

CLEVELAND STATE UNIVERSITY

DEPARTMENT OF BIOLOGICAL, GEOLOGICAL,
AND ENVIRONMENTAL SCIENCES

GRADUATE PROGRAM HANDBOOK
RULES AND REGULATIONS
FALL 2025

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COLLEGE OF GRADUATE STUDIES

Graduate students are enrolled in the College of Graduate Studies. BGES students must follow all of the Academic Regulations of the College (www.csuohio.edu/gradcollege/) as well as the department (www.csuohio.edu/sciences/dept/biology/BGESweb09/). The *CSU Student Handbook*, produced by the Department of Student Life, also includes information on codes of conduct and grievance procedures (<http://www.csuohio.edu/studentlife/StudentCodeOfConduct.pdf>.) **It is the student's responsibility to understand and follow the rules, regulations and procedures of the Graduate College and the BGES department.** The Graduate Petitions Committee reviews student petitions that seek exception to the rules and regulations of the Graduate College. Note that in some instances the requirements of the Department are more restrictive than those of the Graduate College. The BGES Graduate Committee on Curriculum and Academic Standards (GCCAS) reviews student petitions that seek exception to the rules and regulations of BGES. The same form is used for both (<http://www.csuohio.edu/gradcollege/students/forms/>).

Graduate programs are ultimately administered by the Graduate Faculty, which consists of regular and adjunct faculty members meeting established standards for active scholarship. Most BGES faculty members are members of the CSU Graduate Faculty. Status as a Graduate Faculty member is determined by the Graduate School and is reviewed periodically to ensure all Graduate Faculty are actively publishing and mentoring graduate students. A list of BGES Graduate Faculty is available from the Department and from the Graduate College.

DEPARTMENT

The Department of Biological, Geological, and Environmental Science (BGES, or “the Department”) was created by the 1997 merger of separate Biology and Geology Departments. The Department offers five graduate degrees: a Doctor of Philosophy Degree (Ph.D.) in Regulatory Biology, a Master of Science Degree in Biology that can be either a research thesis (M.S. - Thesis) or non-thesis (M.S. - Non-thesis), and a Master of Science Degree in Environmental Sciences (that can be either a research thesis (M.S. - Thesis) or non-thesis (M.S. - Non-thesis), which is part of Cleveland State University’s interdisciplinary Environmental Academic Studies Program. The doctoral program is sponsored jointly by CSU and by the Lerner Research Institute of The Cleveland Clinic Foundation (CCF). Members of the Department’s Graduate Faculty, drawn primarily from these two institutions, cooperate to offer graduate training covering the broad range of biological sciences. A list of the current Graduate Faculty with a brief description of their research interests is available at the Department’s homepage. New students are encouraged to talk to the individual faculty members whose research programs are of interest to them.

Several individuals and committees oversee the Graduate Program; names and contact information are available on the BGES website. Students are encouraged to contact either the Graduate Program Director, the Environmental Science MS Advisor, or their Major Advisor for answers to questions concerning their graduate education. The list below summarizes the various positions and duties of these individuals and committees:

DEPARTMENT CHAIR – The Department Chair, as the head of the department, is responsible for teaching assignments for faculty and teaching assistants as well as a host of other duties. Talk to the Department Chair if you have a problem or concern that cannot, or will not, be addressed by your Major Advisor, your Advisory Committee, or the Graduate Program Director.

DEPARTMENT OFFICE – The BGES Department Office and the Department’s Administrative Assistant, among other duties, handle contracts with Graduate Assistants.

GRADUATE PROGRAM DIRECTOR - The Graduate Program Director works with the department’s Graduate Committee on Curriculum and Academic Standards (GCCAS) to administer the Graduate Program. After reading everything available online, talk to the Graduate Program Director about finding a Major Advisor, forming your Advisory Committee and any other questions you might have about the Graduate Program. If an advisor cannot be found, the Graduate Program Director will act as the Major Advisor for Non-thesis M.S. students.

The Graduate Program Director handles record keeping for all biology graduate students. As a rule, correspondence concerning graduate study should be directed to this office. Required departmental forms and most Graduate College forms (see Appendix A) can be obtained online.

ENVIRONMENTAL SCIENCE MASTERS ADVISOR – The EVS MS advisor assists the Graduate Program Director with administering the two environmental science master’s programs. New environmental science students can consult with the EVS MS advisor about course selections and potential thesis advisors and non-thesis capstone mentors.

MAJOR ADVISOR – For students conducting research, the primary source for guidance in your graduate career will likely be your Major Advisor. Your Major Advisor will help you form an Advisory Committee, advise you on your Plan of Study and supervise your research program. Pick a Major Advisor whose research interests most closely match your own. This person must be a member of the Graduate College and agree to serve as Advisor. Either you or your Advisor can end the relationship at any time, but switching Advisors usually slows your progress and ends any research assistantship funded through a grant belonging to the Advisor.

CO-ADVISOR(S) – For the purpose of recognizing significant contributions to supervision of their graduate research, students may designate on their thesis or dissertation signature page with the agreement of the faculty members involved one or more of their Advisory Committee Members as Co-Advisors or designate two or more Co-Advisors instead of one Major Advisor. Significant contributions would be interpreted as equal to or exceeding a third of the normal Major Advisor work. It might mean performing large parts of the research in the lab under the supervision of a faculty member other than the Major Advisor; it might be documented by records of such research and supervision and by joint publications. The intention to make such a designation can be conveyed to the GCCAS at any time. For all other purposes—in particular, for the Candidacy Exam and the Approval to Schedule a Defense, the student must designate a single Major Advisor. Minimum number and composition of Advisory, Candidacy Exam, and Defenses Committees do not change.

