SCHOOL OF BIOLOGICAL SCIENCES

GRADUATE STUDENT HANDBOOK

WASHINGTON STATE UNIVERSITY

World Class. Face to Face.

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1.0 INTRODUCTION

The School of Biological Sciences (SBS) at Washington State University (WSU) offers graduate programs leading to the M.S. and Ph.D. degrees. The graduate program of the school is an important part of the research program in plant and animal sciences at WSU. The availability of school and campus facilities and the general atmosphere of the university provide an ideal setting for the dedicated student to obtain a comprehensive training in modern science, as well as mastery of his or her own specialty. The school provides students with opportunities and support to work closely with leaders of their areas, both in laboratory and field settings. This handbook is designed to acquaint students with Graduate School and School of Biological Sciences regulations and procedures required to obtain graduate degrees. Failure to follow these regulations and to observe the degree requirements inevitably results in complications and could delay completion of the degree.

Graduate study is a period of academic growth and professional development. Students are expected to obtain a broad working knowledge of their chosen area. We wish you every success with your graduate program and in your future career.

2.0 NEW STUDENT INFORMATION

2.1 ORIENTATION

The Director of the School of Biological Sciences will have an informal orientation meeting with new students to answer any questions on school regulations. Before or during the first weeks of the new student's first semester, the Graduate Student Advisory Committee (GSAC) will meet with the student to discuss degree requirements including any prerequisites or undergraduate deficiencies, seminar, and special topics course requirements (see Requirements for Degrees).

2.2 OFFICE AND DESKS

The School of Biological Sciences will provide desk space for all graduate students in the school, as long as space is available. Contact the Academic Coordinator in Abelson 312B for your assignment.

2.3 KEYS

The Principal Assistant in Abelson 312A will issue keys. To receive keys you will be required to sign an agreement, which states that you will obey all WSU rules with regard to keys. There is no charge for keys; however, you may be subject to costs of key replacement and rekeying if you loose or fail to return the keys when you leave. Please assume responsibility for locking all office, classroom, and laboratory doors.

2.4 BUILDING PASS

Graduate students are required to have a valid student identification card in their possession during hours when the buildings are closed and to present your card to security personnel upon request. Student ID cards may be obtained from the Cougar Card Center or call 509-335-CARD (2273).

2.5 MAIL

Students will be assigned a mailbox in Abelson 320. Mail sent and received at the University should only be official correspondence. Personal mail should be delivered to private residences, or a mailbox may be rented at the Compton Union Building. Business correspondence can be left in Abelson 312 for mailing. Letters should not be stamped and must have the return address of the school with the +4 zip code (4236).

2.6 TELEPHONES AND FAX

Telephones are available for local calls. Graduate students should work through their advisor for making work-related, long-distance calls. Personal, long-distance telephone calls are prohibited. A staff member in Abelson 312 will send faxes for you. For long-distance faxes, you will need a long-distance access code. Please see the Finance Manager for additional information.

2.7 COMPUTER USE

A computer account with electronic mail and internet access is available through Information Technology (IT) to all graduate student with current enrollment and student ID. Contact the Help Desk at IT for information in setting up accounts and receiving a password. Roving IP addresses are also available through IT for connecting laptop computers to the internet.

Students have access to facilities in the Science Learning Instructional Center (SLIC, Abelson 227). Computers in SLIC are situated in three laboratories and students are free to use these computers when the laboratories are not reserved for classes. A computer is available for graduate student use in Abelson 312. In addition, laptop computers and projectors for presentations, scanners, digital topographical maps for Idaho, Oregon, and Washington, and limited amounts of software are available through the School of Biological Sciences and students should check with faculty or staff concerning the availability of these materials. Additional computers for student use are often available in each faculty member's laboratory.

2.8 PHOTOCOPYING

There are three copiers available for your copying needs. Two of these are in Abelson 304 and one in Abelson 312. You will have a copier code, (usually the first 4 digits of your Social Security #) to be used for your educational endeavors. Copies will be charged (@ $0.25/copy) against the graduate allocation your faculty advisor receives for you. The graduate allocation varies each year so contact your advisor for the current limit. There is a separate copier code for copying related to your TA responsibilities. Please see the Finance Office for the appropriate code.

2.9 SECRETARIAL ASSISTANCE/ ACADEMIC COORDINATOR

Secretarial support is available for teaching-related responsibilities. Requests for assistance with research-related projects should be routed through the faculty research advisor. In addition, the Academic Coordinator is available for assistance with university forms and grant and scholarship applications.

2.10 RESEARCH SUPPLIES

Faculty members usually receive an annual allocation from the school for graduate student research. Check with your advisor on the availability of funds and then contact the finance office to facilitate purchases.

3.0 SCHOOL OF BIOLOGICAL SCIENCES GUIDELINES

3.1 STUDENT APPOINTMENTS

To ensure that all necessary paperwork has been completed, all graduate students should report to the office for the school in Abelson Hall 312 prior to August 16; responsibilities related to assistantships formally begin on this date. Students on teaching assistantships (TA) are assigned teaching responsibilities within the School of Biological Sciences (Biology, Botany, and Zoology). Students receiving a TA, report to Deb Short in Abelson 216. Paychecks are mailed on the tenth and twenty-fifth of the month and cannot be forwarded. To report changes of address, go online to https://webapps.wsu.edu/ais/myinfoservices/eInfoCenterMetro.html#SvcIdx. All TA and RA appointments are for the academic semester (8/16 to 12/31 or 1/1 to 5/15) or the academic year (8/16 to 5/15).

