:** Each member of the student's evaluation committee independently writes an evaluation of the review paper, seminar, and oral exam, and ranks each as "acceptable," "marginally acceptable," or "unacceptable." Based upon these evaluations, the evaluation committee formulates a recommendation for each student. The committee can recommend that a student (1) proceed to establish a dissertation committee, (2) undertake remedial action and retake all or a portion of the evaluation at a later date, or (3) be separated from the Ph.D. program. These recommendations are presented to the entire EEB faculty at a meeting in early December, at which time they are discussed along with other aspects of the students' performance since entering the program. The EEB faculty may accept, reject, or amend the recommendations of the EEB evaluation committee. The recommendations of the faculty are then communicated to the students, and to the GAC for consideration and action. Students are informed of the final, official outcome of the evaluation process by the GAC. Students may appeal the final decisions, and the appeal process is initiated by writing a letter to the GAC.

For students who retake all or a portion of the evaluation at a later date, general procedures will be similar except students who fail any portion of the exam for a second time will automatically be recommended to the faculty and to the GAC to be separated from the program.

For a retake of a part of the evaluation exam, if a student receives a unanimous pass from the evaluation committee, the GAC will make the final decision and report later to the EEB faculty. If the decision by the evaluation committee is not unanimous or if there are concerns, the recommendation will be presented to the EEB faculty and their recommendation will be reported to the GAC for a final decision.

A student cannot use a departmental fellowship the semester following evaluations if the faculty recommends separation from the Ph.D. program, even if the student transfers to the Master program.
Evaluation schedule, dates, deadlines and student responsibilities:

March-April (before the end of winter term of first year)
- Submit the name of the faculty member chosen to serve as the third member of your evaluation committee.
- Arrange a time for the “spring meeting” with your evaluation committee, and distribute a one page C.V. and a one page description of your background and research interests to your committee members at least one day before the meeting. **This meeting must be completed by 1 May.**

September 1 - 5 (beginning of fall term of second year)
- Confirm or note changes in the composition of your evaluation committee and the topics for your review paper and seminar (send these to the graduate coordinator).
- Start the process of scheduling your seminar and oral exam. Check with the person organizing EEB lunch and try to schedule your seminar during that time slot.

September 30 (fall term, second year)
- By September 30, schedule your seminar and your oral exam for October and/or November with the evaluation committee (the seminar may be given in September if your evaluation committee agrees).
- **Your seminar and oral exam must be completed by Tuesday of the week of Thanksgiving break in November.**
- The seminar must be given before the oral exam, and the seminar and oral exam cannot be on the same day.
- The oral exam must be scheduled a minimum of five days after the review paper is submitted to your committee. The graduate program coordinator will inform you how to reserve rooms for the seminar and oral exam.
- Provide the seminar title and relevant information to the graduate office and John Megahan (**megaj@umich.edu**) for promotional flyers.

Mid-October (fall term, second year)
- Submit copies of your review paper to your evaluation committee and to the graduate program coordinator in the department office. The exact deadline date for submission of all papers will be determined by the evaluation committee. **Papers are due by Friday at 5:00 p.m., the day before fall break begins in mid-October.**
- At the same time give each member of your evaluation committee an evaluation form, which is available in the department office.

Mid-November (fall term, second year)
- All oral exams must be completed by 5:00 p.m. on the Tuesday before Thanksgiving break in November.

Mid-December (fall term, second year)
- Students will be notified of the faculty recommendation and the GAC decision regarding their exams.

**Evaluation committee policy for retakes:** For students who must retake one or two parts of the evaluation procedure, the retakes will be evaluated by the same standing committee and outside member (advisor) who did the first evaluation.

For students who must retake the entire evaluation procedure in the fall term of their third
year, the evaluation committee should include at least one member from the earlier standing evaluation committee, if possible, in order to provide continuity. The second standing member can be a member from the new standing evaluation committee. The outside member (advisor) is chosen by the student as before.

**Dissertation Committee Formation:**

Once a student has passed the qualifying examinations, they should, in consultation with their major advisor, select the members of their dissertation committee. The committee should be established as soon as possible, but not later than the second term of the student’s second year. The dissertation committee is responsible for (1) certifying that the student has met all requirements of candidacy, (2) providing advice concerning the conduct of the thesis research, (3) monitoring progress in research, (4) providing advice on other aspects of professional development, (5) administering the final oral dissertation defense, and (6) certifying that the completed thesis meets the requirements for the Ph.D. degree.

The committee must be established prior to advancement to candidacy and have a minimum of four members. Any changes in the constitution of the dissertation committee must be reported to the graduate coordinator so that a form for revising a committee may be submitted to Rackham. Rackham guidelines governing committee membership and the required Rackham Dissertation Form can be found on the Rackham website. In addition, the EEB First Dissertations Committee Meeting Form, signed by the committee members who have agreed to serve in this capacity, along with an abstract of the proposed thesis, must be submitted to the graduate office.

Rackham requires that a Ph.D. dissertation committee have four members, three of whom must be currently active UM members (i.e. not emeritus). Committees must include:

1) a chair or two co-chairs

2) a cognate member who is an active, regular member of the graduate faculty in a Rackham doctoral program, with an appointment of at least 0.5 FTE in a unit other than EEB, who is familiar with the standards for doctoral research. The cognate member may be emeritus if Rackham approves after supporting documents are submitted to the Rackham Office of Academic Records (OARD).

3) include a minimum of three regular members of the Rackham graduate faculty.

In addition, at least two of the committee members must be regular members of the Department of Ecology and Evolutionary Biology. Committee member types are defined as follows:

**Chair:** The chair (or each co-chair) is responsible for guiding and encouraging the candidate's design and execution of an original, high quality, doctoral level research project. The chair is also expected to play a leading role in the direction of the research and of the writing of the dissertation. The chair is responsible for assuring that all investigations using human beings as subjects of research are reviewed and approved by an appropriately constituted faculty committee charged with this responsibility. If the dissertation committee needs revision, the student is responsible for submitting a revised Rackham dissertation committee form to EEB graduate office which must be approved by the EEB graduate chair before it is forwarded to Rackham for final approval. At the time of the dissertation defense, the composition of the dissertation committee should still include three currently active UM
members (i.e. not emeritus), although Rackham may accept having only two active members if they have previously approved the committee composition.

**Cognate member:** The cognate member of a dissertation committee represents all other Rackham programs and as such must be a regular member of the graduate faculty. If possible, the cognate member should hold an appointment in a cognate or collateral discipline related to that of the student's program or dissertation topic. In this capacity the outside member provides the intellectual stimulus of a faculty member in a related field. A cognate member cannot have a budgeted appointment of 0.5 FTE or more within the EEB department. If a faculty member does not meet the requirements of a cognate member as outlined, they are to be nominated on a special assignment form detailing the qualifications for such an appointment.

**Outside committee members:** To nominate committee members from outside the University, you must attach to the dissertation committee form (a) a Rackham Nomination for special membership form, (b) memorandum from the committee chair addressed to the GAC describing the individual's qualifications for committee service, and (c) a copy of the nominee's C.V. If you have a member who does not have an appointment with the University of Michigan, please see Rackham guidelines governing committee membership.

**Things to consider when selecting dissertation committee members:** A good temperamental and intellectual fit between the candidate, dissertation advisor and committee can be critically important to a productive relationship. Before selecting a dissertation advisor and committee, candidates should speak with other experienced students in the program. Candidates may want to consider the following questions before deciding upon an advisor:

- What is the reputation of the advisor within the field of study?
- How compatible are the advisor's work habits with the student's?
- How long will it take to return written materials with comments? Is the faculty member willing to serve as an editor?
- How accessible is the advisor for discussion? How much time does the advisor spend away from campus?
- How much freedom will be granted in the choice of a dissertation topic?
- How much help will the advisor give in obtaining funding for the students?
- Does the advisor have a reputation for ethical behavior and for being intellectually and psychologically supportive to students?
- How long do students take to complete their degrees with this advisor, and, at least in the case of domestic students, what is the placement record of the advisor's students?

(From Enhancing the Academic Environment for Doctoral Students, University of Michigan Rackham School of Graduate Studies, 1992).

**Categories of committee membership:**

**Regular member of the graduate faculty:** A regular member of the Rackham graduate faculty is any person holding an unmodified appointment at the UM such as Professor, Associate Professor, or Assistant Professor with an earned doctorate from an accredited institution (i.e., Visiting Professors, Adjunct Professors, etc., cannot serve as regular members of a dissertation committee). Regular members of the graduate faculty who are not affiliated with a Rackham doctoral program may serve on the dissertation committee but may not serve as sole chair or as cognate member. They may serve as co-chair with a
regular member of the graduate faculty who is affiliated with a Rackham doctoral program.

**Faculty with dry appointments:** Faculty with 0 fraction appointments (dry appointments) in EEB can be co-chairs on Ph.D. and Master’s committees, but cannot be sole chairs.

**Adjunct faculty:** Adjunct faculty can be co-chairs on Ph.D. and Master’s committees, but cannot be sole chairs.

**Instructors, lecturers, and primary research scientists** who do not hold an appointment as a member of the regular faculty may serve on the dissertation committee provided that they possess an earned doctorate from an accredited institution. They may serve as co-chair if the other co-chair is a regular member of the graduate faculty who is affiliated with a Rackham doctoral program. However, they may not serve as a sole chair or as the cognate member of the committee, with the exception of some primary research staff. For more information, see please see the Rackham guidelines governing committee membership.

**Emeritus professors:** At the formation of a dissertation committee, EEB requires that emeritus professors cannot be sole chairs. On an established dissertation committee, if the sole chair retires, EEB requires that they must change to co-chair status during their first year of retirement. Note that this EEB rule is more stringent than that of Rackham, which accepts an emeritus professor as sole chair of the committee if supplementary documentation is supplied. The student is responsible for submitting a revised Rackham dissertation committee form to the EEB graduate office which must be approved by the graduate chair before it is forwarded to Rackham for final approval.

**Special membership:** University faculty and staff who do not fall into any of the classes cited above and qualified people from outside UM whose service on the dissertation committee would contribute significantly may be nominated for special membership. They may also serve as co-chair with a regular member of the graduate faculty affiliated with a Rackham doctoral program, but not as sole chair or cognate member. No person working toward a doctoral degree may serve on a dissertation committee until all requirements for the degree have been met. A special member need not be employed by UM and need not hold an academic appointment. The special member's expertise in the dissertation topic must be detailed and a C.V. supplied. A special membership form must accompany the dissertation committee form when it is submitted to Rackham.

**Advancement to Candidacy:**
All students who pass the qualifying examinations are expected to achieve candidacy by the end of the following term (typically, the end of the fourth term). Candidacy is achieved when the student has met all Rackham and EEB requirements for the Ph.D. degree, except for the dissertation, including the following:

- Taking the minimum number of credits (18, including four credits of cognate course work) and approval for subsequent dissertation work by the dissertation committee.
- Satisfactory completion of qualifying examinations.
- Submission of an official undergraduate transcript, with the degree posted.
- Satisfactory completion of any course deficiencies (prerequisites to program).
- Completion of all required graduate coursework (other than EEB 995).
- Teaching at least one of the required two terms.
- Demonstrated proficiency in research.
• Completion of at least 4 hours of cognate coursework.
• A minimum GPA of 5.0 (“B” average) or above.
• At least 18 credits of in-residence, graduate-level coursework.

In addition, the candidate must complete a dissertation proposal and be recommended by their dissertation committee for advancement to candidacy.

Before winter break in Winter Term of the second year, the student should hold an initial meeting with the dissertation committee to discuss research plans and the requirements for the proposal. Before the end of the second year, the dissertation committee meets with the student to evaluate the dissertation proposal and to determine the student's readiness to proceed. The dissertation proposal, often written in the format of a grant proposal, must be submitted to committee members at least one week before the meeting. A copy of the approved proposal must be placed in the student's file in the graduate office. On the basis of the dissertation proposal and the meeting, the dissertation committee may recommend (1) advancement to candidacy, (2) revision of the proposal, to be evaluated by the committee in a second meeting, or (3) termination of the student's status in the department. The recommendation of the dissertation committee is reported to the GAC.

If all of these requirements have been met, the graduate program coordinator will complete the necessary paperwork, get the graduate chair's approval, and forward the advancement to candidacy form to Rackham.

Annual meetings:
Between candidacy and degree completion, candidates must meet with their dissertation committee at least once per year before April 2nd to assure satisfactory progress in the program. After each meeting, an Annual Committee Meeting Form, signed by committee members and the student must be submitted to the graduate office. This form will be placed in the student's file and reviewed by the GAC. "Satisfactory progress," based on this report, is one criterion for continued financial support.