ADVISORY COMMITTEE – This is the group of three (MS) to six (PhD) graduate faculty members, depending on your degree program and including your Major Advisor, who supervise and approve of your personal graduate program. Student and Advisor should consult to select faculty to ask to serve on the Advisory Committee. Besides the required minimum number of CSU graduate faculty members, additional committee members may be selected from the Department or from other CSU or CCF departments or even from other universities as appropriate to provide advice and support for the student's program of study and research. For doctoral students with a cell/molecular focus, an adjunct faculty from the Cleveland Clinic is required as a member. An external member (a qualified individual approved for voting status by the graduate college who is not formally a part of the degree program) is also required on all doctoral committees. Both internal and external members are chosen

near the end of degree completion. Note, however, that CSU Graduate College Bylaws state that only members of the Graduate College can vote on formal Advisory Committee decisions. The bylaws allow no grace period for faculty members whose Graduate Faculty appointments end.

To change Advisory Committees, submit a new Advisory Committee Agreement signed by new and continuing members. (As a matter of courtesy, notify any members that you are removing from your committee.) If your Advisor or a Committee Member leaves the University, the general rule is that they can continue to be involved in Graduate Faculty activities for the duration of their term of appointment to the Graduate faculty, subject to the approval of the GCCAS. This means that if you, the GCCAS and the faculty member agree, they can continue to serve as a Major Advisor or Committee Member as long as they maintain Graduate Faculty status. This can be renewed even if they are no longer at CSU.

A word of advice and warning: Committee members, like the Major Advisor, serve both as advisors and as examiners: the better informed they are on your progress and on any constraints affecting your study (e.g., visa conditions, financial and job constraints, family issues, deadlines for finishing--expected or unexpected, etc.), the more they will be able to serve as advisors instead of adversaries. Exams will be less frightening and unpredictable if you and your Committee communicate well and major problems are addressed before the exam. Even though Committee members are often very busy, they like to be informed and not discover surprises (i.e., poor experimental design, weak data, visa deadlines, etc.) at exams or defenses. If the Committee knows about external constraints far enough in advance (or at least as soon as you know), it can try to work with you so as to satisfy the requirements of the program and any such personal constraints. Hence, regular meetings with your Advisory Committee are essential to your progress in the graduate program. The Advisory Committee must approve the following:

- Plan of Study (sample p.48)
- Thesis or Dissertation Proposal
- Candidacy exam topic
- Research Completion
- Written Thesis or Dissertation
- Oral Defense of Thesis or Dissertation
- Changes in the Plan of Study
- Petitions to Waive College or Departmental Requirements

It should receive copies of Progress Reports at least once a year.

GRADUATE COMMITTEE ON CURRICULUM AND ACADEMIC STANDARDS (GCCAS)

An elected committee of seven members of the Graduate Faculty from CSU and CCF that monitors each student's progress through the degree program. The GCCAS also reviews the records of students who have not maintained good academic standing or have not met required deadlines as outlined below; it may recommend to the Graduate College that the student be dismissed from the graduate program. Petitions that seek exceptions to regulations of the Department must be approved by the GCCAS. Petitions that seek exceptions to the regulations of the Graduate College are reviewed by the GCCAS, which makes a recommendation to the Graduate Petitions Committee of the College, which then makes the final decision on the petition.

SUBCOMMITTEE ON GRADUATE ASSISTANTSHIPS - The CSU faculty of the GCCAS constitutes a subcommittee that makes recommendations concerning the award of teaching assistantships.

These decisions are based on quality of the application material (GPA, GREs, letters of recommendation, etc.) and past performance as a TA, where applicable, and made in accord with the Graduate College Requirements (see *the Graduate College Graduate Assistantship Policy*).

CELLULAR AND MOLECULAR MEDICINE COORDINATING COMMITTEE (CMMC Committee) - A Committee consisting of the 3 CSU graduate Program Directors from each of the 3 doctoral programs involved (Regulatory Biology, Clinical Chemistry and Biomedical Engineering). This committee functions as a graduate admission and program committee for the Cellular and Molecular Medicine Specialization. This committee has the charge of working with the CMMS director/chair (who also serves as the Director of the Center for Gene Regulation in health and Disease). Duties of the committee include admitting students to the specialization, awarding CMMS research assistantships, and appointing CMMS faculty.

GENERAL REQUIREMENTS AND INFORMATION

Various requirements of the College and Department that apply to all graduate students are summarized in this section.

GRADES

A great deal of information can be found:

<https://catalog.csuohio.edu/content.php?catoid=47&navoid=4017#course-repeat-policy>

Note that research credits taken under BIO 691/695 or EVS 691/695 (M.S.), or BIO 891/895 (Ph.D.) are assigned an S-grade if satisfactory progress is made. If not, a U grade will be assigned and discussions with the appropriate administrators will ensue. Any course below 400-level will not count in the GPA or towards the degree credits. The Department requires that students in the Non-thesis M.S. Programs maintain a cumulative GPA of 3.2. Students in the Thesis M.S. and Ph.D. Programs must maintain a GPA of 3.0. The GCCAS will review the records of students whose GPA falls below the required minimum and make a recommendation to the Graduate College concerning the student's continuation in the Graduate Program. The same review procedure applies to students who receive two grades of B- or one grade of C or below in the course of their graduate studies.