The maximum allowable time on graduate appointments is two years for a Master's student, four years for a Doctoral student who possesses a Master's degree, and six years for a Doctoral student without a Master's degree. Students in a Master's degree program will receive a TAI salary for the academic year (9months) and Doctoral students with a Master's degree will receive a TAII salary for the academic year. Doctoral students without a Master's degree will be paid at the lower rate (TAI) until they advance to a Ph.D. candidate, i.e., after they complete their preliminary examination, and then they will be paid at the higher rate (TAII). In exceptional circumstances, the graduate student's advisor may make a request using the procedures outlined in the SBS policy on extensions to the Associate Director for Graduate Studies and the Graduate Student Advisory Committee (GSAC) for a one-semester extension of appointment as a "Temporary Teaching Assistant". Each case will be evaluated individually considering the student's record and special circumstances of the request. For a full year extension the Associate Director and GSAC will bring its recommendation to the Director of the School of Biological Sciences. Requests for an extension of appointment beyond one year need to be brought by GSAC to the faculty.

Students are also expected to begin the process of establishing residency upon arrival at WSU. For further information on establishing residency go online to http://www.wsu.edu/future-students/admission/residency.html. Failure to promptly establish residency places the non-resident tuition waiver in jeopardy and may subject the student to full non-resident fees.

Graduate students on appointment enter into an agreement with the University that both parties are expected to honor. University policy requires graduate appointees to work 20 hours per week and to be at work each workday, including periods when the University is not in session with the exception of legal holidays (see WSU Holidays http://www.hrs.wsu.edu/general/holiday-03-07.pdf). With satisfactory performance and the availability of funds, the school will continue to provide the student with financial support.

3.2 RESIDENCY

Due to limited numbers of out-of-state tuition waivers, students are expected to establish residency during their first year. Students with at least half-time appointments as research or teaching assistants may qualify for a waiver of out-of-state tuition. Information and the application form is available online at http://www.wsu.edu/future-students/admission/residency.html. The deadline for submission of the questionnaire and documentation is the **30th calendar day** of the semester. However, it is to your advantage to submit your file prior to the beginning of the semester to be considered for a change of residence status by the tuition due date. Allow 3–4 weeks review time. After reading the requirements, students should discuss any questions regarding their residency with the Office of Student Affairs.

3.3 HANDLING CLASSROOM DISTURBANCES

The College of Sciences recommends the following guidelines to teaching assistants on handling classroom disruptions.

Instructors must be prepared to handle the unexpected. One unpleasant task that confronts all instructors at some time is handling the disruptive student. Each instructor has his or her own personal approach to such problems, but a few guidelines are described here in an effort to provide some direction for teaching assistants.

1. Since classroom disruptions come in many sizes and forms, no general policies can be applied to every situation. The cardinal rule, however, is for the instructor to remain as calm as the situation warrants. The instructor should remember that he/she is serving as a University official, and thus has authority supported by the State of Washington Administrative Code.

2. Most disruptions can be handled within class. Most students will not repeat disruptive behavior if it is pointed out to them. The instructor's personal style will determine the approach to be taken in informing the student of the inappropriate behavior and of the admonition to cease and desist.

3. In cases of repeated disruptive behavior that is not so serious as to cause immediate risk to the class, the teaching assistant should inform the course faculty instructor, who should then undertake corrective action.

4. In case of a serious incident that causes physical or verbal intimidation of the instructor or students and that cannot be handled within the classroom, the teaching assistant should leave the room and contact the course faculty instructor for assistance. If the faculty instructor is not available, the director or another faculty member should be immediately notified.

5. In extreme cases of disruptive behavior where the teaching assistant perceives there to be an immediate threat to the safety of persons or to the continuation

of orderly instruction, the teaching assistant may leave the classroom and contact the campus police for assistance.

6. The university simply does not tolerate cheating. Cases of cheating should be immediately documented and taken to the faculty member responsible for the course.

3.4 GRADUATE STUDENT EVALUATIONS

The Graduate School requires an annual review of each graduate student. Near the end of fall semester the thesis advisor will complete the evaluation form (see example evaluation form *3.4.A*) and discuss their evaluation with the student. The GSAC reviews the student's performance, including performance as teaching assistants, for those on TA appointments. Teaching assistants are evaluated by student questionnaires each semester (*3.4.B*). The Associate Director will summarize the teaching evaluations and comments and will make a copy of the summary available to the TA, the instructor of the course, the Scientific Instructional Technician (Deb Short), and the GSAC. If the TA's performance is unsatisfactory, the GSAC will make a recommendation to the Director of the School of Biological Sciences to terminate the appointment. The Associate Director for Graduate Studies will provide comments on the evaluation form and return it to the student for the student's comments and signature. The original is placed in the student's file, and copies will be distributed to the student and thesis advisor. If the student's progress is unsatisfactory, the thesis committee will be consulted to determine whether continuation of graduate student's program is warranted. The Associate Director for Graduate Studies will notify the student in writing of the committee's recommendation and forward a copy of the report to the Graduate School.