Students wishing to obtain an “embedded M.S. degree” during their Ph.D. course of study should notify the graduate coordinator of their intent. After contacting the graduate coordinator, students must “apply for graduation” through the Student Business section of Wolverine Access. Notation of the M.S. degree will then be added to the student's transcript by the Registrar's Office, usually by the end of the following term.

Due to the recent reduction in candidate tuition associated with the Rackham’s continuous enrollment policy, a number of tuition-only fellowships are available to the department for students who are not in residence, but are working on dissertation writing and do not need to be enrolled in classes. Students should contact the graduate coordinator for more information and current availability of fellowships. Tuition-Only fellowships cannot be used in the term in which the student plans to defend their dissertation.

Dissertation defense:
Upon completion of research, students write a dissertation in accordance with the requirements of the Rackham School of Graduate Studies. Once the dissertation is read and approved by the dissertation committee members, the student must present an oral defense of the dissertation. It is a policy of the graduate school that dissertations be published through Rackham. Rackham’s Abstract and Dissertation Format Guidelines provides information for preparing and submitting the dissertation for publication.
The last step in the process is the oral thesis defense. You must schedule a pre-defense meeting with Rackham (OARD.questions@umich.edu) at least 10 business days prior to your oral defense. The student must arrange an oral defense date acceptable to all dissertation committee members and must advertise it in public postings. Copies of the dissertation and a Rackham evaluation form must be presented to the members of the dissertation committee at least two weeks before the oral defense.

The defense consists of a public seminar as well as an oral exam. The doctoral thesis is defended in a public seminar open to all faculty and students in the University. Following the public portion of the defense, the candidate defends their before the dissertation committee, plus any other member of the EEB department who wishes to attend, until a time when the defense meeting becomes closed (only committee members), at the chair’s discretion. After the oral defense, the dissertation committee decides upon the acceptability of the dissertation. The committee may accept or reject the dissertation or recommend further work and re-examination.

Students are guaranteed 10 terms of funding and are expected to defend their dissertation at the end of this time. At the end of their sixth year, students must petition to continue their dissertation committees, and are given notice that their committees will be dissolved if they have not defended by the end of their seventh year. At this time each of the student’s committee members should confirm with the graduate chair the student’s intended term to defend. There are exceptions, but after seven years, a student’s committee will be dissolved.

Students whose committees are dissolved can later defend their dissertation if their committee agrees to reconvene and support their defense. If a student leaves the program, they must complete a withdrawal form, available from the graduate office, with the advisor’s signature. This is to ensure that there is documentation in the student’s file, should it be necessary.

Additional information about the dissertation and the oral defense can be found on the Rackham website.

Ph.D. Student Funding:

EEB provides an outstanding support package to doctoral students, with five years (10 terms + five summers) of departmental funding guaranteed. Funding includes academic year and summer support amounting to an annual stipend of a minimum of $23,000, full tuition waiver, and year-round health insurance. Health insurance is provided for all dependents (spouse, children). Components of the funding package generally include the following, but this formula may be customized based on individual circumstances:

- 2 terms of department fellowship for pursuing graduate research (only one term is available as a pre-candidate)
- 6 terms: GSI (Graduate Student Instructor)
- 2 terms: GSRA (Graduate Student Research Assistantship) support expected from advisor, including two academic terms (i.e. fall and winter) and one summer of support.
- 5 summers of support: department guarantee (includes one term of advisor GSRA support)
Elements of the funding package:

**GSI appointments** provide the primary means of support for EEB Ph.D. students. GSIs facilitate discussions in small sections connected to large lecture courses, run laboratory sections or teach small introductory classes. The typical GSI has a 50% appointment, working between 16.5 and 20 hours per week during the eight-month academic year. During the 2011 – 2012 academic year, the GSI salary for a .50 appointment is $17,702, approximately $8,851 per term. A full tuition waver is included, and as University employees, health and dental benefits are provided for GSIs and their dependents. EEB Ph.D. students are expected to teach in the fall and winter terms of their first year, and for four additional terms during their five years of supported study. A 10-term limit is imposed by the university on GSI and GSRA positions. Resources for university GSIs can be found at the Center for Research and Teaching’s website.

**GSRA appointments** provide Ph.D. students with funding support while conducting their own research or assisting others with research relevant to their own academic goals. GSRA appointments are generally provided through an advisor’s externally funded grant or contract. Tuition waivers generally accompany GSRA appointments, as do health and dental insurance coverage. Faculty advisors are encouraged to provide each of their Ph.D. students with GSRA appointments for a total of three terms, including two academic terms (fall and winter) and one spring/summer term. For additional information on GSRA appointments, see the Academic Human Resources website. GSRA funding is provided in an amount commensurate with GSI rates.

**Department fellowship** support includes a one-term fellowship available during the pre-candidacy period, and a one-term fellowship available after candidacy status has been attained. In addition, four summers of department fellowship funding are guaranteed, with the expectation that one additional spring/summer term will be covered by a GSRA. However, five terms of summer support are guaranteed, even if a GSRA term cannot be provided by the advisor. Fellowships include a full tuition waver and benefits eligibility. Academic year department fellowship funding is provided in an amount commensurate with GSI rates. Beginning in 2011, spring/summer term department fellowship support will be $6,000.

**GradCare** is the medical insurance plan available exclusively to GSIs, GSRAs, and benefit-eligible fellowship holders. GradCare is administered by Blue Care Network and the provider network in Ann Arbor includes University Health Service, the University of Michigan Health System, and participating community pediatricians. There are no deductibles to meet before the plan begins and outpatient services are covered with a co-pay. In-patient hospital services are covered in full for medically-necessary conditions. Prescription drug coverage is also provided. For more information, visit the UM Benefits Office website.

In addition to these components of the EEB funding package, research and supplemental funding are available to EEB Ph.D. students through a variety of departmental sources including Block Grant programs and awards, and department-administered scholarships. These are listed starting on pg. 42, along with other university and external funding sources.

**Remaining “In good standing” within the Ph.D. Program:**

During their tenure in EEB, students must comply with the following definition of “in good
standing,” adopted 20 April 2009:

EEB considers five separate situations where a student may lose the academic or language proficiency status of "in good standing," in addition to the current rules and regulations of the Rackham Graduate School. The loss of good standing automatically results in the department removing the student from its program, and requesting that Rackham remove the student from all active listings. Note that in all situations described below, the student may petition the Graduate Affairs Committee (GAC) for a reconsideration of their change in standing.

1) A student fails to register for classes or notify the department of their progress or status in the program for two consecutive academic semesters. After the first semester of no contact the student will be notified (at their official University address and contact information) that they are in non-compliance. If the student fails to register for a second semester, or does not respond adequately to correct their status within two semesters, their dissertation committee will be dissolved and the department will consider the student removed from the program.

2) A student fails to pass their English Language Institute (ELI) exam within their first year of study. Successful completion of this exam is required to hold a GSI position. The student will typically have three chances to pass the ELI exam—in August just before their matriculation in the fall term, at the end of their first semester (December), and during their second semester (winter term). The student may petition the GAC to continue in the program without passing their ELI exam, but Rackham requires two terms as a GSI to complete a Ph.D.; such a petition would require the full support of an advisor.

3) A student is recommended by the faculty to be separated from the program after failing the Department’s preliminary examinations. The student may petition the GAC to retake these examinations, but approval of this request requires the full support of an advisor. If approved, the student is again in good standing. The details of what constitutes failure of the preliminary exams are found in the current EEB policies.

4) A student surpasses the departmental -ix year limit of enrollment in the Ph.D. program, and their dissertation committee is dissolved. The student may petition the GAC to continue or re-form the dissertation committee, but approval of this request requires the full support of an advisor and the constitution of an appropriate committee. If approved, the committee is re-formed and the student is again in good standing.

5) A student is unable to find a suitable major advisor or suitable co-advisors in either the pre-candidate or candidate phase of graduate work. An EEB faculty advisor must consent to mentor a student and guide them through the preliminary examination process prior to candidacy, and after candidacy a dissertation committee must be formed according to Rackham rules to guide the student through completion of the program of study. The current advisor is responsible for notifying the student and the GAC if there is a change in mentoring status. If an appropriate new advisor cannot be found or a new committee formed in a timely manner, the student loses the status of "in good standing."
Traditional Master’s Program, Requirements, and Funding

Program requirements:
The Traditional Master’s degree program is flexible and serves a variety of career objectives, such as teaching in secondary schools, employment in a variety of research-oriented jobs, interpretive work in parks and nature centers, and preparation for further professional training. A Traditional Master’s degree can be earned either through graduate course work alone, or through graduate course work and a Master’s thesis (these options are described below). The Master’s degree is NOT a prerequisite for admission to the doctoral program, nor is it intended as probationary admission to the doctoral program.

Students applying to the Traditional M.S. program are expected to have a solid foundation in the biological sciences. In addition, they are recommended to have completed the following college level courses: Physics (two semesters of lectures or one semester of lecture and one semester of lab); Calculus (one semester); Organic Chemistry (two semesters of lectures and one semester of lab.)

Advising
An advising committee for incoming students, comprised of the graduate chair and a faculty advisor will meet with each student upon his/her arrival to discuss the student’s academic background. The committee will decide whether to require additional background courses such as those recommended in the admission policy or alternative courses the committee deems necessary for individual students. Results of the committee’s meeting with each student, including any additional courses the committee requires, will be placed in the student’s file.

Students are required to obtain advisor approval for all initial course elections, including courses elected at the Biological Station, and to have their election worksheets signed by their advisor or the committee chair for each semester thereafter. A student may change advisors by petitioning the Graduate Affairs Committee. For students pursuing the thesis option, it is assumed that the student’s thesis advisor will take on this role once the thesis committee is formed. It is essential that students seek advice from an advisor during all phases of their graduate program.

The Graduate Affairs Committee, is responsible for counseling and for the development and administration of the Master’s program. Petitions and problems that students might encounter should be directed to the GAC, through contact with the graduate coordinator. A student representative attends all committee meetings and contributes to all decisions made by the committee.

Degree options:

Master’s degree by course work:
The degree requires completion of 24 graduate credit-hours in EEB and other science-related courses; at least 16 hours must be selected from courses in the Department of EEB. No more than six hours of research courses may be included in the minimum of 24 hours required. Only graduate-level courses (numbered 400 and above) can be included in the required credit toward the program. Election of courses is determined in consultation with the program director or a faculty advisor, and is based on the goals of the individual student.
The program must include one seminar course which requires an oral presentation, or a written report. By Rackham rule, students must complete four hours of graduate-level cognate course work offered by a department other than EEB. Cognates should be a science-related course, or one that is relevant to the program. For a list of suggested cognate courses, consult the EEB website.

**Master’s degree by thesis:**
In addition to coursework requirements described above, the student prepares a thesis describing original research carried out under the guidance of a thesis committee. Up to six credit hours may be accumulated on the thesis research project and included in the minimum 24 hours required by Rackham.

A thesis committee consists of the student's primary advisor plus two additional members, one of whom must be from EEB. The student chooses all members, usually by the winter term of their first year in the program. Following preliminary, informal discussions with thesis committee members, the student is expected to prepare a thesis proposal outlining the thesis research. The student then meets formally with the full committee to present and discuss the proposal—approval of the proposal by the committee is recorded by their signature on a approval form which must be returned to the graduate coordinator. For most students, this step will be completed by March or April of the student's first year.

**Function and constitution of the thesis committee**
For EEB Master’s students, the thesis committee is charged with the supervision of a student’s thesis activities. The entire committee is intended to be a resource upon which the student may draw throughout the period of the thesis-oriented research. It should guide and encourage the student in the design and execution of the research program and in the writing of the dissertation. Committee members must certify that the student has passed the oral examination, and has produced a thesis that is satisfactory in every way. The student chooses a chair or co-chairs who will act as the primary director of the student's research. Together they choose other faculty who may be expected to supply a high degree of expertise in the special area of the thesis, and whose appointment will satisfy the following requirements.

The thesis committee is responsible for (1) providing advice concerning the conduct of the thesis research, (2) monitoring progress in research, (3) providing advice on other aspects of professional development, (4) administering the final oral thesis defense, and (5) certifying that the completed thesis meets the requirements for the M.S. degree.

**Things to consider when selecting thesis committee members:** See Ph.D. Committee formation pg. 24.

**Thesis defense:** Upon completion of research, students write a thesis in accordance with the requirements of the Rackham School of Graduate Studies. Once the thesis is read and initially approved by the thesis committee members, the student must present an oral defense of the thesis.