Dismissal from BGES Graduate Programs are normally recommended following the receipt of one grade of F, or two grades of C. The College mandates automatic dismissal of students who receive two F grades and students who accumulate 9 credit hours of grades below B and have a GPA below 3.0. Readmission after a year requires a request to the BGES Graduate Program Director; readmission prior to one year requires a petition to the Graduate College's Petitions Committee. Any readmission will include an admission letter with specific conditions for the further study. After readmission, a single F or two or more grades of B- or less will result in a second dismissal, after which no further graduate study at CSU is possible.

TIME LIMITS TO DEGREE COMPLETION

University policy allows up to ten years for completion of a Masters or PhD degree, subject to program approval. Extensions to this limit must be approved by the Graduate College Petitions Committee, as must any courses used toward the degree that will be more than ten years old at the anticipated graduation date. The Committee currently requires the student to present a compelling case and to outline a schedule to completion; it also requires a discussion and defense of the current relevance of each course older than ten years.

ACADEMIC STANDARDS AND POLICY ON ACADEMIC MISCONDUCT

Graduate students are expected to maintain the highest standards of academic integrity that are essential to the advance of scientific knowledge. Standards and policy are outlined in the *CSU Student Handbook*. Transgressions, such as plagiarism, cheating on examinations, representation of someone

else's work as your own, etc., shall be handled in accord with these published CSU procedures. It is the practice of the department to inform student's Major Advisor when academic integrity violations take place. Plagiarism and other transgressions in connection with an examination are grounds for immediate failure of the examination; in addition, these and other serious instances of academic misconduct may lead to dismissal from the program. Students should obtain copies of the relevant publications and make sure they understand the policies of CSU and the BGES Department. Besides course instructors and general faculty members, people who can help you with questions concerning the policy or what constitutes ethical academic conduct include your Advisor, the Graduate Program Director, the Chair of the Department, and the University Ombudsperson.

ENROLLMENT

FULL-TIME ENROLLMENT - Full-time enrollment for students not holding an assistantship is currently defined by the Graduate College as a minimum of 12 graduate credit hours per term during the academic year and 6 credit hours during the summer term. For students receiving financial aid (e.g., loans), the minimum is 6 credit hours of course work; check with Financial Aid to confirm requirements. For foreign students on a student visa, the minimum is 9 credits; check requirements with International Services. For students receiving a graduate contract, the full-time enrollment is 9 credit hours applicable toward the degree and exactly 9 credits is what the contract will cover. Permission from the Graduate Program Director to exceed 9 may be granted if a course will not be offered again during the expected time frame to graduation for a particular student: this normally means courses at the 500-level and above, but tuition for necessary 400-level courses may be covered with special permission (see contract). The graduate assistantship will not cover any costs incurred for adding and dropping courses. If in doubt about the requirements for full-time enrollment or tuition and stipend payments, check your contract or consult the Department's Graduate Program Director or Chair. Full-time enrollment is not a condition for admission or continuation in the graduate program, but it is required for graduate assistantships and may affect other benefits and entitlements.

ENROLLMENT IN NON-BGES COURSES- Students are expected to enroll only in courses that directly contribute to their program of study within the department. Enrollment in courses outside the department is permitted only with the approval of the student's Major Advisor and Advisory Committee and the Graduate Program Director. In particular, tuition from the department cannot be applied to courses that are outside the department and unrelated to the student's program of study.

CONTINUOUS ENROLLMENT - Students pursuing thesis (M.S.) or dissertation (Ph.D.) options must be continuously enrolled (at least 1 credit hour per term during the academic year, except summer) from the time they complete the Graduate College's *Thesis/Dissertation Proposal Approval* form until their thesis/dissertation is accepted. This is a Graduate College Requirement; any exception to the requirement for continuous enrollment must be approved by the student's Advisory Committee, by the GCCAS, and by the Graduate College.

OVERLOADS - Students wishing to take more than 16 credit hours per term must file a petition with the department's Graduate Program Director. The petition requires the approval of the Major Advisor, the GCCAS and the Graduate College Petitions Committee.

NOTE THAT ALL STUDENTS MUST BE ENROLLED DURING THE TERM IN WHICH THEY DEFEND AND THE TERM IN WHICH THEY TAKE THEIR COMPREHENSIVE OR CANDIDACY EXAMINATIONS. This is a university requirement.

SUMMER ENROLLMENT

Continuing graduate assistants (TA or RA) who are enrolled in Spring and before Summer register for Fall are no longer required to register for 9 credits of summer courses or research in order to receive their graduate assistantship stipend. Neither do international students need to register for summer to maintain their student visa status, unless Summer is their first semester at CSU. Permission to register for credits during the summer must be obtained from the Graduate Program Director and will only be granted if the course will not be offered again during the expected time frame to graduation for a particular student or if research credits are needed to meet a personal and realistic time table for completion. *Graduate Assistants should make sure that the tuition figure on their summer contract corresponds to their actual registration.* Research assistants whose tuition is paid by their Advisor's grant should consult with their Advisor about summer registration.

REGISTRATION

Students will register on-line using CSU CAMPUSNET. If you are not familiar with CampusNet, please see the Department Secretary in the department office for help and instruction. If you need advice on course selection, please contact the Graduate Program Director or your Major Advisor, and EVS MS students may ask the EVS MS Advisor.