3.5 TRAVEL

Authorization for all off-campus travel must be obtained before leaving campus to be eligible for accident insurance or reimbursement of expenses. Graduate students are expected to fill out a travel authorization form (*3.5.A*), and obtain approval from your supervisor and the Director of the School of Biological Sciences before all trips. If travel is to be reimbursed, travel advances can be obtained by submitting a request at least ten working days before the trip. Additional travel information is available online at http://www.wsu.edu/~travel/

Graduate students are encouraged to attend professional meetings. Support is available for travel and includes student-training grants (see scholarships *Section 6.0*), individual and block grant travel programs, and travel support from faculty grants. Application forms for grants may be obtained on line at http://www.gradsch.wsu.edu/travelgrant.htm or from the Graduate School (French 324).

3.6 LEAVE

Students on appointment at WSU do not earn vacation or sick leave. Any absence must be arranged in advance with the RA or TA supervisor as well as the Director of the School of Biological Sciences.

3.7 EXIT

Before departing from WSU, students should return all teaching materials and keys, leave a forwarding address, and consult with the advisor about cleaning up samples, chemicals, etc., from their research. In addition, graduating students will have an exit interview with the Director of the School of Biological Sciences.

3.8 FUTURE EMPLOYMENT

The ability of graduate students to gain employment in their chosen field is of great interest to the faculty. During the course of their training graduate students are strongly encouraged to attend scientific meetings, present and publish their research work, and meet scientists in their field of interest. Students will also become aware of positions in their field through meetings, and announcements in society newsletters, and scientific journals. Information on positions available to M.S. and Ph.D. graduates is posted on second floor of Abelson Hall.

3.9 SAFETY PROGRAM

3.91 Safety Training

Safety training is required of every new graduate student regardless of one's prior training. A safety training session will be presented by permanent members of the Safety Committee in August before the beginning of fall semester. Students arriving at other times of the year will be individually instructed before they begin work. This training will include both general safety and laboratory safety. The safety orientation will be documented on appropriate forms to be signed by the employee. These forms are to be kept in the employee's permanent file.

A graduate student's supervisor will be responsible for furnishing more site-specific information. This will include the following items:

1. location of the Laboratory Safety Manual
2. location of the nearest Material Safety Data Sheets
3. location and use of the chemical spill kit
4. location and update procedure for the chemical inventory
5. location and use of personal protective equipment and other safety equipment
6. lab-specific standard operating procedures

7. lab-specific chemical storage plan
8. lab-specific disposal procedures for sharps, glass, biohazards, chemical waste, and radioisotopes
9. other lab-specific practices

Employees are responsible for conforming to the Washington Industrial Safety and Heath Act regulations, which include: 1) studying and observing all safety practices governing their work; 2) offering safety suggestions contributing to a safer work environment; 3) applying the principles of accident prevention in their daily work and using proper safety devices and protective equipment as required by their employers or employment; and 4) reporting to their immediate supervisor each industrial injury or occupational illness, regardless of the degree of severity.

3.92 Safety Committee

The committee consists of five permanent members and two rotating faculty positions. The faculty will serve two-year terms and act as chair during their second year. The functions of the Safety Committee are:

1. to act as a two-way communication link for safety matters between University administration and the School of Biological Sciences
2. to formulate safety policies for the School of Biological Sciences

3.93 Accident Reporting

Graduate students should promptly report *all* accidents, occupational illnesses, and near misses to their supervisors. The supervisor will fill out a report within 24 hours and have the employee sign it. Accidental Injury, Occupational Illness, Workplace Incident Reports (3.93.A) are available online at http://www.wsu.edu/manuals_forms/HTML/SPPM/S25_Accident_Reporting_and_Follow-Up/S25.00_Contents.htm.

For fire, police, and ambulance emergencies and hazardous material spills--call 911.

For radiation contamination or spill call 335-7383 (Radiation Safety Office).

Teaching assistants are to promptly fill out an Accidental Injury and Occupational Illness Report form to report incidents involving students in teaching laboratories. Report forms are available next to the First Aid Kits in all classroom laboratories.

4.0 SCHOOL OF BIOLOGICAL SCIENCES FACILITIES

4.1 INTRODUCTION

Opportunities at WSU for basic research in the School of Biological Sciences are especially strong in plant and animal physiology, modern structural plant science, ecology and evolutionary biology, systematics, and the health sciences. Each of these disciplines provides many opportunities for careers in academics, agriculture, government, and industry in the U.S. and abroad. Depending upon research interests, faculty and graduate students can pursue investigations in many field research areas, including the northern Rocky Mountains to the east, the Blue Mountains to the south, the Cascade Range to the West, Hawaii, and the grassland communities in the University's immediate vicinity (e.g., Smoot Hill).

4.2 RESEARCH FACILITIES

The School of Biological Sciences is well equipped for many modern research procedures in the life sciences, including cloning, sequencing, and characterization of genes, gel electrophoresis, DNA restriction fragment analysis, *in situ* hybridization, microautoradiography, image analysis, cell culture, isotope ratio by mass spectrometry, and plant gas exchange and fluorescence measurements. The school has excellent growth chamber, greenhouse, and darkroom facilities. In addition, it is closely affiliated with several major University facilities, such as the Marion Ownbey Herbarium, which contains more than 300,000 mounted specimens of vascular plants and cryptogams. The Conner Museum contains more than 60,000 specimens for zoological study. Other major facilities include the Franceschi Microscopy and Imaging Center, which is housed within the same complex of buildings as the School of Biological Sciences. Students interested in field-oriented projects have access to the Smoot Hill Biological Reserve and experimental garden space on Observatory Hill and on Airport Road. Vivarium facilities are available for students whose research will involve the use of live animals. However, it is crucial that protocols for research involving vertebrates be submitted to and approved by the Institutional Animal Care and Use Committee before *any* work is undertaken (this includes both field and laboratory research). Further information may be obtained from the Laboratory Animal Research Center online at http://www.wsu.edu/~larc/. The school is connected through several work stations with the University computing center, which houses an IBM 3090-300E computer with three CPU processors. The Owen Science and Engineering Library, adjacent to the Life Sciences Complex, contains one of the foremost collections of library materials in western North America.