The student must arrange an oral defense date acceptable to all thesis committee members and the defense must be advertised in public postings. The master’s thesis is defended in a public seminar open to all faculty and students in the University. Following the public portion of the defense, the student defends his/her thesis before the thesis committee, plus any other member of the EEB department who wishes to attend, until a
time when the defense meeting becomes closed (only committee members), at the chair’s discretion. After the oral defense, the thesis committee decides upon the acceptability of the thesis. The committee may accept or reject the thesis or recommend further work and re-examination. The student must submit a signed Master’s Thesis Graduation Form, available in the Graduate Office, to the Graduate Affairs Committee. Upon review and approval by the GAC, it will be recommended to Rackham that the student receive a “M.S. Thesis” notation on their final official transcript.

Financial support:
Students in the Traditional Master’s program are eligible for Graduate Student Instructor (GSI) appointments in the Department of EEB; but no guarantees of appointment are made for Traditional M.S. students. Other external sources such as loans and work-study programs are available through the University’s Office of Financial Aid, 2011 Student Activities Building. Students planning to enter a master’s program are eligible to apply for external fellowships, such as the National Science Foundation (NSF) or NASA. These fellowships provide substantial stipends plus full tuition and students are urged to apply. Some students may wish to hold a part-time position with a University unit and carry a reduced academic program, or they may be able to obtain fellowship support. Positions are variable in kind and availability, and are best found by applying in person to the Student Employment Office, 2503 Student Activities Building, in the summer prior to the fall term registration.

For more information on University and external funding, see pg. 42.

Rackham requirements:
The Horace H. Rackham School of Graduate Studies specifies the general requirements for admission and degree programs as well as other general standards. Therefore, in addition to the specific requirements of the EEB program, applicants and students should also be familiar with, at minimum, the following Rackham requirements.

**Time limit:** A student in a terminal master's program is expected to complete all work within five years from the date of first enrollment in the program. Students exceeding this time limit must file a petition for modification or waiver of regulation with Rackham OARD. Petitions must describe explicitly the amount of work remaining and a timeline for completion. A student who fails to complete degree requirements within five years may be withdrawn and required to apply for readmission (section 1.3.8).

**Residence requirement:** The graduate school requirement involves credit hours and should not be confused with state residency requirements.

**Minimum average grade of “B”:** An overall grade point average of “B” (5.00) is required for all graduate courses taken for credit and applied toward the Master’s degree.

**Transfer of credit:** A maximum of six semester hours (inter-University), or half of the program (intra-University and inter-University combined) may be transferred.

**Cognate requirement:** Rackham recognizes the value of intellectual breadth in graduate education, and the importance of formal graduate study in areas beyond the student's field of specialization. Cognate courses are those that are in a discipline or area different from a student's field of study, but may be related to some aspect of this field. Cognate coursework must be approved by the department or program, and may be satisfied by:
1. Completing 4 credit hours of cognate coursework in approved graduate-level courses with a grade of B- or better.
2. Using coursework within the same department or program but in a subfield different from the student's own. A course in a student's program that is cross-listed as a course in another program may satisfy the cognate requirement. In this case, the department or program should notify Rackham OARD.
3. Using credit officially transferred from another institution in another field of study.
4. Completing graduate coursework at another institution that meets the expectation of the cognate requirement without officially transferring the credit to the transcript. The student must provide Rackham OARD with an official transcript, including the courses and credit hours, and the department or program should notify Rackham OARD. These courses do not apply toward the minimum requirement for the degree, and do not appear on the University transcript.

Diploma Application:
To be recommended for a Master's degree, students must have their advisors complete the EEB M.S. Checkout Form and submit it to the graduate coordinator for additional approvals. Upon submission of the form, students should "apply to graduate" through the "Student Business" section of Wolverine Access. Application deadlines for each term are published by Rackham. A student who fails to complete all requirements during the term in which the degree application is submitted must reapply to be considered again for the degree. Master's diplomas are not distributed at commencement, but are mailed seven to eight weeks later.
Frontiers Master’s Program Overview:
Incoming students begin with an eight-week program at the Biological Station in Pellston, Michigan, during the summer term. Students register for one class, as well as participate in a weekly Frontiers Career Development Seminar, where students will read Karban & Huntzinger’s *How to Do Ecology: A Concise Handbook*. At the seminar, students will discuss their research projects and give short presentations. Students will also focus on career and team-building discussions and attend other UMBS activities as possible, including all-camp lectures, selected REU and BART workshops, symposia, field trips and so on. Additionally, Frontiers students will work with a faculty research mentor to complete a short research project. Mentors will be assigned by the program director. It is up to the student to make contact with their mentor, discuss project options, and arrange a schedule of work and progress meetings.

Starting fall term in Ann Arbor, students take EEB 477: Field Ecology (1st half of the semester) and participate in a lab rotation (EEB 730, 2nd half of the semester) arranged with the Program Director and a faculty advisor. In the winter term, students will choose a research advisor with whom to work during their remaining time in the program.

Students admitted to the Frontiers M.S. program are expected to have a solid foundation in the biological sciences. In addition, they are recommended to have completed the following college level courses: Physics, two semesters of lectures or one semester of lecture and one semester of lab; calculus, one semester; organic chemistry, two semesters of lectures and one semester of lab.

Frontiers Master’s Program requirements and expectations:

**First Term: Summer at UM Biostation**
- Enroll in one UMBS course (e.g., Introduction to Ecology OR Evolution).
- Summer research project with UMBS research mentor. UMBS research experience may or may not be directly related to future Master’s research.
- Career Development Seminar with Frontiers director.
- Participation in camp-wide lectures and events, as possible.

**Second Term: Fall at Ann Arbor Campus**
- Take Biology GSI training course (EEB 801) and GSI for appropriate EEB/BIO course during academic terms.
- Participation in EEB 477: Field Ecology Lab with Vandermeer and Perfecto.
- Participation in EEB 730 (one 8-week lab rotation) after field course is finished.

**Subsequent Terms:**
- Chose a permanent advisor for thesis research project by the end of the fall semester, first year. During the winter term of the first year, form a thesis committee (advisor + two other members, one of which is from another department) See pg. 24 for more information on forming your thesis committee and defending your thesis).
- Enroll in other courses as discussed with the program director and/or a faculty advisor.
- Choices in future coursework will be made with this permanent advisor and/or the program director.
- Participate in advisor’s lab meetings and journal club during the second year.
Course requirements:
The degree requires completion of 25 graduate credit-hours in EEB and other science-related courses; at least 16 hours must be selected from courses in the Department of EEB. No more than six hours of research courses may be included in the minimum of 25 hours required. Only graduate-level courses (numbered 400 and above) can be included in the required credit toward program. Election of courses is determined in consultation with the program director or a faculty advisor, and is based on the professional goals of the individual student. The program must include one seminar course which requires an oral presentation, or a written report. Students must also complete four hours of graduate-level cognate course work. The cognate course must be offered by a department other than EEB, and should be a science-related course or one that is relevant to the program (e.g., Stat 402; Biochem 515; Geol 418). For a list of suggested cognate courses, check the EEB website.

Advising
The Frontiers director will review each student’s academic background and decide whether to require additional background courses such as those recommended in the admission policy or alternative courses the director deems necessary for individual students. Results of the Director’s meeting with each student, including any additional courses the director requires, will be placed in the student's file. Courses the director requires will be clearly distinguished from those recommended by the director.

Students are required to obtain advisor/director approval for all initial course elections, including courses elected at the Biological Station. It is assumed that the student’s thesis advisor will take on this role once the thesis committee is formed. It is essential that students seek advice from an advisor during all phases of their graduate program. Students should feel free to gain more guidance by meeting with the program director, the graduate chair, and/or their faculty advisor. A student may change advisors, but any such change must be approved by the Frontiers program director and/or the Graduate Affairs Committee.

The Graduate Affairs Committee, composed of three faculty members, and the Frontiers program director are together responsible for counseling and for the development and administration of the Frontiers program. Petitions and problems that students might encounter should be directed to the Frontiers director and/or the GAC. A student representative attends all committee meetings and contributes to all decisions made by the committee.
### Curriculum:

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<td><strong>Summer</strong></td>
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<td>Fall</td>
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<tr>
<td>1 UMBS class</td>
<td>Orientation (1st week)</td>
<td>EEB 790 Thesis hours</td>
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<td>(generally either</td>
<td>Register for EEB 477</td>
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<td>EEB 381/581 or</td>
<td>(5hrs), EEB 730 lab</td>
<td>EEB 800 seminar (1hr)</td>
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<td>EEB 390/590)</td>
<td>rotation (2hrs), &amp; EEB 801 (1hr)</td>
<td>Participate in advisor’s</td>
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<td>Summer research</td>
<td>Choose primary advisor.</td>
<td>lab meetings and journal club</td>
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<td>project</td>
<td>Discuss winter classes with</td>
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<td>Frontiers Career</td>
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<td>Seminar</td>
<td>Frontiers director</td>
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<td>Other UMBS lectures</td>
<td>and events as possible</td>
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<td>Register for 6hrs of</td>
<td>EEB 790 Thesis hours</td>
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<td>classes (4hrs for a</td>
<td>(6hrs)</td>
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<td>cognate)</td>
<td>Meet with thesis</td>
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<td></td>
<td>Form thesis committee</td>
<td>Participate in advisor’s</td>
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<td></td>
<td>(turn in form to</td>
<td>lab meetings and journal club</td>
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<td>graduate office)</td>
<td>Defend thesis</td>
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<td>Work on research either</td>
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<td>on campus, at the BioStation, or</td>
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<td>at another appropriate location</td>
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<td><strong>Spring/Summer</strong></td>
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*Must be registered for a minimum of 6 hours during each semester that you are a GSI*

### Thesis information:

In addition to the coursework requirements, Frontiers M.S. students are expected to prepare a thesis describing original research carried out under the guidance of a thesis committee. Up to six credit hours may be accumulated on the thesis research project and included in the minimum 24 hours required by Rackham (25 hours required by EEB).

A thesis committee consists of the student’s primary advisor plus two additional members, one of whom must be from EEB. The student chooses all members, usually by the winter term of their first year in the program. Following preliminary, informal discussions with thesis committee members, the student is expected to prepare a thesis proposal outlining the thesis research. The student then meets formally with the full committee to present and discuss the proposal—the approval of the proposal by the committee is recorded by their signature on a proposal approval form which must be returned to the graduate coordinator. For most students, this step will be completed by March or April of the student’s first year in order for the student to conduct thesis research over the summer months. It is expected that thesis research will be completed within 2 years.

#### Function and constitution of the thesis committee:

For EEB Master’s students, the thesis committee is charged with the supervision of a student’s thesis activities. The entire committee is intended to be a resource upon which the student may draw throughout the period of the thesis-oriented research. It should guide and encourage the student in the design and execution of the research program and in the writing of the dissertation. Committee members must certify that the student has passed the
oral examination, and has produced a thesis that is satisfactory in every way. The student chooses a chair or co-chairs who will act as the primary director of the student's research. Together they choose other faculty who may be expected to supply a high degree of expertise in the special area of the thesis, and whose appointment will satisfy the following requirements.

The thesis committee is responsible for (1) providing advice concerning the conduct of the thesis research, (2) monitoring progress in research, (3) providing advice on other aspects of professional development, (4) administering the final oral thesis defense, and (5) certifying that the completed thesis meets the requirements for the M.S. degree.

**Things to consider when selecting thesis committee members:** See Ph.D. Committee formation page 24.

**Thesis defense:** Upon completion of research, students write a thesis in accordance with the requirements of the [Rackham School of Graduate Studies](https://gradschool.umich.edu/rackham/). Once the thesis is read and initially approved by the thesis committee members, the student must present an oral defense of the thesis.

The student must arrange an oral defense date acceptable to all thesis committee members and must advertise it in public postings. The defense also includes an oral exam. The master's thesis is defended in a public seminar open to all faculty and students in the University. Following the public portion of the defense, the student defends his/her thesis before the thesis committee, plus any other member of the EEB department who wishes to attend, until a time when the defense meeting becomes closed (only committee members), at the chair’s discretion. After the oral defense, the thesis committee decides upon the acceptability of the thesis. The committee may accept or reject the thesis or recommend further work and re-examination. The student must submit a signed Master's Thesis Graduation Form, available in the Graduate Office, to the Graduate Affairs Committee. Upon review and approval by the GAC, it will be recommended to Rackham that the student receive a “M.S. Thesis” notation on their final official transcript.