In registering, please consider the following:

- Register as soon as possible for all semesters available to ensure your seat as some classes do fill up. Graduate Assistants (TA and RA) must register for 9 credits each Fall and Spring semester that they are on contract. Doctoral Graduate Assistants do not have to register for credits in the summer in order to receive a stipend as long as they do register in May for Fall courses, so do NOT register for credits unless you have permission from the Graduate Program Director. Otherwise we will deregister such credits.
- Register for 695/895 Research only if you have filed a CSU Thesis/Dissertation Research Proposal Approval Form. Otherwise, the Graduate College will deregister you from 695/895, so use 691/891; besides the bother, there may be fees for late adds and possible loss of your GA. (The CSU form should be filed as soon as the general theme and scope of your project is reasonably clear.)
- Other minimum credit requirements apply for continuous enrollment (1 credit), for financial aid (check credits), and for student visas (9 credits each, Spring and Fall); check if in doubt.
- Remember, registering early ensures you get a place in courses with limited enrollment and helps prevent early cancellation of courses with low enrollment.

If your CSU record is not clear and up to date, registration may fail, leading to burdensome paperwork on all sides for late registration, late fees you are responsible for paying, and possible loss of assistantships. This can occur, for example, if the bursar places a flag on your record for unpaid bills, if you move and don't inform the registrar, causing mail to be returned, or if after filing the Application for Graduation Form you delay completion without informing Registrars of the new completion date.

Be sure to inform both the Registrar and the BGES Office if you change addresses or phone numbers.

It is your responsibility to make sure that you are registered for the courses you select and there has been no mistake. Check the CampusNet record after registration and before the first week of class. Save both yourself and us immense amounts of extra work by checking that your registration is accurate before the first day of class. Note that the Registrar imposes a late registration fee if registration is not initiated before the first day of classes. (A request for waiver form from the Registrar's office can be filed, but waiver of the fee is not automatic.)

Further, students can be de-registered for non-payment of fees, fines or tuition. Many students fail to correct the problem and are not reinstated within the two-week limit. (Graduate assistants often assume they can ignore Bursars' tuition bills, but in fact getting such a bill often indicates a mistake has been made and your tuition is not properly covered: don't ignore it.) Beginning Fall 2003, no late reinstatement will be allowed by petition or otherwise after the 11th week of the semester (or the corresponding week of summer) unless the request is based on administrative error. Needless to say, de-registration has major financial consequences for students on assistantships or receiving student loans.

The Graduate College monitors registration. Failure to register and maintain credit minima will lead to cancellation of GA contracts and may lead to a review by the GCCAS. When you register for Fall or Spring, also send an electronic or printed copy of your Progress Report, initialized by your Major Advisor, to the BGES Graduate Program Director.

CHANGING COURSES DURING THE SEMESTER (Do not do this without talking to the Chair of BGES)

Campusnet publishes deadlines for adding and dropping courses using the standard procedure. Note that deadlines for adding courses precede those for various kinds of drops. This means that, although it is possible to do late adds by petition, it may not be a simple matter to add a course or research hours to maintain your course load at the required minimum if you drop a course. This is particularly important for graduate assistants, who risk losing the assistantship if a full course load is not maintained, and for foreign students, who must maintain 8 credits as a requirement for their visa. In any event, there may be fees and prorated tuition charges which you must pay if a course is dropped after the appropriate deadline. Even if you drop before the deadline allowing it not to appear on your transcript, you may still face partial tuition charges. University and College regulations govern all course changes and charges <http://www.csuohio.edu/treasury-services/refunds>. Petition forms and Enrollment Reinstatement Requests are available at the Graduate College website.

UNDERGRADUATE COURSES TAKEN FOR GRADUATE CREDIT

A registered graduate student may use up to 8 semester credit hours of CSU 400-level courses to meet master's degree requirements provided that GCCAS permission is obtained in advance and the courses are not offered by BGES (i.e., no BIO or EVS 400-level courses may be used). Courses below 400-level may not be used to meet graduate degree requirements, but may be taken for remedial purposes.

SEMINARS

Beginning with Fall 05 the weekly Departmental Seminar has been offered as 2-one credit courses that are part of degree requirements (see below). All graduate students are expected to attend Departmental Research Seminars, even if not registered. Attendance is taken and will be considered by the GCCAS when reviewing student progress. Attendance at the thesis /dissertation seminars of fellow graduate students is also expected.

PAPERWORK AND FORMS, INCLUDING PETITIONS

Most of the major steps in any of the degree programs require that a *form* be completed by the student's Major Advisor and/or by Advisory Committee and forwarded by the student to the department's Graduate Program Director. It is the student's responsibility to:

- Obtain any required forms from the website (also given to you during Bio 500/700) PRIOR to any committee meetings at which they are needed.
- Have the form signed by all Committee Members
- Photocopy the form, distribute copies to all Committee Members (if they choose to have one), and (most importantly) keep a personal copy
- Transmit the original to the Graduate Program Director.

Graduate College forms, including the general purpose Petition Form, and Departmental forms are available at previously given respective websites.

PROGRESS REPORTS

At least once per year, students should submit Progress Reports to their Advisor and Advisory Committee. Students who have not yet formed Advisory Committees should file Progress Reports with their Major Advisor or the Graduate Program Director. Failure to be able to document, if requested, progress to degree completion will be considered grounds for a warning and then for the department to NOT initiate the students GA contract.