4.3 PLANT GROWTH SPACE

The school has a 4000 sq. ft., 9-compartment Greenhouse on the 7th floor of Abelson Hall and a 2800 sq. ft., 4-compartment Greenhouse at the Steffen Center. Both greenhouses are used for teaching and research. In addition, 23 plant growth chambers

and 4 tissue culture chambers are located in Eastlick Hall (B93, B95, and B97) and one large growth room in Heald Hall (302C). These are used primarily for research. All requests for space must be approved by the student's major advisor and submitted early in the fall semester to the Plant Growth Facilities Manager (Chuck Cody) on the space request form (4.3.A). Space assignments will be made jointly by the Plant Growth Facilities Manager and the Director of the School. Consult the Plant Growth Facilities Manager should your space needs change at any time during the year.

Ultimately, the care of plants in the greenhouses and growth chambers will be the student's responsibility. Routine watering, fertilization and pest control in the greenhouse are performed by the greenhouse staff. Routine watering and fertilization of growth chamber plants are the responsibility of the student. Temperature, photoperiod and ventilation adjustments, fumigation, spray of pesticides, and general care of the greenhouse and growth chambers are the responsibility of greenhouse personnel. Students should not perform any of these jobs, except under direct supervision. Students must be checked out of greenhouse or growth chamber space by the Plant Growth Facilities Manager when their studies are completed. Work areas must be cleaned, pots washed and growing media disposed of as directed by greenhouse personnel. Report immediately any malfunctions or problems to greenhouse personnel. Should problems arise during off-hours, call Chuck Cody at 332-3855. If he is unavailable, call Physical Plant at 335-9000 for immediate assistance.

5.0 REQUIREMENTS FOR DEGREES

5.1 INTRODUCTION

With the assistance of your advisor and by the end of your first fall semester, establish a research advisory committee, develop a course program and begin to develop a research proposal modeled after the federal NSF, USDA, or NIH formats. Normally M.S. students would present this proposal to the research advisory committee during the second semester, and Ph.D. students by the beginning of the third semester. The format, content, and style of the research proposal should be similar to that for a federal agency, and assuring this requirement is the responsibility of the thesis research committee.

5.2 THESIS ADVISOR

The thesis advisor is the graduate student's primary contact concerning all matters related to his or her program of study and thesis research. The advisor assists in selection of the thesis committee, development of a program of study, and thesis research proposal, and is responsible for monitoring the student's academic and professional growth, reviews program changes, and arranges for graduate student support. The student should consult with his or her advisor before registering for courses each semester.

5.2.1 Change of Advisor

Under certain circumstances a student may wish to change graduate advisor during their course of study. If such a change is feasible, the student should discuss this matter with his or her current advisor, the new advisor, and the Associate Director for Graduate Studies.

5.3 MASTERS OR DOCTORAL THESIS RESEARCH COMMITTEE

The major advisor develops the Master's or Doctoral Thesis Research Committee with the student. Normally the major advisor for your degree program would have been identified associated with admittance into the program and the award of a TA or RA, that is, often before your arrival at WSU. The committee consists of faculty in the area of the student's research interest. The committee guides the student's research and helps in developing a program of study, which is to be completed and filed with the Associate Director of Graduate Studies within the first semester of study. For graduate students pursuing a Biology, Botany, or Zoology degree, the program of study must include those courses required to fulfill core curriculum requirements (see core curriculum requirements *Section 5.4.3*) as determined by the GSAC. For graduate students pursuing degrees, the program of study must include courses to correct any deficiencies (e.g., organic chemistry, calculus, 2 semesters physics) as identified by the thesis research committee or GSAC. Meetings of the Masters or Doctoral Committee to assess the

research progress of the student or to have the student provide a verbal or written description of the research program (e.g., before preliminary examination) is left to the discretion of this committee. The committee administers the final examination for M.S. students and the preliminary and final examinations for Ph.D. students.

The minimum number of faculty members on a graduate student's thesis committee for both the M.S. and Ph.D. is three. For the Ph.D. at least three members of the Thesis Research Committee must be members of the graduate faculty. It is expected that the majority of committee members (e.g., 2 of 3, 2 of 4, or 3 of 5 faculty) will be from the School of Biological Sciences.

5.4 PROGRAM OF STUDY

5.4.1 Introduction

All students should become familiar with the Graduate School course requirements as outlined in the *Graduate Study Bulletin* online at http://www.gradsch.wsu.edu/bulletin.htm. Forms for submitting M.S. and Ph.D. programs are available online at http://www.gradsch.wsu.edu/Appfordegrees.html. Milestones for the M.S. and Ph.D programs are outlined in Appendix sections 5.4.1.A and 5.4.1.B, respectively. The student plans the course program in concert with the advisor and thesis committee. It is recommended that the course program be completed by the end of the first semester of study for M.S. students and by the end of the first year of study for Ph.D. students.