**Financial support:**
Frontiers is a fully-funded master’s program, including an annual stipend of at least $23,000, a tuition waiver, and health care for each student, as well as his or her spouse and dependents. Students are guaranteed six total terms of funding; including two summers, and are expected to defend their thesis at the end of this time.

Frontiers students are funded during the academic year as Graduate Student Instructors (GSIs). GSIs facilitate discussions in small sections connected to large lecture courses, run laboratory sections or teach small introductory classes. The typical GSI has a 50% appointment, working between 16.5 and 20 hours per week during the eight-month academic year. During the 2011-2012 academic year, the GSI salary for a .50 appointment will be $17,702, or approximately $8,851 per term. A full tuition waiver is included, and as University employees, health and dental benefits are provide for GSIs and their dependents. Frontiers students are also guaranteed two terms of summer stipend support, starting with Summer Term at the UMBS at the beginning of the program.

Graduate Student Research Associate (GSRA) appointments may be available, and provide students with funding support while conducting their own research relevant to their academic goals. GSRA appointments are generally provided through an advisor’s externally funded grant
or contract. GSRA stipend amounts are consistent with those announced annually by the Office of Academic Human Resources. Tuition waivers generally accompany GSRA appointments, as does health and dental insurance coverage through the GradCare Program. For additional information on GSRA appointments, see the Academic Human Resources website. GSRA funding is provided in an amount commensurate with GSI rates.

Other external funding sources such as loans and work-study programs are available through the University’s Office of Financial Aid, 2011 Student Activities Building. Students are eligible to apply for external fellowships, such as the National Science Foundation (NSF) or NASA. These fellowships provide substantial stipends plus full tuition and students are urged to apply. The UM Student Employment Office website contains information regarding additional employment opportunities.

GradCare is the medical insurance plan available to Frontiers M.S. students and their eligible dependents in association with their GSI appointment, or summer fellowship status. GradCare is administered by Blue Care Network and the provider network in Ann Arbor includes University Health Service, the University of Michigan Health System, and participating community pediatricians. There are no deductibles to meet before the plan begins and outpatient services are covered with a co-pay. In-patient hospital services are covered in full for medically-necessary conditions. Prescription drug coverage is also provided. For more information, visit the UM Benefits Office website.

In addition to these components of the EEB funding package, research and supplemental funding are available to EEB Frontiers M.S. students through a variety of departmental sources including Block Grant programs and awards, and department-administered scholarships.

Rackham requirements:
The Horace H. Rackham School of Graduate Studies specifies the general requirements for admission and degree programs as well as other general standards. Therefore, in addition to the specific requirements of the EEB program, applicants and students should also be familiar with, at minimum, the following Rackham requirements.

**Time limit:** A student in a terminal master's program is expected to complete all work within five years from the date of first enrollment in the program. Students exceeding this time limit must file a petition for modification or waiver of regulation with Rackham OARD. Petitions must describe explicitly the amount of work remaining and a timeline for completion. A student who fails to complete degree requirements within five years may be withdrawn and required to apply for readmission (section 1.3.8).

**Residence requirement:** The graduate school requirement involves credit hours and should not be confused with state residency requirements.

**Minimum average grade of “B”:** An overall grade point average of “B” (5.00) is required for all graduate courses taken for credit and applied toward the Master’s degree.

**Transfer of credit:** A maximum of six semester hours (inter-University), or half of the program (intra-University and inter-University combined) may be transferred.

**Cognate requirement:** Rackham recognizes the value of intellectual breadth in graduate education, and the importance of formal graduate study in areas beyond the student's field of specialization. Cognate courses are those that are in a discipline or area different from a
student's field of study, but may be related to some aspect of this field. Cognate coursework must be approved by the department or program, and may be satisfied by:

1. Completing 4 credit hours of cognate coursework in approved graduate-level courses with a grade of B- or better.
2. Using coursework within the same department or program but in a subfield different from the student's own. A course in a student's program that is cross-listed as a course in another program may satisfy the cognate requirement. In this case, the department or program should notify Rackham OARD.
3. Using credit officially transferred from another institution in another field of study.
4. Completing graduate coursework at another institution that meets the expectation of the cognate requirement without officially transferring the credit to the transcript. The student must provide Rackham OARD with an official transcript, including the courses and credit hours, and the department or program should notify Rackham OARD. These courses do not apply toward the minimum requirement for the degree, and do not appear on the University transcript.

Diploma application: To be recommended for a Frontiers Master’s degree, students must have their advisors complete the EEB M.S. Checkout Form and submit it to the graduate coordinator for additional approvals. Upon submission of the form, students should “apply to graduate” through the “Student Business” section of Wolverine Access. Application deadlines for each term are published by Rackham. A student who fails to complete all requirements during the term in which the degree application is submitted must reapply to be considered again for the degree. Master's diplomas are not distributed at commencement, but are mailed seven to eight weeks later.
Graduate Funding Resources
The following provides information regarding research funding sources, as well as fellowships that include stipend and tuition funding. This information can also be found on the EEB website.

Please note that students cannot receive a departmental fellowship for stipend and tuition and an external fellowship or traineeship at the same time. Awards for stipend and tuition are subject to the EEB Department Substitution Policy. (See pg. 48, for more information.) If necessary, external fellowship funding is supplemented by the department to equal the current, minimum GEO-negotiated GSI stipend. Prospective students who are U.S. citizens or have permanent resident status in the U.S. are urged to apply for national fellowships. Foreign students are urged to apply for financial support from their home countries.

Department Funding: The EEB graduate office provides announcement of these awards. Watch for emails regarding deadlines and submission requirements!

Helen Olson Brower Memorial Fellowship – An endowed fellowship for doctoral student(s) whose research is in the area of environmental studies. One award will be made for use during the academic year which will include one semester of stipend, tuition and GradCare benefits. Awardees must send a brief note of thanks and a layperson summary of findings to the Offutt family, the fellowship’s sponsor. The competition is typically announced in late November, with a mid-January deadline for submission.

Edwards Fellowship - This award is given via a generous bequest of Julia A. Edwards for use in the recruitment of new doctoral students and to support current students whose distinguished performance is considered worthy of special recognition. One or two awards will be made for use during the academic year which will include one semester of stipend, tuition and GradCare benefits. The competition is typically announced in late November, with a mid-January deadline for submission.

Block Grant Funding - Block grant funding is provided to the EEB department by the Rackham School of Graduate Studies. These grants are supplemental to other funding sources and are intended to help advance research completion of graduate degrees. EEB graduate students who are actively engaged in research are eligible to apply. In most cases, students are expected to have completed one year in their respective programs; however, first-year students who are already engaged in research may be considered for an award. The number and amount of Block Grant awards varies each year, depending on available funding and the number of successful applicants.

Several endowed research awards are also awarded through the Block Grant completion process to students who best fit the intentions of the donors. Endowed research awards include:

The Emma J. Cole Fellowship - Awarded to graduate students in Plant Biology for research and travel expenses. This award is based on excellence, merit and financial need. Students are generally allowed to receive this award one time only.

The Peter Olaus Okkelberg Award - Presented to graduate students in broadly defined fields of zoology. Areas of study sponsored are anatomy (including morphology), cytology (including cell biology), and embryology (including developmental biology). The award may be given for research and travel expenses. This award is based on excellence and merit.

The Angeline B. Whittier Fellowship - Awarded to advanced graduate students of plant biology for research and travel expenses. Students may be considered for both Cole and Whittier Fellowships.

Lewis and Elaine Wehmeyer Fund in Fungal Taxonomy – This endowment primarily supports the Wehmeyer chair in fungal taxonomy, but has some funds available for graduate students working in this field.
Underwood-Alger Scholarship Fund - This scholarship is available to assist graduate and undergraduate students in the biological sciences at the University of Michigan. Preference is given to female students. Special consideration is given to those applicants who have at least one parent who is a U.S. citizen, and whose family situation makes tuition difficult but prevents them from receiving other financial aid. In addition, special consideration is given to applicants who can demonstrate that an ancestor rode on the Mayflower or was an active participant in the Revolutionary War.

Block Grant and endowment funding are awarded annually on a competitive basis. Applications and student records are reviewed by the Graduate Affairs Committee as part of the award process and decisions are based on factors such as promise of research, adequacy of research plans, schedule for use of the funds, and past progress. The competition is typically announced in at the end of January, with a mid-March submission deadline. Funds become available on May 1st of the year in which they are awarded and are available to students for 18 months. If funds are not used during this period, or if a student graduates prior to using awarded Block Grant funding, the funds are retained by the department.

Research funding and fellowships are also available through endowments in the Museum of Zoology and Herbarium; more information on these awards will be distributed in the fall.

Matthaei Botanical Gardens Fellowship - Funds from the Matthaei Botanical Gardens are available to support research at the Matthaei Botanical Gardens. The application deadline details are announced in early December.

E. S. George Reserve Scholarships – E. S. George Reserve Scholarships generally include awards of $4,000 - $6,000 (with larger amounts possible under exceptional circumstances) in the form of a lump-sum payment that may be used by recipients in whatever manner will best enhance their research on the E. S. George Reserve. To be eligible for an award, a graduate student must have been admitted to candidacy. The E. S. George Reserve Advisory Committee evaluates applications and makes decisions regarding awards. An announcement of awards takes place in mid-February and awards are announced in late March.

Department $100 Research Award – EEB graduate students may apply to the department for up to a $100 each fiscal year for equipment or supplies. Request forms are available at the EEB Funding Opportunities website or in the graduate office, and must be submitted to the graduate office for review and approval. Copy charges and costs associated with publications (page charges or reprints) are not applicable. Original receipts are mandatory for reimbursement and funds must be spent each year by June 30, the end of the fiscal year. There is no carry-over of funds from year to year.

Department $250 Conference Travel Award: Each fiscal year, EEB graduate students may apply for one grant of $250 for travel to a conference at which the student presents a paper or a poster. Request forms are available at the EEB Funding Opportunities website or in the graduate office, and must be submitted to the graduate office for review and approval prior to the conference. Original receipts are mandatory for reimbursement and funds must be spent each year by June 30, the end of the fiscal year. There is no carry-over of funds from year to year.

Other UM Funding Sources: Students have access to a variety of other UM internal funding opportunities. The Rackham Graduate School has many funding opportunities, from one year fellowships to grants for travel to conferences, as do the International Institute and the UM Center for the Education of Women. See individual websites for more information on fellowships available through these resources. The Office of Financial Aid (OFA) also offers a number of resources for graduate students.

Graham Environmental Sustainability Institute - The Graham Institute is a collaborative partnership of schools, colleges and units across the U-M. The Graham Institute fosters cross-disciplinary collaboration
to create and disseminate knowledge and to offer solutions related to complex sustainability issues. On a broader scale, the Graham Doctoral Fellowship Program helps to create a "Community of Scholars," by which the Graham Fellows can collaborate, engage, and interact—both during their doctoral studies, as well as for years to come. During the fellows' period on campus, academic associations are cultivated through monthly seminars, annual retreats, workshops, and other Graham-sponsored forums. Each year, the Graham Institute competitively selects and admits six doctoral students into the Graham Doctoral Fellowship Program. As a recipient of this honor, each Graham Fellow receives $25,000 per year for two years to help support their doctoral-level research and studies. Applicants are reviewed by a strict set of criteria and considered only if their doctoral research projects are related to environmental sustainability.

Sweetland Summer Dissertation Writing Institute - This program offered by the Sweetland Writing Center, is specifically designed to help students make effective progress on their dissertation writing. Nomination by the student’s department is required, and participants are required to attend the Sweetland Writing Center for at least six hours each weekday during spring term. Sweetland faculty member are available for daily writing consultation and participants are supplied with a computer, if they do not have their own laptop, and an office where they can leave books and other scholarly materials. In addition, students are expected to participate in the group discussions, where they will share their writing and receive feedback. Participants are provided with a stipend of $3,000 for the spring term. Applications are due to the Sweetland Writing Center in mid-March.

Training Grants:

National Institutes of Health - Genome Science Training Program - Provides support for pre- and post-doctoral training at the interface of statistical, computational, and molecular genetics under support from the National Human Genome Research Institute of the National Institutes of Health. Training support may be for up to three years. Pre-doctoral trainees can be new applicants to a relevant University of Michigan graduate program: Biostatistics; Human Genetics; Ecology and Evolutionary Biology; Epidemiology; Mathematics; Molecular, Cellular and Developmental Biology; or Statistics; or continuing Michigan students at any stage in their graduate studies. Pre-doctoral trainees are provided with full tuition (two semesters) and a stipend. Post-doctoral trainees receive the standard NIH stipend level, which is based on years of post-doctoral experience. Trainees also receive travel funds towards attendance at a scientific meeting. United States citizens and permanent residents are eligible to apply.