A Progress Report should include a short text and appropriate tables summarizing work done during the preceding 6 months and the overall progress towards completing the degree. It should list the date of the last committee meeting and formal steps completed (e.g., Committee formation, Ph.D. Candidacy Exam, course requirements passed, any other requirements completed, etc.) and their dates as well as research progress. The Progress Report should also list with complete citations any meeting presentations, publications including abstracts, and research grants obtained during the year.

Unsatisfactory progress will result in a review by the GCCAS and a recommendation for dismissal from the program or loss of any graduate assistantship. For example, the GCCAS recommends that students not having a Major Advisor and Advisory Committee after two semesters in the program be ineligible for graduate assistantships. Besides any student not maintaining the required grades as noted above, doctoral students will be reviewed after the second and third years on the basis of GPA, progress in research, and--for the second year review--completion or scheduling of the Candidacy Exam and--for the third year review--completion of the Candidacy Exam.

RESEARCH PERMITS

Some research projects are subject to approval by CSU or outside agencies. These include any research with human subjects, which must receive prior approval by CSU's Institutional Review Board. In particular, the policy states that "The University as fulfilling any requirements for the degree will accept no research project that required but failed to receive prior Institutional Review Board approval." Studies involving collection of some plants and animals may also require approval. Consult with your Advisor or the CSU Office of Research if in doubt.

COMMITTEE MEETINGS

At least once every year, every student must schedule a meeting of the Advisory Committee to discuss the student's progress in the program and approve the most recent progress report. Whenever committee meetings are scheduled, the student should provide a written memorandum to all committee members reminding them of the date, time and location. The memo should also include an agenda of topics to be considered and be accompanied by any written materials that are to be discussed at the meeting as well as a progress report summarizing the state of progress in research and course requirements. Getting all committee members together at one time is often difficult; it is in the student's interest to use these meetings efficiently by making sure that committee members have time to consider all relevant materials in advance of the meeting. The Committee can advise the student on the specific form they would like the report to take.

Following the meeting, the student should compose and circulate to the Advisory Committee a revised report changed to include any decisions, requirements, or agreements made at the meeting with respect to future course work, research or other degree requirements. This written record is for your own protection. In particular, any decisions about research scope or required experiments should be noted carefully.

SCHEDULING COMMITTEE MEETINGS AND EXAMINATIONS

The BGES seminar room (SRC 255) is typically used for defenses accompanying a seminar and the small seminar room is convenient for committee meetings. However, use of these rooms must be scheduled in advance with BGES department secretary, who, if requested, will also arrange visitor parking for CCF or other non-CSU faculty attending the event. At least 48 hours notice is needed to process the visitor parking requests. Whenever committee meetings or examinations are scheduled, the student should provide a written memorandum to all committee members reminding them of the date, time and location.

CHANGING FROM ONE BGES PROGRAM TO ANOTHER

Switching from one program to another or continuing as a Ph.D. student after completing a M.S. require a CSU Change of Status - Program Transfer Form and a memo to the Graduate Program Director stating your reasons for changing to the new program. In general, credits already obtained towards one biology graduate program can be applied to the new biology graduate program (e.g., 500 and 700 level courses are treated equivalently), but the final decision rests with the Advisory Committee and with the GCCAS.

Requests to switch from M.S. to Ph.D. are subject to additional conditions. First, the request must be accompanied by two letters of recommendation from CSU professors addressing the student's aptitude for doctoral work. Second, such requests will not be considered until a student has completed two semesters or 12 credits of course work at CSU with a GPA of 3.5 or above. Third, students wishing to transfer after the beginning of their third semester must schedule and pass the Ph.D. Candidacy Exam within 2 semesters of their transfer. The Graduate Program Director may request additional supporting documents for applications to switch from a M.S. program to the Ph.D. program.

As a general rule, since even the BGES MS stipend is above the CSU minimum for a doctoral candidate, adjustment of the stipend from the doctoral to the masters level is at the discretion of the BGES Chair for teaching assistants and of the Major Advisor (or PI of grant) for grant-supported research assistants. Adjustments from the masters to the doctoral level will be made as finances permit. Further, it is recommended that graduate assistantships for students transferring from doctoral to non-thesis masters would continue at most to the end of the academic year, and that the stipend be reduced to the masters level if the change includes the entire Spring semester.

IF AN ADVISOR OR COMMITTEE MEMBER LEAVES CSU

According to the Graduate College bylaws, advisors and the required minimum of committee members need to have appointments at CSU. However, in practice, if an advisor, or committee member, moves to another university, they can continue as advisor for the duration of the Graduate Faculty appointment, as long as the Department does not object.

TRANSFER OF CREDITS

As a general rule credit-hours for course work that have been used to earn one degree cannot be used towards a second. However, such course work can be used to satisfy course work requirements (e.g., statistics, biochemistry, electives) in order to replace course work with research or other courses.

In connection with a Plan of Study approved by their Advisory Committee, students may petition the GCCAS to use course work from other graduate degree programs at CSU or elsewhere towards satisfying degree requirements. The petition should make clear whether the student wishes the credit hours to count towards the general course work requirement or merely to satisfy a particular requirement (e.g., statistics or distribution requirements). In any event, the outcome of the petition does not affect the university requirement that a minimum number of hours be done at CSU.