A flexible number of credits is allowed for research and thesis each semester. Students, with their advisor's approval, should register for Biol 700 or 800 to bring their credit load to 15-18 credits each semester.

For students pursuing an advanced degree in the School of Biological Sciences, the program of study should include courses to correct any deficiencies in their undergraduate program (e.g., organic chemistry, calculus, 2 semesters physics) as identified by the thesis research committee.

5.4.2 M.S. Programs in the School of Biological Sciences

Botany and Zoology Thesis M.S. Degrees:

Graduate School--minimum of 21 graded credits for the thesis degree program at the 400- and 500-level (see *Graduate School Policies and Procedures* online at http://www.gradsch.wsu.edu/policiesprocedures.html).

School of Biological Sciences--minimum of 9 graded credits from the School of Biological Sciences (Biol) for the thesis degree program in Botany, and Zoology. The program for both degrees must include course work from all 3 areas of the core curriculum within the School of Biological Sciences. As a part of the graded credits from the school M.S. students are expected to take one credit of special topics seminar (e.g., Biol 590) and present a seminar to the school based on the students thesis research (e.g., one credit of Biol 500).

Biology Non-Thesis M.S. Degrees:

Graduate School--minimum of 26 graded credits for the non-thesis degree program at the 400- and 500-level (see *Graduate School Policies and Procedures* online at http://www.gradsch.wsu.edu/policiesprocedures.html).

School of Biological Sciences--minimum of 12 graded credits from the School of Biological Sciences (Biol) for the non-thesis degree program in Biology. The non-thesis degree program in the school is generally reserved for teacher training program. The program must include course work from all 3 areas of the core curriculum within the School of Biological Sciences. As a part of the graded credits from the school non-thesis M.S. students are expected to take one credit of special topics seminar (e.g., Biol 590). Non-thesis M.S. students are exempt from the general requirement to present a seminar to the school.

5.4.3 Ph.D. Programs in the School of Biological Sciences

Graduate School--minimum of 34 credits of 400- and 500-level graded course work for the degree (see *Graduate School Policies and Procedures* online at http://www.gradsch.wsu.edu/policiesprocedures.html). Transfer credits may be accepted from another university (e.g., for students with a M.S.) under Graduate School regulations.

School of Biological Sciences--minimum of 15 graded credits from the School of Biological Sciences (Biol) for the degree program in Botany and Zoology. The program for both degrees must include course work from all 3 areas of the core curriculum within the School of Biological Sciences. As a part of the graded credits from the school, Ph.D. students are expected to take two credits of special topics seminar (e.g., Biol 590), defend orally a research proposal before their thesis committee (Biol 501 2 credits) and present a seminar to the school based on the student's thesis research (e.g., one credit of Biol 500).

5.4.4 Core Curriculum

CORE CURRICULUM REQUIREMENTS FOR A GRADUATE DEGREE

Ecology	Course	Credit
Biol 525	Experimental Plant Ecology	1
Biol 532	Biology of Amphibians and Reptiles	4
Biol 538	Animal Behavior	3
Biol 540	Stable Isotopes	3
Biol 560	Plant Ecophysiology	3
Biol 562	Community Ecology	3
Biol 563	Field Ecology	2
Biol 564	Molecular Ecology and Phylogeography	3

Evolution	Course	Credit
Biol 505	Processes of Organic Evolution	3
Biol 511	Reproductive Biology of Fishes	2
Biol 514	Fish Genetics	2
Biol 519	Introduction to Population Genetics	2
Biol 520	Conservation Genetics	2
Biol 521	Quantitative Genetics	2
Biol 522	Molecular Population Genetics and Evolution	3
Biol 531	Principles of Systematic Biology	3
Biol 533	Modern Methods in Systematics	4
Biol 535	Angiosperm Families of the World	3
Biol 548	Evolutionary Ecology	3
Biol 566	Mathematical Genetics	3
Biol 570	Plant Diversity	3

Physiology	Course	Credit
Biol 504	Experimental Methods in Plant Physiology	3
Biol 506	Microtechnique	4
Biol 509	Plant Anatomy	4
Biol 512	Molecular Mechanisms of Plant Development	3
Biol 513	Plant Metabolism	3
Biol 516	Nutrient Transport and Partitioning in Plants	3
Biol 517	Stress Physiology of Plants	3
Biol 518	Photosynthesis, Photorespiration, & Plant Productivity	3
Biol 534	General & Comparative Neurophysiology	4
Biol 551	Comparative Vertebrate Reproduction	3
Biol 552	Comparative Physiology	3
Biol 555	General & Cellular Physiology	4
Biol 557	Advanced Mammalian Physiology	4
Biol 559	Hormones, Brain and Behavior	3
Biol 561	Environmental Physiology	3

Seminars & Special Topics	Course	Credit
Biol 500	SBS Departmental Seminar	1
Biol 565	Topics in Ecology and Evolution	V
Biol 589	Advanced Topics in Zoology	V
Biol 590	Advanced Topics in Botany	V
Biol 591	Topics in Evolution and Ecology	V
Biol 592	Advanced Topics in Cell Biology	V
Biol 593	Seminar I	V
Biol 594	Advanced Topics on Vertebrate Form and Function	V
Biol 595	Seminar II	V
Biol 597	Teaching Practicum	V
E MIC 586/587	Special Projects in Electron Microscopy	V

5.4.5 Seminars and Attendance

All thesis-option graduate students must present their thesis research in a public seminar and register for Biol 500, usually during the last semester of their degree programs. Support from various fellowships/scholarships/ traineeships should be acknowledged. All graduate students are expected to attend and participate in regular seminars scheduled by the School of Biological Sciences. If time conflicts arise, the student should notify organizing faculty in charge of seminars.