National Institutes of Health - Interdisciplinary Training Program in Infectious Disease (IPID) - Provides support for pre-doctoral and post-doctoral training at the interface of epidemiology, microbiology, complex systems, mathematics, statistics, and medicine. It is supported by the National Institute of Allergy and Infectious Diseases of the National Institutes of Health. Training support may be for up to three years. Pre-doctoral trainees can be new applicants to a relevant University of Michigan graduate program: Biostatistics; Human Genetics; Ecology and Evolutionary Biology; Epidemiology; Mathematics; Molecular, Cellular and Developmental Biology; or Statistics; or continuing Michigan students at any stage in their graduate studies. Pre-doctoral trainees are provided with full tuition (two semesters) and a stipend. Post-doctoral trainees receive the standard NIH stipend level, which is based on years of post-doctoral experience. Trainees also receive travel funds towards attendance at a scientific meeting. United States citizens and permanent residents are eligible to apply.

Major External Fellowships and Awards:

Science to Achieve Results (STAR) Program - The STAR Program of the Environmental Protection Agency (EPA) has four formal solicitation periods during the year—January, April, August and October. Forms necessary for completing an application are noted in the announcement and are available on the website.

National Institute of Health - Individual Predoctoral Fellowships to Promote Diversity in Health-
Related Research - Encourages students from underrepresented racial and ethnic groups, individuals with disabilities, and individuals from disadvantaged backgrounds to seek graduate degrees in the biomedical and behavioral sciences to help increase the number of well-trained scientists from underrepresented groups. The fellowship provides up to 5 years of support for research training leading to the Ph.D. or equivalent research degree, the combined M.D./Ph.D. degree, or other combined degrees in the biomedical or behavioral sciences. At the time of appointment, students must be U.S. citizens, noncitizen nationals, or lawfully admitted to the U.S. for permanent residence. Individuals on temporary or student visas are not eligible.

The National Science Foundation website lists available funding opportunities, by subject. A few of these, which EEB students have recently received, are described in more detail, below.

National Science Foundation Doctoral Dissertation Improvement Grant - The National Science Foundation awards Doctoral Dissertation Improvement Grants in selected areas of the biological sciences. These grants provide partial support of doctoral dissertation research to improve the overall quality of research. Allowed are costs for doctoral candidates to participate in scientific meetings, to conduct research in specialized facilities or field settings, and to expand an existing body of dissertation research. Proposals whose focus falls within the scope of any cluster in the Division of Environmental Biology (DEB) or in the scientific area of animal behavior supported by the Behavioral Systems Cluster in the Division of Integrative Organismal Systems (IOS) are eligible. The duration and grant amount are flexible but must be justified by the scope of work and documented in the proposal. Grants are typically awarded for periods up to 24 months and for amounts up to $15,000. These awards are intended to provide supplemental funds for items not normally available from the student's university or other sources. They are not intended to provide the total costs of a student's dissertation research.

National Science Foundation Graduate Research Fellowship – The National Science Foundation (NSF) Graduate Research Fellowship, is a National competition for graduate students in Science, Engineering and Math programs. The award includes a three-year tenure for beginning graduate students in the fall term, or those who will have had less than one full year of graduate study. Stipends are $30,000 per year and tuition.

Smithsonian Institution Fellowship - Awarded to support independent research in residence at the Smithsonian Institution. Predoctoral fellowships and directed research fellowships are available in the following disciplines: American history, material analysis, anthropology, biological sciences, earth sciences, history of art. Stipends range from $3,000 for ten week study to $14,000 plus allowances for a one year grant.

Other External Funding Sources: Many other organizations also offer fellowships for students, including opportunities specific to women and under-represented students. See the EEB website for additional information.
Appendix A: EEB, College and University Policies for Ph.D. and M.S. Students

The following information provides an abridged version of and EEB Department, Rackham Graduate School, College of LS&A and University policies for Ph.D. and M.S. students. An updated list of applicable policies can also be found on the EEB department website and the Rackham website. Please note that policies change from time to time, sometimes in the middle of the academic year. See the Grad Coordinator for policy questions that incorporate the most up-to-date versions.

EEB POLICIES:

EEB POLICY: Definition of “In Good Standing” - EEB considers five separate situations where a student may lose the academic or language proficiency status of “in good standing,” in addition to the current rules and regulations of the Rackham Graduate School. The loss of good standing automatically results in the Department removing the student from our program, and requesting that Rackham remove the student from all active listings. Note that in all situations described below, the student may petition the Graduate Affairs Committee (GAC) for a reconsideration of their change in standing.

1) A student fails to register for classes or notify the department of their progress or status in the program for two consecutive academic semesters. After the first semester of no contact the student will be notified (at their official University address and contact information) that they are in non-compliance with our policy. If the student fails to register for a second semester, or does not respond adequately to correct their status within two semesters, their dissertation or thesis committee will be dissolved and the department will consider the student removed from the program.

2) A student fails to pass their ELI exam within their first year of study. Successful completion of this exam is required to hold a GSI position. The student will typically have three chances to pass the ELI exam—in August just before their matriculation in the Fall term, at the end of their first semester (December), and during their second semester (Winter term). The student may petition the GAC to continue in the program without passing their ELI exam, but Rackham requires two terms as a GSI to complete a Ph.D.; such a petition would require the full support of an advisor.

3) A student is recommended by the faculty to be separated from the program after failing the Department's preliminary examinations. The student may petition the GAC to retake these examinations, but approval of this request requires the full support of an advisor. If approved, the student is again in good standing. The details of what constitutes failure of the preliminary exams are found on pg. 22.

4) A student surpasses the departmental 6-year limit of enrollment in the Ph.D. program, and their dissertation committee is dissolved. The student may petition the GAC to continue or re-form the dissertation committee, but approval of this request requires the full support of an advisor and the constitution of an appropriate committee. If approved, the committee is re-formed and the student is again in good standing.

5) A student is unable to find a suitable major advisor or suitable co-advisors in either the pre-candidate or candidate phase of graduate work. An EEB faculty advisor must consent to mentor a student and guide them through the preliminary examination process prior to candidacy, and after candidacy a dissertation committee must be formed according to Rackham rules to guide the student through completion of the program of study. The current advisor is responsible for notifying the student and the GAC if there is a change in mentoring status. If an appropriate new advisor cannot be found or a new committee formed in a timely manner, the student loses the status of “in good standing.”

Approved 20 April 2009
EEE POLICY: Graduate Student Hosting—Graduate Recruitment Weekends - To compensate graduate students who participate in the hosting of the graduate applicants invited to the EEB recruitment weekend, the department will provide the following reimbursement:

- Reimbursement for one meal for the graduate host and applicant, not to exceed $25 in total for the two individuals. Other people are welcome to join the applicant and host for the meal, however no reimbursement will be provided for additional guests. Original, itemized receipts must be provided to the graduate office to obtain reimbursement (this is University policy).
- Reimbursement for mileage and parking will be provided for anyone driving a personal vehicle to the airport to pick up and deliver applicants. Mileage reimbursement will be provided at the university standard mileage between the central U-M campus and Detroit Metropolitan Airport (27 miles each way), and at the current University rate per mile (currently $0.51 per mile). Original receipts must be provided for parking expenses.
- In addition to the above, a single student host will receive $20 per applicant to cover the cost of any other expenses not expressly defined above, including incidental food, mileage, and parking expenses other than to the airport. This stipend will be processed via the student financial system, and will not require separate receipts.
- Any exception to the above reimbursements, or any additional request for reimbursement, must be approved in advance in order for it to be considered for separate reimbursement.

Initial Policy Approved—2 February 2009

EEE POLICY: Guidelines for Authorship - This policy is adapted from the authorship policy of the Biomedical Graduate Group at the University of Pennsylvania.
http://www.upenn.edu/grad/auth.biology.html

1. Qualifications for authorship - All persons designated as authors should qualify for authorship.
   A. Each author should have participated sufficiently in the work to take public responsibility for content.
   B. Authorship credit should be based only on substantial contributions to the following areas:
      1. conception, design, analysis or interpretation of data
      2. drafting the article or revising it critically for important intellectual content
      3. final approval of the version to be published
   C. Conditions 1 and 3 must always be met in assignment of authorship; condition 2 may sometimes not be appropriate in cases of large collaborations.
   D. Participation solely in the acquisition of funding or the collection of data does not justify authorship.
   E. General supervision of the research group is not sufficient for authorship.
   F. Appropriate credit for the contributions of other individuals to the work described in the publication should be made as an acknowledgement.
   G. Any part of an article that is critical to its main conclusions must be the responsibility of at least one author. If that author is a student, then the faculty mentor shares the responsibility.

2. The order of authors
   A. The first author is that person who contributed most to the project, typically including writing the manuscript.
   B. The sequence of author listing is generally determined by the relative contributions to the work. In the instance that equal credit is due, this should be footnoted by asterisk. It is suggested that authors be listed alphabetically in such a case; a policy you may wish to note on your CV.
   C. Decisions about authors and the order in which they appear should be discussed at the beginning of the project and revisited periodically as the project develops. The order of names should be made by group consensus under the guidance of the lead investigator(s).

3. Corresponding author
   The corresponding author is the person with whom communications should be made after
4. When conflicts arise

Even when the above guidelines are followed, conflicts of opinion may arise. When disagreements cannot be resolved within the research group or in discussion with the thesis committee, the student or faculty member may bring the issue in confidence to the EEB Executive Committee, which will serve as a grievance committee to mediate the conflict. If the chair or a member of the Executive Committee is involved in the conflict, they will be excused from participation in the grievance committee.

Established 15 September 2008

EEB POLICY: Substitution policy regarding Departmental and External Fellowships and GSRAs-

Students cannot receive both a departmental fellowship and an external fellowship or traineeship at the same time. A student cannot receive fellowship/traineeship support and departmental summer support at the same time. External fellowship funding will be supplemented by the department to achieve the guaranteed stipend of $21,800/year if necessary. External fellowships and traineeships are not supplementary, but substitute first, for departmentally-funded fellowships and second, for the GSRA.

Substitutions of support depend upon the term of the fellowship as follows:
1) 3-Year Fellowship: A 3 year fellowship would substitute for the year of departmental fellowship and, unless waived by the advisor, the year of GSRA support. This student would then teach a maximum of 4 terms, perhaps less if the advisor chooses to still support a student as a GSRA.
2) 2-Year Fellowship: A 2 year fellowship would substitute for the year of departmental fellowship and, unless waived by the advisor, the year of GSRA support.
3) 1-Year Fellowship: A 1 year fellowship would substitute for the departmental fellowship and the student would be expected to be supported by a GSRA for one year by their advisor.

EEB POLICY: Additional Funding Policies
- If a student does not use the pre-candidate fellowship, s/he can use it as a candidate fellowship.
- Students must pass all parts of the evaluation in the fall of their second year to receive a departmental fellowship in the next winter semester.
- While on a fellowship, a student cannot accept a > 0.25 appointment as a GSI or GSRA. Students can petition the GAC for exceptions if the appointment will significantly benefit their graduate training or research.
- Students can use a fellowship beyond the ten terms of support as a GSI allowed by LSA.
- GSM (Graduate Student Mentorship) (0.1 appointments) funding is added to the guaranteed yearly stipend (i.e. guaranteed stipend will not be reduced by the GSM amount received).
- Summer teaching: Students who GSI during the spring or summer terms can petition the GAC for summer support but will not automatically receive it.
- Summer support: If a student receives a fellowship to begin the spring/summer term, it will not “replace” summer support permanently, but will defer it (regardless of the actual amount received while on fellowship to date) should summer support be needed when the fellowship ends. Spring or summer tuition will be paid if the student defends during one of these terms within the five years.
- For students who have been granted departmental award money for research expenses, either from endowments or other departmental funds, no funds shall be disbursed or information to access the funds (e.g., a shortcode to charge items against when purchasing) until all prior departmental debt has been paid.
- If the student wishes to access funds prior to debt payment, s/he may petition the GAC.

EEB POLICY: Tuition Funding for Summer Dissertation Defense - For students who defend their PhD dissertation during the spring/summer term in their fifth year or earlier, the Department will fund half of the tuition cost, with the expectation that the advisor, student, or other funding source will fund the other half. Students will receive the guaranteed summer stipend as usual. This option is only available once. If
a student chooses not to defend during the summer term that the tuition is paid, subsequent tuition fees associated with the defense will be the responsibility of the student.