Consult the CSU Graduate College website for University requirements concerning transfer of credits; for example, courses graded S/U may be treated differently than courses with a letter grade. In particular, courses graded C or below are not eligible for CSU transfer of credit. However, such courses may be accepted for waiving BGES course requirements (e.g., statistics or biochemistry) if the Advisory Committee agrees that the student's knowledge in the subject is sufficient for the student's research and career.

CHANGES IN PROGRAM REQUIREMENTS

Degree requirements may change from time to time as the Department and the Graduate College adapt to changing circumstances and strive to improve the program. Every student enrolled in a program affected by such a change can choose to continue under the previously valid rules and requirements or switch to the newly adopted version. If you choose to switch, you should notify the department's Graduate Program Office in writing. As a rule, the choice is exclusive; elements from the

two versions cannot be combined at will. New students must meet the requirements in effect at the time of their enrollment in the program.

FINANCIAL AID, TUITION, AND PAYMENT OF FEES

The Department can offer graduate assistantships (teaching assistants) to only a limited number of students. In addition, some faculty members may be able to support research assistantships connected to their research grants. Department assistantships carry a service requirement of 20 hours per week, respectively) as specified by the Department and the Graduate College. CSU has set limits on the number of years of financial support (6 for PhD and 3 for MS). The department expects that three years of TA support for M.S. students and six years for Ph.D. students will be sufficient for completion (and thus will support petitions for MS students for that third year). Within these limits and assuming the student is making satisfactory progress, the Department will honor to the best of its ability its commitment of graduate assistantships to those students to whom they have been offered. However, students leaving teaching assistantships to assume a research assistantship at the CCF should be aware that the Department is not obligated and, as a rule, will not be able to again provide CSU assistantships should support at the CCF terminate. Details of requirements, obligations, and responsibilities are given in the Graduate Assistantship Policy provided by the Graduate College and in the contracts that you sign with the Department. Academic standards required of students receiving Assistantships may be higher than those for other full-time or part-time students.

Graduate assistantships cover tuition only; they do not cover health insurance, certain small laboratory course fees (technology fees), and some administrative fees, such as those for late changes in registration. You are responsible for paying health insurance premiums, these lab fees and any fees arising from your failure to follow university rules and regulations in a timely manner. You must arrange for payment using funds from your stipend or other sources.

The Department's offer of a Graduate Assistantship in general and a Teaching Assistantship in particular represents a commitment for a full academic year (Fall through Summer semester). Similarly, a student accepting a TA and signing a contract for the Fall shall be considered to have made a similar commitment for a full year and will not be allowed to switch to an R.A. in the Spring if such a switch would adversely affect the Department's total number of TA positions as set by the College or the Department's ability to make TA assignments for all courses to be offered in the Spring.

Ohio law requires that non-native English speakers pass a test of verbal ability (TSE or SPEAK test or the equivalent part of the TOEFL) before serving as a TA in a teaching capacity. The best preparation is to use English every day.

RESEARCH SUPPORT

The Graduate College accepts applications for supplies and travel support for completing dissertation research (Doctoral Dissertation Research Expense Award Program: <http://www.csuohio.edu/offices/spr/quicklinks/funding/pci/sgag/index.html>). The Dissertation Proposal Approval Form must be on file.

CROSS-REGISTRATION FOR COURSES AT REGIONAL PUBLIC INSTITUTIONS

CSU approved a Graduate Cross-Registration Agreement with the University of Akron, Kent State University, and Youngstown State University that allows graduate degree-seeking students to cross register for graduate courses at the member, Northeast Ohio public universities. Copies of the agreement and the standard cross-registration form can be obtained from the Graduate College.

APPLICATION FOR GRADUATION

Students must apply to graduate online in Campusnet one semester before they plan to graduate. If, after submission, you need to delay graduation, inform the Graduation Office of your new target date.

PARTICIPATION IN GRADUATION CEREMONIES

Proper planning for graduation should include submitting the Application for Graduation one semester before the semester you plan to finish, arranging for regalia (the black robe) from the CSU bookstore, and of course making sure all program requirements are completed.

MASTER OF SCIENCE IN BIOLOGY - NON-THESIS OPTION

This degree requires course work, an extensive Library Research Paper based on the primary scientific literature, and its oral defense. Those completing the computational track must take: Bio 531, 532, 533 and either Bio 530 or EVS 524/525. Those completing the cell and molecular biology track must take 15 credits of the following: Bio 604, 610, 624 and 672 (can be repeated with different topic).

MINIMUM COURSE REQUIREMENTS

[number prior to Fall 2000]	
BIO 500 (Orientation I)	1 credit
BIO 504 [501] (Biochemistry)	3 credits
BIO 688 (MS Seminar)***	3 credits
BIO 684 (Research Seminar)	1 credit (2 maximum)
BIO 690 (Qualifying Exam)	1 credit
Additional elective courses:	
400-600 level courses	23 credits (including not more than 7 credits from 400-level, non-BIO or EVS courses*)

32 CREDITS (MINIMUM)

* Graduate College regulations specify that all BIO or EVS courses must be 500-level or above; not more than 7 credit hours of 400-level courses in related areas (not BIO or EVS) may be included if approved in advance by the Advisory Committee and the BGES Graduate Committee.

*** see MS-thesis

In general, electives should be BIO courses, but non-BIO courses appropriate for the student's Plan of Study are acceptable with the approval of the Major Advisor. Students who have never taken a college-level statistics course must take a CSU statistics course: a graduate level course is preferred but courses taken at the undergraduate level (400-level) are acceptable if approved by the Graduate Program Director. Non-thesis students may not use BIO 691/695 or BIO 891/895 (Research) credits toward their degree.