5.4.6 Preparation for College Teaching

The School of Biological Sciences requires that graduate students take Preparation for College Teaching (Univ 590) preferably during their first semester on campus.. Univ 590 is valuable for graduate students who are planning careers that include an instructional role. This 2-credit, 8-week course is provided principally as a service to graduate students. There are no formal course requirements other than attendance. One absence is permitted and videotapes are available to make up missed sessions. Graduate students with formal instructional training may petition GSAC for an exemption from this requirement. Topics covered by multiple instructors include:

The Role of the TA at WSU
The Culture of the American Classroom
Motivating Students to Learn
Policies and Procedures for Dealing with Problem Situations
Racial and Sexual Harassment at WSU: Policies and Procedures
Dialogue with Multicultural Students
Collaborative Teaching and Collaborative Learning
Teaching Techniques for Laboratories and Discussion Sections
Using Writing to Foster Learning
Problem Solving in Lecture Format
Developing and Evaluating Tests of Student Knowledge
Audio-Visual Techniques
An Application of Audio-Visual Techniques in the Classroom
Computing Services at WSU
Library Research Assignments for Undergraduates
Time and Stress Management

5.5 PRELIMINARY EXAMINATION

Key points for the SBS policy on preliminary examinations:

1. There will be two oral examinations. One examination will consist of an oral defense of the student's thesis proposal, and the other examination will be an oral preliminary examination based on the general knowledge of the student. The preliminary examination for candidacy in the Ph.D. program will be formally administered through the Graduate School. While concentrating on the area of interest as defined by the student's research topic, no topic is excluded from oral preliminary. The student must pass both examinations to successfully complete a degree program within the school.

2. A written preliminary exam prior to the oral examination is not a requirement of the School of Biological Sciences, but such an examination may be given if requested by the student or the thesis committee. This is not the proposal defense described above but a general knowledge examination and would be based on questions solicited from the thesis committee.

If a written preliminary examination is required, questions for the written preliminary examination will be solicited from the candidate's Thesis Research Committee. The written preliminary examination will cover the particular area of interest and, like the oral preliminary examination, will emphasize this particular area; however, no area is necessarily excluded.

Preliminary examinations will be scheduled only for graduate students whose programs have been approved by the Graduate School, the Associate Director for Graduate Studies and the thesis research committee, and only after most of the course work is completed. *The Preliminary Examination must be taken no later than the end of the fourth semester for Ph.D. students with an M.S. degree, and no later than the end of the sixth semester for Ph.D. students without an M.S. degree.*

Forms scheduling the preliminary examination may be obtained online http://www.gradsch.wsu.edu/forms.htm or from the Graduate School and should be submitted at least 10 working days before the examination date.

Failure of the examination makes it uncertain whether the candidate is qualified for the Ph.D. If a candidate fails the preliminary examination, the examining committee may decide:

1. that the candidate is not qualified and should not continue for the Ph.D. degree in the School of Biological Sciences at WSU; or
2. that the candidate should retake the preliminary exam. The examination must be taken no earlier than three months after the first preliminary exam and no later than six months after the first exam.

5.6 RESEARCH PROPOSAL

In addition to the oral preliminary examination, Ph.D. students are required to write and defend a research proposal. The research proposal will:

1. follow the format of a large granting agency for competitive grants, e.g., NSF, USDA, or NIH.

2. be developed in conjunction with the thesis research committee; it is the committee's responsibility to approve the proposal and schedule the oral defense of the research proposal.

3. be submitted to the Academic Coordinator for the student's permanent file upon successful completion of the defense; the student will receive graded credit from the thesis research committee.

4. be defended no later than one semester after the general-knowledge oral-preliminary examination; however, it may be scheduled at anytime, including before the oral preliminary examination.

5.7 THESIS

For information on formatting the theses please refer to http://www.gradsch.wsu.edu/forms.htm. All theses must generally adhere to the following guidelines for the reference section as approved by the individual candidate's research committee:

1. The format for each chapter may follow the format for the journal to which the manuscript has been or will be presented (i.e., no consistent format is required between chapters).
2. Full citation for each reference (i.e., including all the authors and the title of the article) must be given throughout the thesis, but otherwise each chapter may follow the format of a particular journal.
3. Use a consistent form of citations throughout the thesis with the student selecting the format of a particular journal that gives the complete citation.

5.8 FINAL ORAL EXAMINATION

Final examinations for M.S. and Ph.D. degrees will follow existing Graduate School regulations (see Graduate School Policies and Procedures http://www.gradsch.wsu.edu/policiesprocedures.html). All graduate students must satisfactorily pass a final oral examination in defense of their thesis research. After preliminary approval of the thesis by the thesis committee, the final examination will be scheduled through the Graduate School. Copies of the thesis must be provided to each member of the thesis committee, thesis advisor, school, and the graduate faculty representative at least two weeks before the oral examination. An abstract must also be placed in Owen Science and Engineering Library. Questions asked during the final examination usually relate to the thesis research but are not limited to the thesis. All faculty may attend the examination and ask questions, but only members of the thesis committee and the graduate faculty may vote. Upon completion of the oral examination, a signed copy of the thesis must be presented to the Graduate School within five working days. Copies of the thesis will also be presented to the school and the thesis advisor.