To request summer tuition funding, the student must petition the Graduate Affairs Committee and demonstrate that they have an established defense date. Students should wait to pay tuition until they are certain they will defend that term. Their advisor must also provide a letter (an email is fine) confirming that the student will be able to defend during the term when tuition will be paid.

Established 3 March 2008

EEB POLICY: Teaching - Students are required by the department to teach a minimum of two terms and are allowed by the College of Literature, Science and the Arts (LS&A) to teach a maximum of ten terms. Students can petition LS&A for an additional term but it is not likely this will be granted except in unusual circumstances.

By LS&A rules, teaching undertaken while admitted to EEB Master’s programs counts towards the maximum ten terms allowed. Teaching in spring/summer (half or full term) does not count towards the maximum ten terms.

EEB POLICY: Evaluation Examination Retakes - For students who must retake one or two parts of the evaluation procedure, the retakes will be evaluated by the same standing committee and outside member (advisor) who did the first evaluation. For students who must retake the entire evaluation procedure in the fall term, the evaluation committee should include at least one member from the earlier standing evaluation committee, if possible, in order to provide continuity. The second standing member can be a member from the new standing evaluation committee. The outside member (advisor) is chosen by the student as before.

For any one category of the exam (paper, oral exam, or seminar), if a student receives two unacceptables, or one unacceptable and one marginal (with all acceptables in the other two categories), they will be recommended to have failed this one category and will be required to retake this part of the exam, usually in the next winter term. When re-taking portions of the exam, the student must pass each portion with a minimum of two acceptables. For the entire exam, if a student receives one unacceptable in two of the three categories (seminar, paper, oral exam) and either a second unacceptable or marginal in two of the same categories, they will be recommended to be separated from the program. Exceptions are possible based on in-depth discussions by the faculty. For a retake of a part of the qualifying exam, if a student receives a unanimous pass from the evaluation committee, the GAC will make the final decision and report later to the EEB faculty. If the decision by the evaluation committee is not unanimous or if there are concerns, the recommendation will be presented to the EEB faculty and their recommendation will be reported to the GAC for a final decision. A student cannot use a departmental fellowship the semester following evaluations if the faculty recommends separation from the PhD program.

Established 20 April 2008

EEB POLICY: Time to Completion of Degree - Ph.D. students who have not completed their dissertation after six years in the program will be required to petition the GAC to retain their committee. The petition must make a compelling case that they will complete their dissertation within a reasonable time and they must state a specific time schedule. The petition must be accompanied by a letter of support by their major advisor.

If the petition is not made or is not accepted by the GAC, the dissertation committee will be dissolved. Students will be withdrawn from the EEB graduate program and the Rackham Graduate School. After withdrawal, students will not have access to any University resources. All policies regarding Rackham’s Continuous Enrollment Policy must also be satisfied. For more information, see the Rackham website.

Established June 2005

EEB POLICY: Winter Term Admission for PH.D. Students - EEB will admit students in winter term under unusual circumstances. Given that these students are likely to have very different circumstances and
different backgrounds, we do not feel it advisable to set a rigid policy for their evaluation. Incoming students in the Ph.D. and M.S. programs will meet with their initial advisor and the admissions committee to discuss courses and deficiencies. Ph.D. students will have an additional meeting early in the winter term to determine their schedule for their evaluation prelims. This meeting will be with the student, the major advisor, and the chairs of the admissions committee and the Graduate Affairs Committee. This committee will decide on the evaluation schedule based upon this discussion and the background and experience of the student.

Before they can advance to candidacy, students must obtain 36 hours of credit. Students who enter with a relevant Master's degree receive 18 credit hours. As a result, they participated in fall term evaluation examinations and follow the schedule of that year’s cohort. Students who do not have a relevant Master’s degree could take prelims in the fall term and advance the following Fall term once they have completed the 36 credit hours.

**EEB POLICY: Dual Degrees** - Ph.D. and Master’s students who want to apply for a dual degree with a M.S. degree based on coursework in the EEB department, need to submit the following to the EEB admissions committee: a completed dual degree course election form and a new, one page statement of purpose explaining why they want a dual degree in our EEB department. The applicant must arrange to have other materials (CV or resume, GRE scores, transcripts, and letters of recommendation) forwarded from their main department to the EEB graduate office. Students will be required to have an advisor in EEB to guide them in course selection. Students can contact an advisor directly or choose one in consultation with the admissions committee.

**EXISTING RACKHAM, LSA AND UNIVERITY POLICIES:**

**RACKHAM POLICY: Reinstatement in the Ph.D. Program** - As of Fall 2010, all current and former EEB Ph.D. students will be subject to the Rackham Graduate School's Continuous Enrollment Policy. As such, students seeking reinstatement to the program during the Fall Term 2010, after a period during which they have not been enrolled, are subject to the following Rackham policy:

A former student who has withdrawn or has been discontinued from a PhD program while in good academic standing, or was discontinued for failing to show sufficient progress, may seek reinstatement to the same program. A former student who has been discontinued may apply for admission to another PhD program by completing the regular admissions application. A student returning from an approved leave of absence does not apply for reinstatement, but registers for the next fall or winter term that follows the leave.

The former student must complete an application for reinstatement and provide supporting materials. No fee is charged for this application. A former student on probation when last enrolled in the Graduate School must provide reasons for the lack of academic progress, explain how conditions that produced poor performance have changed, and present specific plans for improvement.

Reinstatement is at the discretion of the faculty admissions committee of the graduate program. Decisions to approve or deny the reinstatement request are based on factors such as the former student’s academic progress at the time of withdrawal as well as his or her readiness to return, the availability of faculty to advise the student, and other considerations such as the availability of funding, space, and research facilities.

If a former student seeking reinstatement was on probationary admission, academic probation, or extended probation, that standing remains in effect if reinstatement is granted, unless the issue is remedied and the graduate program and the Graduate School remove or modify the status. If a student is dismissed or required to withdraw, reinstatement may be granted only by obtaining approval of the graduate program and the Graduate School.

For a former student who was discontinued after achieving candidacy, a graduate program may, at its discretion, ask the Graduate School to reinstate the former student as a candidate or to return him or
her to precandidacy status if, for instance, the state-of-the-art knowledge in the field has changed substantially since the student was last active in the program. A reinstated student who is returned to precandidacy status must meet candidacy requirements again. Terms completed before a reinstated student was discontinued are counted toward the time limits for achieving candidacy and for completing the doctoral degree.

To initiate reinstatement to the EEB Ph.D. program students must do the following:

1) Petition the EEB Graduate Affair’s Committee (GAC) via email with a request to be reinstated to the Ph.D. program, including a description of the current or proposed dissertation committee, a brief rationale supporting the request, and a timeline for completion of the degree requirements. Petitions can be emailed to the Graduate Program Coordinator (janesull@umich.edu) who will forward them to the GAC.

2) Complete Rackham’s application for reinstatement and provide supporting materials. Return all forms to the EEB Graduate Program Coordinator for approval and processing.

3) Complete all required Rackham forms related to reformation or revision of the student’s dissertation committee. Return all forms to the EEB Graduate Program Coordinator for approval and processing.

4) Arrange to have the Chair of the Dissertation Committee submit to the GAC a letter supporting reinstatement, including the rationale for returning to the program and a discussion of how the students’ research or dissertation remains relevant to the current state of the art in the student’s particular field of research and scholarship.

Petitions for reinstatement will be reviewed by the GAC, and if warranted, forwarded to Rackham with a recommendation for reinstatement. If the petition is approved by Rackham, the student is considered reinstated to the program.

New procedures are being developed by Rackham for students seeking reinstatement after the Fall Term 2010 due to the implementation of the continuous enrollment policy. Please contact the Graduate Program Coordinator (janesull@umich.edu) for information on procedures regarding reinstatement after the Fall 2010 term.

RACKHAM POLICY: Continuous Enrollment - The Dean and the Executive Board of the Rackham Graduate School have approved the adoption of a continuous enrollment requirement for Ph.D. students at the University of Michigan, to become effective in the Fall Term 2010. M.S. students are not included in this new policy.

Once admitted to a Ph.D. program, students will register every fall and winter term until their degree is awarded, unless they are taking an official leave of absence. Requirements for registration in the summer will not change. Students will register in spring or summer terms only when they elect courses, take preliminary examinations, or defend their dissertations. For more information, see the Rackham website.

RACKHAM POLICY: Pre-candidate Coursework - A pre-candidate must complete at least 18 credit hours of graded (including the grade of S – Satisfactory) graduate coursework registered as a Rackham student while in residence on the Ann Arbor campus. Courses elected as visit (audit) do not meet this requirement, nor do any doctoral courses (those designated as 990, etc.).

RACKHAM POLICY: Candidacy Course Registration - Ph.D. candidates register in the fall and winter terms for 995, "Dissertation/candidate," which consists of 8 credit hours for a full term or 4 credit hours for a half term. No part-time enrollment is possible. A student who defends in the spring/summer term must register for 8 credit hours of 995 for the spring/summer full term. Candidates who register for a course should seek prior approval from their faculty advisors. Candidates may elect one course per term without paying additional tuition beyond candidacy tuition. This course may be taken for credit or as a visit (audit).
A student who does not elect a course during a term of 995 enrollment may elect two courses in the next term of 995 enrollment; no more than one course may be deferred in this manner (an additional course may not be taken in anticipation of taking none in a future term of 995 enrollment). Candidates who choose to take more courses than those for which they are eligible with candidacy tuition will be assessed additional tuition per credit hour.

RACKHAM POLICY: Time Limit for Completing a Doctoral Degree - Students are expected to complete the degree within five years of achieving candidacy, but no more than seven years from the date of the first enrollment in their Rackham doctoral program. Graduate programs should conduct annual reviews of candidates to assess progress toward completion of the degree. Students who entered their program prior to the fall of 2007 and have not completed their degree within the seven year limit should petition Rackham OARD for an extension of time to degree with a plan for completion. Effective for students entering in the fall of 2007 and later, graduate programs may request an unconditional one-year extension for students deemed to be making satisfactory progress toward the degree, providing a plan and timeline for completion. A program may request an additional one-year extension, but a student who does not complete the degree after two years of extension may be returned to pre-candidacy status and required to meet candidacy requirements again. Rackham will notify graduate programs of students who have not completed their degree within the stipulated period.

RACKHAM POLICY: Leave of Absence - See information on Continuous Enrollment, pg. 51, and the Rackham website. The Department of EEB follows Rackham’s policy regarding leave of absence and continuous enrollment guidelines. In addition, please note that prior to applying for a leave of absence of any sort allowed under the continuous enrollment policy, students must consult with the department Graduate Chair to discuss the student’s plans and define a proposal/timeline for the continuation of study. Rackham requires that department Graduate Chairs approve all leaves of absence, so this conversation is not optional. Please notify the Grad Chair (knowlesl@umich.edu) as soon as possible if you are considering taking a leave of absence.

RACKHAM POLICY: Transfer Students

Entering without a Master’s Degree
Currently, per Rackham, when a student in a Ph.D. program at another university wishes to transfer to a U-M Ph.D. program, no credit hours are transferred in. The student must submit a complete application to the program, have the application reviewed by the departmental admissions committee and receive final approval from the department chair.

If admitted, the student will need to comply with all of the current Rackham rules for advancement to candidacy (this means a certain number of credit hours taken on campus, a certain number of Rackham Fee Totals (RFT), etc.) If the EEB department wishes to acknowledge the preliminary evaluation work done at the first university, it may do so. Alternatively, the department may acknowledge the work, but require that a student undertake part of the evaluation exam process.

Cognate courses: Rackham requires 4 credit hours of cognate credit. A student may use one course taken at the first university to serve as the cognate course, if this course is first approved by the department. This is called a “cognate in spirit” and does not add to the number of credit hours or RFTs.

Degree completion: Among other things, 68 RFTs are required for degree completion.

Entering with a Master’s Degree
If a student in a Ph.D. program at another university and leaves with a relevant Master’s degree (as the student wishes to transfer to a U-M Ph.D. program), then 18 Rackham Fee Totals (RFTs) will count towards candidacy.

Cognate courses: Rackham requires 4 credit hours of cognate credit. A student may use one course taken at the first university to serve as the cognate course, if this course is first approved by the
department. However, this course cannot have been used as credit towards the Master’s degree. (In other words, the student cannot double count the class).

Degree completion: Among other things, 50 RFTs are required for degree completion.

EEB/RACKHAM POLICY: Dual Appointments - It is understood that this policy cannot be too rigid due to the variety of external funding that students are awarded. Teaching is valuable and we hope that this policy will allow us to reach a final decision through negotiations with students.