MAJOR ADVISOR

The Graduate Program Director serves as the Major Advisor for non-thesis M.S. students and will work with the student to prepare a Plan of Study, which must be filed with the department's Graduate Program Office.

LIBRARY RESEARCH PAPER

The final comprehensive examination (Bio 690) is based on a Library Research Paper that presents a critical review of original scientific literature on a topic chosen by the student. The choice of topic and the writing are supervised by a faculty member selected by the student. This advisor plus two additional faculty members form an Examining Committee before which the student must defend the Paper in an oral examination. This requirement recognizes that, beyond a student's acquisition of knowledge in formal course work, the ability to read and critically evaluate original scientific literature plays a major role in the work expected of modern professionals with

higher degrees in the sciences. The Library Research Paper is meant to demonstrate this ability for independent work beyond the requirements of individual courses.

The topic should focus on a question of significant current research; it may be chosen from any area of biology. The scope of the paper should correspond to a long term paper; that is, it should include 15 to 30 pages of text plus a bibliography and any necessary figures or tables. The bibliography should include at least 10 recent, original scientific reports plus any relevant background or secondary sources. The paper should identify one or more major questions the research addresses, explain why the question is important (i.e., place it in its broader context), report experimental findings, explain how they relate to the questions raised, evaluate their bearing and significance using any statistical data as appropriate, summarize the results, and discuss the current state of research on the chosen topic.

Early in the course of planning the paper, the student should also select the three prospective members to serve as the Examining Committee. The student should select one of the members to serve as the Chair of the Examining Committee and submit a completed *Non-Thesis M.S. Examining Committee Agreement* to the department's Graduate Program Office.

The completed Library Research Paper must be defended in an Oral Defense conducted by the Examining Committee. The Oral Defense should be scheduled only after the Chair of the Examining Committee has reviewed and approved the final draft of the paper. This draft must be circulated to all members of the Examining Committee at least three weeks before the date of the Oral Defense. The subject of the Oral Defense is the Library Research Paper and related general and background knowledge. All Department faculty members may attend and participate in the Oral Defense; in order that they can be notified, the student must inform the department's Graduate Program Office of the time and place of the Oral Defense at least one week in advance.

NOTE -STUDENTS MUST ENROLL ONCE FOR 1 CREDIT OF BIO 690 (QUALIFYING EXAMINATION) FOR THE ORAL DEFENSE: THIS CREDIT DOES COUNT TOWARDS THE REQUIRED NUMBER OF TOTAL CREDITS.

The result of the Oral Defense is determined by majority vote; the only possible outcomes are PASS (satisfactory) or REPEAT (unsatisfactory). The Chair of the Examining Committee will prepare a brief written report outlining the result and submit it to the Graduate Program Office. In the case of a REPEAT, the report will include any requirements imposed by the Examining Committee for the next examination. This report will be distributed to the student, the Examining Committee members, and the Graduate Program Office within one week of the examination. The exam may be repeated a maximum of two times, with no more than two terms intervening between repetitions. Failure to pass within three attempts shall result in dismissal from the program.

DEGREE COMPLETION

After the student has satisfied all the degree requirements, the department's Graduate Program Office will send a *Notice of Completion for Graduate Degree Requirements* to the Graduate College. After final approval by the Graduate College, the Graduation Office will order a Diploma and complete the arrangements for the student's graduation.

M.S. (NON-THESIS OPTION) DEADLINES

The following chart gives deadlines according to credit hours completed that are recommended for timely completion of the M.S. degree (non-thesis option) and those that are required in order to re-

main in good standing within the program. The GCCAS will evaluate the progress of all students who have not met the required deadlines.

Action	Recommended	Required
Plan of Study	16	24
Select topic and Examining Committee for Library Research Report	25	32

CHECKLIST (MASTER'S DEGREE - NON-THESIS OPTION)

- Meet with the Graduate Program Director to develop a Plan of Study
- Submit Plan of Study to the department's Graduate Program Office (prior to completion of 24 credits of graduate work)
- Select topic for Library Research Paper (one semester before the semester you plan to finish) and arrange for Examining Committee
- Apply for Graduation (one semester before the semester you plan to finish, e.g., Fall if you plan to finish in Spring: See *Graduate Bulletin/Graduate Student Procedures Manual*)
- Complete course work with GPA of 3.2 or above
- Complete Library Research Paper
- Schedule and complete Oral Defense of Library Research Paper before Examining Committee, which files the *MS Non-Thesis Examination Form*
- The Department submits a *Notice of Completion for Masters Degree Requirements*
- For assessment purposes, complete the Department's Exit Survey and Survey of Techniques

MASTER OF SCIENCE IN BIOLOGY - THESIS OPTION

This degree requires course work, original scientific research, a written thesis and its oral defense, a public seminar presentation of the thesis research, and a manuscript suitable for publication as an original research report in a scientific journal. Those completing the computational track must take: Bio 531, 532, 533 and either Bio 530 or EVS 524/525. Those completing the cell and molecular biology track must take 15 cr. of the following: Bio 604, 610, 624 and 672 (can be repeated with different topic).