5.9 TIMING OF DEFENSE FOR M.S. THESES AND PH.D. DISSERTATIONS

Thesis and dissertation defenses will take place during fall and spring semesters of each academic year. Only under unusual circumstances can a defense be held during summer, and only with prior approval of the student's committee early in the preceding spring. Students should not assume that committee members will be able to convene for a defense during summer, and should plan accordingly. Students need to find a day when everyone is available and allow a few weeks for all members of the committee to read and comment on the penultimate draft. Only after each committee member's comments have been received and corrections made to the draft will each committee member be expected to sign the form allowing the defense to be scheduled. Many faculty in the school have research programs that keep them away from campus during summer, and many professional meetings and symposia take place at that time. Consequently, it may be impossible to find sufficient time during summer for the committee to read thoroughly the draft, provide comments, allow sufficient time to incorporate comments into a version suitable for defense, and identify a date for the defense.

5.10 GRADUATION

Students are encouraged to apply for their degree the semester before they plan to graduate and obtain the appropriate packet of information regarding procedures and deadlines for thesis defense and graduation. Failure to meet deadlines could require enrollment for an additional semester.

6.0 FELLOWSHIPS/AWARDS/TRAINEESHIPS

6.1 FELLOWSHIPS/AWARDS/TRAINEESHIPS OPEN TO BOTANY STUDENTS

Through generous contributions from former Botany Faculty and their families, colleagues, students, and friends, several fellowships, awards, and traineeships have been established to support graduate training in botany. These funds provide excellent opportunities for graduate students' professional development.

6.1.1 Aase Fellowship in Botany

Dr. Hannah Aase, Ph.D. University of Chicago, 1914, was a member of the botany faculty at WSU for 35 years from 1914-1949 and was the first Emeritus Professor in the school. She began her career at WSU as she describes it as "instructor in anything whatsoever" which included teaching histology-anatomy and microtechnique. Being widely admired, she was described as a remarkable lady. In a seminar on May 17, 1949, she presented a colorful history of botany at WSU from the very beginning of the university in midwinter of 1892. She continued to read technical journals into her 90's. On the occasion of her 90th birthday one professor wrote, "You were always the eager 'student,' always sharp as a briar, but you had a way of living with your plants, in your garden and your laboratory, that gave you a peace of mind we all envied but were unable to emulate."

The Aase Fellowship, in honor of Professor Hannah Aase, is mainly used for recruitment of new graduate students. This fellowship provides $1,000 each year for two years. Each spring applicants for graduate study in botany are evaluated as potential recipients of Aase Fellowships. The fellowship may be used as a stipend or for any purpose the recipient wishes. After the recruitment process is complete, if additional fellowships are available, the school will consider applications from currently enrolled graduate students. The Academic Coordinator will provide application materials (*6.1.1.A*) for those who are eligible.

6.1.2 Biddulph Summer Research Award in Botany

Dr. Orlin Biddulph, Ph.D., University of Chicago, 1934, was a member of the botany faculty at WSU for 36 years from 1937-1973. He was an internationally known plant physiologist who investigated absorption and translocation of mineral elements, and metabolite and mineral translocation in the phloem. He also established a Molecular Biophysics Laboratory with a unique biological spectrograph for the irradiation of whole plants with monochromatic radiation, and electron spin resonance and nuclear magnetic resonance spectrometers, and chaired a Biophysics Program.

Biddulph Research Awards were established through a generous contribution from the Biddulph family, honoring Professor Biddulph. These $500 awards are given on a competitive basis only to botany graduate students in the School of Biological Sciences who have shown exemplary progress in their dissertation research. The awards

are intended as recognition of that progress and as an aid to further research. The deadline for applications is March. (*6.1.2.A)*

6.1.3 Hardman Native Plant Award in Botany

The Hardman Foundation promotes conservation biology. Research that promotes conservation biology includes projects in systematic botany that contribute to understanding of evolutionary development or regional native plant variation within species or species complexes. Also important are studies of flowering plants considered rare, or that are depleted in range and need study, or require propagation for enrichment of their native range for use in botanical gardens or other suitable preserves. In addition, botanical investigations of geographical, climatological, edaphic and biotic factors that have led to adaptation are important subjects of conservation research.

Hardman Native Plant Awards were established through a gift from the Hardman Foundation to support botany graduate student research in the School of Biological Sciences. In developing the award, the Hardman Foundation recognizes the importance of all botanists who identify with and support conservation biology. Therefore, the award is not restricted to any particular botanical discipline. These $500 awards, given on a competitive basis to all botany graduate students in the School of Biological Sciences, are intended as an aid to further the awardees' research. The deadline for application is December. (*6.1.3.A*)

6.1.4 Betty Higinbotham Trust Award in Botany

Betty Higinbotham was an accomplished botanist and shared Dr. Higinbotham's interest in nature. She was a writer and editor for several national publications and a freelance writer for scientific journals and nature magazines. She graduated from Butler University, receiving a bachelor's degree in botany in 1932 and a Master's degree in 1935.

The Betty W. Higinbotham Trust was established to provide off-campus training and research opportunities for botany graduate students in the School of Biological Sciences. Although priority for awards is given to students wishing to study marine botany at the Friday Harbor Oceanographic Laboratory, applications can also be made for professional travel for graduate student development. The maximum accumulative award to any botany student during the course of their study normally will not exceed $5,000 for M.S. students and $10,000 for Ph.D. students. The deadlines for applications are October and March (*6.1.4.A*).