Fellowships are awarded to students so that they can be relieved of all other duties outside of their dissertation research. Students who are appointed on any fellowship including external fellowships such as NSF and want to accept a GSI, GSRA, or GSSA appointment will need to petition the GAC. Students are required to wait for a final decision from the GAC before accepting the GSI, GSRA, or GSSA appointment.

Students who are appointed on any fellowship and want to accept a .1 GSM appointment can do so without petitioning the GAC.

EEB does have a two term teaching requirement but it is not time specific and deferring a fellowship in order to accept a GSI or GSRA does not require petition but it is up to the students, in consultation with his/her advisor.

UNIVERSITY POLICY: Graduate Student Parental Accommodation - In recognition of the challenges of balancing the demands of graduate study and parenting a new child, this policy aims to improve the environment for student parents. The Graduate Student Parental Accommodation Policy (GSPAP) assists graduate students immediately following the birth or adoption of a young child. The purpose of this policy is to make it possible for a student to maintain registered full time student status, along with all the benefits of such status, while facilitating the return to full participation in courses, research and teaching.

Eligibility: The Parental Accommodation Policy applies to full time, enrolled Rackham graduate students who are in good academic standing, and making satisfactory progress toward completion of their degree. Students must have completed at least one full time semester of their degree program to become eligible for coverage under this policy. The policy covers the situation of students who experience a child birth or the adoption of a child under the age of 6 for whom the student has parental responsibilities. These eligibility requirements cover all three provisions of the GSPAP.

Downloadable forms
- Childbirth accommodation fund request form, Graduate Student Research Assistants
- Graduate student parental accommodation request form
- Childbirth accommodation fund request form, external fellowship recipients
Appendix B: University Lands Available for Field Research

The University of Michigan Biological Station
Features: Consists of approximately 10,000 acres of land including a variety of habitats. Access to state and federal lands is also excellent. An eight week summer session of classes is run as well as a limited-schedule, four week spring term. Facilities are excellent, with a fully equipped lab for both terrestrial and aquatic studies, a newly constructed greenhouse, and year-round housing.

Location: Near the tip of the Lower Peninsula, 6 miles east of Pellston, MI. For more information, see the Biological Station Office in the Chemistry Building, or contact the UMBS Director, Dr. Knute Nadelhoffer, or Associate Director, Karie Slavik. An information booklet is prepared annually. Funding is available for study and research through a variety of sources.

Matthaei Botanical Gardens (including Radrick Forest and Bog)
Features: An extensive greenhouse facility, with exhibits open to the public 10:00 a.m.—4:30 p.m. every day. Two hundred forty acres of land are also open 8:00 a.m. to sunset. Marked trails lead through forest, marsh, and swamp. Also present are a variety of more isolated areas which may be useful for research, including upland and lowland woods, fields, and meadows. Fleming Creek flows through the property. Radrick Forest and Bog are administered by the gardens and are located just to the south of the main gardens area. A complete staff of administrators, horticulturists, gardeners and a caretaker is present.

Location: Just east of Ann Arbor. For details on using the gardens for research contact Dr. Robert Grese at 998-9540. Funds are available for graduate student research. Contact the graduate office for information about these funds. Maps are also available.

E.S. George Reserve
Features: The reserve comprises about two square miles of protected land, including upland forests, fields, swamps, marshes, four permanent ponds, as well as many temporary ponds. Housing is available for both married and unmarried investigators, and a small library, shop and an animal room are present. Unsurfaced roads provide access to most parts of the area.

Location: Near Pinckney, Michigan. For more information, contact Dr. Earl Werner, Associate Director of the ESGR, for details about doing research on the reserve. A map is available. Some funds are available for research on the reserve (see pg. 43.)

Mud Lake Bog
Features: The trail leads first across a field, then descends into an extensive swamp forest. During wet periods the swamp may be flooded. By following blue marks painted on trees, you will arrive at the bog proper, which surrounds Mud Lake. The bog has large floating mats and much poison sumac. Marshes can be found on the west side of the bog.

Location: Near Whitmore Lake, in Washtenaw County. For more information: This property is administered by the Botanical Gardens. Contact Dr. Robert Grese at 998-9540 for research use possibilities.

Newcombe Tract
Features: The tract includes 206 acres. The Huron River and Base Lake border the tract on the northwest and north, respectively. Used primarily for class field trips and exercises, the area offers a diverse sampling of habitats suitable for research. About 30 acres of marsh border Base Lake. Another small lake is nearby. Also present are river bottom forest, upland oak-hickory forest, and fields in various stages of succession.

Location: This property is located 14 miles northwest of Ann Arbor at the intersection of Huron River Drive and Strawberry Lake Road.
Nichols Arboretum
Features: The area includes woods, lawns, and banks of the Huron River. Though probably not useful for most kinds of field research, the “Arb” is popular among ornithologists and those seeking to refresh their knowledge of plants. The property is open from dawn to dusk each day.

Location: The Arboretum is located on Geddes Avenue, about one third of a mile east of the Museums Building. Signs are posted at the entrance.

For more information, contact Dr. Robert Grese at 998-9540.

The Chase S. Osborn Preserve on Sugar Island
Features: Consists of over 300 acres at the southern tip of Sugar Island. Contains mainly second growth hardwood forest including extensive swamps. The shoreline is dominated by white pine. A large lodge with a fully equipped kitchen is available to researchers.

Location: This preserve is located on Sugar Island in Chippewa County in northwest corner of the Upper Peninsula bordering Canada.

For more information: For more information, see the Biological Station Office in the Chemistry Building, or contact the UMBS Director, Dr. Knute Nadelhoffer, or Associate Director Karie Slavik. Funding is available for research.
Appendix C: EEB Course Listings

Many of the courses listed below are taught on an alternating-year basis, so indications of the term the course is taught, i.e.: (Fall Term), may not be accurate for a given year. For EEB courses available on a term-specific basis, visit the LSA Bulletin Course List.

You can also view the course catalogue and the schedule of classes from Wolverine Access. Simply select "U-M Course Catalogue" under the heading "Public." You can view a list of courses offered at the U-M Biological Station, as well as a select list of cognates, on the EEB website.

EEB 401: Interrogating data with models
Primary instructor: Aaron King
Advances in computational power over the last decades have brought more complex statistical procedures within the realm of the possible such that it is now possible to design statistical tests that directly answer the ecological questions we ask. In this course, students will have an opportunity to apply these approaches to questions they themselves find interesting. We will study a number of examples in which we have to (1) refine scientific questions into statistical questions by means of mathematical models and (2) put these models to the test by bringing them into risky contact with data. Course work will consist of readings from several texts and from the primary literature, a number of computer labs, and a project. It is hoped that advanced graduate students will take this opportunity to view their data in new ways through the use of models.

EEB 404: Genetics, Development, and Evolution (Winter Term)
Credits: 3
Cross-listed course: MCDB 404
Primary instructor: Patricia Wittkopp
This course introduces students to the field of evolution and development, with an emphasis on genetics as a unifying force. After reviewing fundamental principles in developmental and evolutionary biology, papers from the primary literature investigating the molecular mechanisms responsible for evolutionary change will be discussed.

The course provides the opportunity to learn about the basic principles and latest discoveries in the burgeoning field of evolutionary developmental biology. This course will also integrate material presented in both EEB and MCDB courses, providing a bridge between disciplines and helping students to develop a more holistic view of biology. Finally, the format of the course explicitly emphasizes the development of critical thinking and written and oral communication skills.

EEB 412: Molecular Ecology (Winter Term)
Credits: 3
Primary instructor: Christopher Dick
Molecular Ecology is an academic discipline that links research in ecology and evolution through the use of DNA markers. This class surveys the most important DNA markers and analytical methods currently used in molecular ecology. Topics include population structure, kinship, parentage, community phylogeny, phylogeography, microbial ecology and species discovery.

This course explores key topics in molecular ecology through lectures, discussion of primary literature and analysis workshops. The topics include population structure, phylogeography, kinship and parentage analyses, species discovery, ancient DNA, microbial ecology and community phylogeny. Students will learn to evaluate the utility and limitations of different DNA markers, and they will be encouraged to evaluate the use of these markers in their own research areas. Students are expected to write a short paper that highlights use of DNA markers or genetic analyses in their own area of interest. Some background knowledge in evolution, genetics and statistics is required.
EEB 420: Plant Evolution (Winter Term)  
Credits: 3  
Primary instructor: Yin-Long Qiu  
This course aims to give students an advanced and updated perspective of plant evolution on the following topics: phylogenetic concepts, a phylogeny of photosynthetic life, evolution of genomes in plants, evolution of development (molecular genetics, biochemistry, and physiology), and evolution of interaction of plants with their abiotic and biotic environment.

EEB 424: Behavioral Ecology and Conservation Biology (Fall Term)  
Credits: 4  
Cross-listed course: ENVIRON 415, NRE 415  
Primary instructor: Bobbi Lowe  
This course will focus on the ways environments shape the behavior and life histories of animals. Because environments pose constraints, behaviors have "better" and "worse" impacts on an organism's survival and reproduction. This course will consider hypothesis in five areas.

EEB 425: Field Skills in Wildlife Behavior (Fall Term)  
Credits: 2  
Cross-listed course: ENVIRON 416, NRE 416  
Primary instructor: Bobbi Lowe  
Students gain field skills in testing behavioral ecological hypotheses. Field work stresses repeatable, quantitative observation, generation of testable hypotheses, graphical and statistical data analysis, and oral and written communication.

EEB 436: Woody Plants: Biology and Identification (Fall Term)  
Credits: 4  
Cross-listed course: ENVIRON 436, NRE 436  
Primary instructor: Christopher Dick, Ines Ibanez  
Ecology, systematic and identification of trees, shrubs, and vines are studied in weekly field trips to diverse Michigan ecosystems—including upland, wetland, and floodplain forests. Lectures focus on glacial landscape history, biogeography, and ecology of Michigan forests.

EEB 440: Biology of Fishes (Fall Term)  
Credits: 3  
Cross-listed course: ENVIRON 422, NRE 422  
Instructor: Kevin Eldon Wehrly  
Lectures cover many aspects of the biology of lower vertebrates known as fishes, including evolution, physiology, functional morphology, phylogeny, bio geography, ecology, and reproduction. The systematic position of fish among vertebrates is discussed and exemplary assemblages exam.

EEB 441: The Biology of Fishes Laboratory (Fall Term)  
Credits: 1  
Cross-listed course: ENVIRON 423, NRE 423  
Instructor: Kevin Eldon Wehrly  
This lab provides an intro to field methods used in fish biology and fisheries, and examines the diversity of the Michigan ichthyofauna and major groups of world fishes.

EEB 442: Biology of Insects  
Primary instructor: L. Lacey Knowles  
Credits: 4-5  
Emphasis on living animals and evolution. Embryology, development, and molting; elementary physiology, ecology, genetics and behavior, and functional external and internal morphology; and geological history.
EEB 445: Biogeography (Winter Term)
Credits: 3
Cross-listed course: GEOSCI 445
Primary instructor: Catherine Badgley
This course covers ecological and evolutionary aspects of geography of populations, communities, and lineages. The course investigates the physical and biological processes shaping geographic patterns of species richness, community structure, and ecosystems over the earth and at regional and local scales, as well as the geographic structure of populations and species. The course assumes that students have a background in ecology and evolutionary biology. Class time will involve lectures and regular discussions. The course explores the limitation of distributions of organisms by barriers, including climate, effects on species formation and extinction, species abundance and richness, dispersal, and vicariance.

EEB 450: Biology of Amphibians and Reptiles (Winter Term)
Credits: 5
Primary instructor: Ronald Nussbaum
Lectures on the evolution, behavior, ecology, and life history of amphibians and reptiles. Laboratory exercises and field trips emphasize identification, life history, adaptations, and field methods.

EEB 451: Biology of Mammals (Winter Term)
Credits: 4
Primary instructor: Phil Myers
Evolution, distribution, ecology, behavior, anatomy, and classification of mammals, with emphasis on North American species.

EEB 459: Systematic Botany (Fall Term)
Credits: 4
Primary instructor: Paul Berry
Principles of systematic botany, including training in the major groups of vascular plants in terms of their morphology, anatomy, cytology, ecology, and reproductive biology, as well as problems within numerical taxonomy, biosystematics, and botanical nomenclature. Laboratory includes plant specimens and visual aids.

EEB 463: Neotropical Plant Families (Winter Term)
Credits: 3
Primary instructor: Robyn Burnham
The course introduces students to generic-level organization of 25 neo-tropical plant families. Families covered are (1) ecologically widespread and abundant in the neo-tropics or (2) of taxonomic or economic significance. Meetings include lectures on comparative morphology, anatomy, and ecological /economic significance of families and their included genera, and a laboratory during which students examine dried specimens. A field trip to Missouri Botanical Garden in Missouri is included.

EEB 468: Biology of Fungi (Fall Term)
Credits: 4
Primary Instructor: Tim James
This course provides an introduction to the fungi through lectures, laboratories, and field trips. We explore fungal biodiversity, ecology, genetics, and the importance of fungi in food and human health. Practical experience, such as isolation and identification of mushrooms, yeasts, and molds is included.

EEB 470: Microbial Diversity (Winter Term)
Credits: 3
Primary instructor: Paul Dunlap
The course describes the biological diversity of prokaryotic microorganisms, members of the Domain Bacteria and Domain Archaea, examining the evolutionary origins of microbial life, the metabolic roles extant prokaryotes carry out in maintaining the biosphere, their physiological adaptations to the environment and to environmental extremes, and modern phylogenetic approaches for their identification
and evolutionary analysis.

**EEB 472: Plant-Animal Interactions** (Winter Term)
Credits: 3
This course covers basic concepts dealing with the ecology of plant-animal interactions and coevolution. Topics include such interactions as behavior, pollination, seed dispersal and predation, and various mutualisms. Readings are from the current literature. Background in ecology and evolution is required. There are lectures and discussion.

**EEB 476: Ecosystem Ecology** (Winter Term)
Credits: 3
Cross-listed course: ENVIRON 476, NRE 476
Primary instructor: George Kling
Instructor: Knute Nadelhoffer
Ecosystem Ecology is a lecture/discussion course that focuses on understanding the physical, chemical, and biological processes regulating the dynamics of terrestrial and aquatic ecosystems. We discuss classic and current topics in ecology that have built our understanding of ecosystem organization and function. The course integrates across disciplines of physiological, microbial, population, and community ecology to understand how and why ecosystems differ in composition, structure, and function, and how ecosystems change over time. Students are expected to have a solid background in biology and ecology. We also expect that students will be able to use general principles of mathematics, physics, chemistry, and biology as tools to understand ecological processes occurring at the ecosystem level. The scope of the course includes examples from terrestrial, marine, and freshwater ecosystems.

**EEB 477: Laboratory in Field Ecology** (Fall Term)
Primary instructor: John Vandermeer & Ivette Perfecto
Credits: 5
This is a field course, emphasizing observation and hypothesis formation in ecology. Students work in small groups on specific topics, which changes from week to week.
Note: This course is not officially cross-listed and cannot be taken as an EEB cognate course.

**EEB 479: The Dynamics of Neotropical Rainforests**
Credits: 2

**EEB 480: Computer-Aided Inferences in Evolution and Ecology** (Winter Term)
Primary instructor: George Estabrook
Teaches methods for formulating hypotheses and for generating predictions from them so that they may be tested with data. These methods will enable you, as a natural scientist, to participate responsibly in the design of your experiments and observations, and in the making of inferences from the data they provide, free of the burden of unwanted mathematical assumptions.

**EEB 483: Limnology: Freshwater Ecology** (Winter Term)
Primary instructor: George Kling
Freshwater ecology is the study of environmental and ecological aspects of inland lakes and streams (also called "Limnology"). Some of the topics covered in this course are: the origin of lakes; the importance of physical and chemical properties; the geochemical cycling of different elements such as carbon, phosphorous, and nitrogen; the ecology of aquatic bacteria, phytoplankton, zooplankton, benthos, macrophytes, and fish; the pollution and eutrophication of lakes; the recent concepts in stream ecology; paleolimnology; food-chain dynamics; energy flow; and experimental investigations using whole lakes.

**EEB 484: Limnology Laboratory** (Winter Term)
Credits: 3
Primary instructor: George Kling
Discussion, laboratory, and field work dealing with interpretation of the interaction of environmental factors in natural waters. Emphasis on comparative aspects of local habitats.

**EEB 485: Population and Community Ecology** (Fall Term)
Credits: 4
Primary instructor: Deborah Goldberg
Principles governing the phenomena of single and interacting populations are examined, from basic tenets to cutting-edge research questions. Population and community-level perspectives are integrated by drawing parallels between approaches and considering how to scale up from the phenomena of one or a few species to the structure and dynamics of whole communities.

**EEB 487: Ecology of Fishes** (Winter Term)
Credits: 3-4
Cross-listed course: ENVIRON 409, NRE 409
Primary instructor: James Diana
The three classes commonly called fishes include more species of vertebrates than all other classes combined. Fishes also have a higher rate of endangerment than all other classes of vertebrates, due to human use of aquatic resources. Ecology of fishes is a course for juniors and seniors that focuses on the dramatic interaction between fishes and their habitats. The course covers: physiological, behavioral, and numerical responses of fishes to biotic and abiotic factors; the relationship between environmental factors and fish energetics, growth, survival, behavior, and reproduction; adaptations of fish for survival under different environmental constraints in major habitat types; and the role of humans in fishery declines and fish conservation. The course can be taken as a stand-alone lecture for 3 credit hours (section 003) or as a lecture and lab for 4 credit hours (section 001). The lab uses field trips and lab experiments to elucidate the relationships between fishes and their habitats. At least five of the lab sections are typically completed on local lakes and streams.

**EEB 489: Soil Ecology** (Fall Term)
Credits: 3
Primary Instructor: Don Zak
Cross-listed course: ENVIRON 430, NRE 430
Soils as central components of terrestrial ecosystems. Major emphasis is placed on physical, chemical, and biological properties and their relationships to plant growth and ecosystem processes. Understanding is developed using a combination of lectures, field- and lab-based exercises, and individual research. Students are expected to have a background in chemistry and biology. In particular, a working knowledge of chemical equilibria, ionic solution chemistry, pH, and oxidation-reduction reactions is highly recommended. Students without such background should consult with the instructor before enrolling. Also useful (although not required) are familiarity with biochemistry, plant physiology, microbiology, geology, and local flora. You will find it very helpful if you have had, or are currently enrolled in, Woody Plants (EEB 436/NRE 437).

**EEB 490: Population and Quantitative Genetics** (Winter Term)
Credits: 3
Primary Instructor: Alex Kondrashov
This course will systematically treat the foundations of population genetics. First, the five factors affecting dynamics of within-population genetic variability will be introduced: mutation, selection, mode of reproduction, population structure, and genetic drift. After this, we will consider interactions of these factors and will discuss applications of formal models to understanding processes in real populations. An inverse problem of inferring parameters of mutation, selection, and drift from the dynamics of a population will be addressed briefly. Finally, we will review quantitative genetics and the issue of evolution of the basic properties of populations, such as mutation rates and modes of reproduction. Evaluation will be based on six assignments and one term paper.

**EEB 492: Behavioral Ecology**
Credits: 3-5
Primary instructor: Elizabeth Tibbetts
This course explores the behavior of animals in their natural environment. Students develop their understanding of evolution and learn how to apply natural selection to understand why animals behave the way they do.

EEB 498: The Ecology of Agroecosystems (Fall Term)
Credits: 3
Primary instructor: John Vandermeer
An analysis of ecological principles as they apply to agricultural ecosystems, emphasizing theoretical aspects but also covering empirical results of critical experiments. While the emphasis is on principles, practical applicability is also explored where appropriate. Physical, biological, and social forces are integrated as necessary. Designed as preparation for active research in agroecosystem ecology.

EEB 512: Molecular Systematics and Evolution (Winter Term)
Credits: 3
Primary instructor: Jianzhi Zhang
This course examines processes and patterns of evolution at the molecular level, as well as methods of phylogenetic analysis using molecular characters, such as amino acid sequences, DNA sequences, and features of genome organization. These evolutionary topics and methods are key components in the developing field of bioinformatics.

EEB 514: Topics in Molecular Evolution
Credits: 3
Advisory prerequisite: Biology 305 and one upper-level course in either molecular or evolutionary biology, and permission of instructor.

EEB 515: Isotope Biogeochemistry
Credits: 3
Advisory prerequisite: Permission of instructor
Cross-listed course: AOSS 535, GEOSCI 514
Instructor: George Kling
This course is an introduction to the application of stable and radiogenic isotopes to biogeochemistry, environmental science, ecology and paleo-ecology. The primary emphasis will be on the applications of light and "non-traditional" stable isotopes, with a smaller emphasis placed on the application of radiogenic isotopes. The course will begin with the theory, nomenclature and methods of isotope analysis. This will be followed by applications of: H and O isotopes in the atmosphere and in paleo-thermometry; C, N and S isotopes in plants, foodwebs, soils and oceans; "non-traditional" isotopes such as Fe, Ca and Hg in the growing range of Earth surface studies; and the application of radiogenic isotopes as fingerprints of contaminant and nutrient sources.

EEB 516: Principles of Evolution (Winter Term)
Credits: 4
Advisory prerequisite: Biology 305.
Primary instructor: L. Lacey Knowles
This course explores various topics in evolutionary biology, with an emphasis on conceptual principles and generalizations. Fundamental principles are discussed in relation to topics of active contemporary research and controversy. It includes lectures and discussion on major principles in population genetics, molecular and phenotypic evolution, speciation, evolutionary developmental biology, phylogenetics, and macroevolution. The course is broadly relevant to many other fields, from conservation biology to genomics. The course is not a replacement for other EEB courses (e.g., population genetics or molecular evolution). There will be readings from Futuyma plus about two papers or other readings per lecture. Grades will be based on one midterm exam and one final exam (during exam week). This course provides a foundation in evolutionary biology for students whose professional activities will require familiarity with this field.
EEB 544: Basic Concepts in Population and Statistical Genetics  (Fall Term)
Credits: 2
Cross listed Course: HumGen 544
Primary Instructors: Julie Ann Douglas & Jun Li
The objective of this course is to introduce the fundamental concepts and methods of population and statistical genetics as they apply to human populations. Topics include the major forces impacting population genetic variation, quantitative genetics, linkage analysis, tests of association, complex or multifactorial traits and diseases, and the role of the environment. Discussion of many of these topics will be based on particular papers from the literature.

EEB 581: Advanced Topics in Community Ecology  (Winter Term)
Credits: 3
Repeatability: May be repeated 2 times.
Primary instructor: Earl Werner
This course provides an in-depth examination of current theory and empirical research in community ecology. Topics include the mechanisms of species interactions, indirect effects, the influence of temporal and spatial heterogeneity, metacommunity ecology, and the consequences of community structure for ecosystem processes. It provides a venue for an in depth exploration of the literature in community ecology, and for critically evaluating theoretical and empirical advances in this area.

EEB 700 and 730: Advanced Study in Biology and Advanced Zoological Studies
Credits: 1 – 8
Consent: With permission of instructor.
Advisory prerequisites: 16 hours in biology, graduate standing and permission of instructor.
Repeatability: May not be repeated for credit.
Incoming graduate students are required to sign up for EEB 700 with the 700 advisor during the 1st week of fall term and EEB 730 in the winter term of the first year. Credits chosen are flexible.

EEB 800: Biology Seminars – VARIOUS TOPICS
Credits: 1
Advisory prerequisite: Graduate standing and permission of instructor.
Repeatability: May be repeated for credit.
Consent: With permission of instructor.
A graduate seminar course providing opportunity to discuss current work and new developments in ecology and evolutionary biology.

EEB 801: Supervised Teaching
Credits: 1-2
Advisory prerequisite: Graduate standing and permission of instructor. Appointment as a GSI in biology.
Consent: With permission of instructor.
Seminars, demonstrations, and orientation for college teaching in biology. Available for all pre-candidate teaching assistants.

EEB 990: Dissertation/Precandidate
Credits: 1 – 8
Advisory prerequisite: Election for dissertation work by doctoral student not yet admitted as a candidate. Graduate standing.
Consent: With permission of instructor.
Grading: Grading basis of ‘S’ or ‘U’.
Repeatability: May be repeated for credit.
Election for dissertation work by doctoral student not yet admitted as a candidate.
EEB 995: Dissertation/Candidate
Credits: 4-8
Course prerequisite: Candidate
Enforced Prerequisites: Graduate School authorization for admission as a doctoral candidate
Grading: Grading basis of 'S' or 'U'.
Repeatability: May be repeated for credit.
Graduate School authorization for admission as a doctoral candidate. N.B. The defense of the dissertation (the final oral examination) must be held under a full term candidacy enrollment period.