6.1.5 Noe Higinbotham Award in Botany

Dr. Higinbotham was an internationally recognized plant physiologist as well as devoted teacher and mentor. He was a member of the botany faculty from 1948-1978, and during that time he pioneered investigations into the electrical properties of plant cells, receiving national and international honors for his research and writing. He earned his A.B. degree from Butler University in 1937 and his Ph.D. from Columbia University in 1941.

The Noe Higinbotham endowment was established through generous contributions from Betty Higinbotham and friends, colleagues, and students of Professor Higinbotham to support graduate student research and training in Botany. These $500 scholarships are awarded on a competitive basis to all botany graduate students in the School of Biological Sciences who have shown significant progress in their dissertation research. The awards are intended as recognition of that progress and as an aid to further research. The deadline for applications is March. (*6.1.5.A*)

6.1.6 The Rexford Daubenmire Award in Botany

Dr. Rexford Daubenmire, Ph.D. University Minnesota, 1935, was a member of the botany faculty from 1946-1975. A fund was established beginning in the fall, 1994, in honor of Professor Daubenmire. Support from this fund will be used for graduate student training in botany when an endowment level is achieved. "Dauby", as he was universally known to generations of Botany alumni, was an internationally renowned plant ecologist. During his highly productive career at WSU he supervised more than 35 Ph.D. students and authored three widely used textbooks. His research interests spanned the field of plant ecology from drought and heat tolerance, symbiosis, fire ecology, ecotypic specialization, succession and soil deterioration in consequence of heavy grazing, and vegetation classification to ecologic plant geography. He was also a past president of the Ecological Society of America. Dauby has had a lasting influence on the world-wide stature and reputation of the Department of Botany at WSU and set a high standard for scholarship and research that is continued in the School of Biological Sciences. The deadline for applications is March (*6.1.6.A*).

6.2 FELLOWSHIPS/AWARDS/TRAINEESHIPS OPEN TO ZOOLOGY GRADUATE STUDENTS

6.2.1 The Guy Brislawn Scholarship Award in Zoology

The family of the late Guy Brislawn, a pioneer campus administrator, established the Brislawn Memorial Graduate Scholarship Fund in Zoology with interest in the Life Sciences. The award is given annually to honor graduate students in Zoology who exhibit high academic achievement and exceptional potential for becoming productive scientists and/or teachers. The candidate must be competitive with regards to GPA, publication and presentation history, and similar evidence of scholarship. Prior receipt of

this award will not reduce a candidate's competitiveness for the James R. King fellowship.

6.2.2 The James R. King Fellowship in Zoology

The James R. King Fellowship is a research fellowship to be awarded competitively to an outstanding doctoral candidate in Zoology. This fellowship honors James King, a long-term member of Washington State University's faculty who studied the physiological ecology of birds. The fellowship is intended to support scholarly research. However, the recipient may use as much as three-quarters of the award as salary.

6.2.3 Charles W. and William C. McNeil Award in Zoology

Charles Windslow McNeil was a longtime professor of zoology and a parasitologist at Washington State University. In 1946, Charles accepted a faculty position at WSU and began a long teaching and research career in zoology. Charles spent six months as a visiting scientist in the Department of Parasitology at the Alexandria University in Egypt in 1965-66. In 1964-65 and again in 1968-69, he served as acting chair of the zoology department.

Charles married Edna Wiesner in 1940. Their children are a son, Earle W. McNeil; a daughter Ellen E McNeil; eight grandchildren and six great-grandchildren. A son William C. McNeil, preceded Charles in death. His wife, Edna, established this fund in loving memory of her husband and late son, William.

William C. McNeil earned his Ph.D in history in 1968 . He was a professor of history at Barnard College of Columbia University in New York until his death in 1993. He and his wife Victoria had two children Emily and Nathan.

7.0 GRADUATE STUDENT REPRESENTATION

7.1 SCHOOL OF BIOLOGICAL SCIENCES REPRESENTATION

Graduate students hold several important representative positions within the school. Two graduate representatives serve as a liaison with the faculty and attend all faculty meetings, except those involving personnel matters. Each fall graduate students may elect this representative and notify the Director of their selection. The representative conveys graduate students' concerns or suggestions about the school to the faculty. In turn, the representative is responsible for conveying actions by the faculty to the students. The Director of the School of Biological Sciences will solicit graduate student representatives for these committees.

7.2 UNIVERSITY REPRESENTATION

All graduate students in the university who are currently enrolled in 10 or more hours are members of the Graduate and Professional Student Association (GPSA). GPSA represents the concerns of graduate and professional students both within the university and nationally. The School of Biological Sciences has two representatives to the GPSA Senate (the governing body for GPSA) who are elected each fall. In addition, many of the important advisory committees within the university have voting positions for graduate students. Students are encouraged to become involved in positions of interest. For additional information please consult the GPSA website: http://www.wsu.edu/~gpsa/

7.3 GRIEVANCES

If grievances arise, the student may discuss the problem with the thesis advisor, the Associate Director for Graduate Studies in the school, the Director of the School of Biological Sciences, or as a final resort, the WSU Ombudsman (Wilson 2, telephone 335-1195 http://www.wsu.edu/~ombuds/).