MINIMUM COURSE AND SEMINAR REQUIREMENTS

[number prior to Fall 2000]	
BIO 500/502 (Orientation I & II)	2 credits
BIO 504 [501] (Biochemistry)	3 credits
BIO 688*** (MS Seminar)	3 credits
BIO 684 (Research Seminar)	1 credit (2 maximum)
Additional (BIO) elective courses:	
400-600 level courses	14 credits (minimum, with not more than 7 credits from 400-level, non-BIO or EVS courses*)
BIO 691/695 – Research**	8 credits (minimum) 2-3 years of actual research

32 CREDITS (MINIMUM)

* Graduate College regulations specify that all BIO or EVS courses must be 500-level or above; not more than 7 credit hours of 400-level courses in related areas (not BIO or EVS) may be included if approved in advance by the Advisory Committee and the BGES Graduate Committee.

** Graduate College regulations specify that you register for Bio 691 until you submit the CSU Dissertation/Thesis Proposal Approval Form and then you register for Bio 695.

*** If the research focus is ecological and if it can be documented that insufficient EEEVS Bio 688 options were available during the duration of a student's graduate enrollment, additional EEEVS Bio 684 courses may be utilized in place of Bio 688. If insufficient EEEVS Bio 684 courses are offered during the duration of a student's graduate enrollment, then other Bio/EVS graduate credits may be utilized.

In general, electives should be BIO or EVS courses, but courses from other departments appropriate for the student's Plan of Study are acceptable with the approval of the student's Advisory Committee. Students who have never taken a college-level statistics course must take a CSU statistics course; a graduate level course is preferred but courses taken at the undergraduate level (400-level) are acceptable if approved by the Graduate Program Director. A list of acceptable undergraduate courses is available from the Graduate Program Office.

MAJOR ADVISOR AND ADVISORY COMMITTEE

Initially, the graduate program advisor will serve as the student's advisor. As soon as possible but no later than the completion of 9 hours of graduate work, students should approach a departmental graduate faculty member whose research area matches their own interests and who can provide any necessary laboratory space and research support. Together, the student and Major Advisor should discuss possible research projects and laboratory availability. Note that faculty need to be willing and able to have a student join their laboratory. This may not always be possible, particularly given time and monetary constraints. After reaching an agreement with a suitable Major Advisor,

students must complete the *Major Advisor Agreement* and submit to the department's Graduate Program Office.

A minimum of two additional faculty members from the Graduate Faculty of the Department must be selected by the student and Major Advisor to serve, along with the Major Advisor, as the Advisory Committee. Students must complete an *Advisory Committee Agreement* form which must be submitted to the department's Graduate Program Office.

PLAN OF STUDY

Prior to completion of 18 credit hours of graduate work the student should prepare a *Plan of Study* listing the minimum course requirements for the degree, the courses taken and proposed towards fulfilling the requirements, and a schedule for completing the degree requirements. The *Plan of Study* should clearly identify the courses intended to meet the different requirements as well as outlining the schedule of courses to be taken in future semesters. A sample is included as Appendix B; other examples can be examined in the department's Graduate Program Office.

Students should include in their *Plan of Study* any proposed transfer credits and requests to waive Department and/or Graduate College requirements. (Requests to waive Graduate College requirements must also be submitted on a Graduate College *Petition Form*, which is reviewed by the GCCAS. The GCCAS includes its recommendation on the petition and then it is forwarded to the Graduate College Petitions Committee for approval or disapproval.)

After the *Plan of Study* is completed, the student should schedule an Advisory Committee meeting to discuss the *Plan of Study* as well as any waivers requested. The student should obtain from the department's Graduate Program Office a *Plan of Study Certification* form for completion at the meeting. If the *Plan of Study* is approved, the student should have the form signed by the Advisory Committee. If revisions to the *Plan of Study* are required, the student may obtain approvals and signatures of members individually after revisions are complete. The original *Plan of Study Certification* together with a copy of the *Plan of Study* itself should be forwarded to the department's Graduate Program Office.

RESEARCH PROPOSAL

A brief research proposal should be written by the student in consultation with the Major Advisor. This proposal must be provided to all Advisory Committee members prior to a committee meeting to discuss and approve it. A completed *CSU Thesis or Dissertation Proposal Approval Form* together with a copy of the Research Proposal should be returned to the department's Graduate Program Office; each Advisory Committee member should sign or, if their names are already entered, initial the form.

PROGRESS REPORTS AND COMMITTEE MEETINGS

Students must meet with their Advisory Committee, either collectively or individually, at least once a year. Failure to be able to document, if requested, progress to degree completion will be considered grounds for a warning and then for the department to NOT initiate the students GA contract.

Unsatisfactory progress may result in a review by the GCCAS and a recommendation for dismissal from the program.

RESEARCH COMPLETION, WRITTEN THESIS, AND ORAL DEFENSE

Completion of the M.S.-Thesis degree requires a written thesis (numerous examples are available in the department's Graduate Program Office) approved by the Advisory Committee, a Departmental Seminar presentation of the thesis research, and an Oral Defense of the Thesis.

One term prior to the anticipated graduation, the student must schedule an Advisory Committee meeting to determine whether the accomplished research is complete and sufficient, in principle, for attaining the degree. Agreement should be documented by submitting a completed *Research Completion Certification* to the department's Graduate Program Office. The *Application for a Master's and Doctoral Degree* should be filed at this time.

The written thesis should be drafted in conformity with the *Thesis and Dissertation Format Guidelines* as required by the Graduate College. In addition, style and form should follow those outlined in *The Council of Biology Editors Style Manual*. The thesis draft to serve as the basis for the defense must include all tables and figures as well as the reference list. The student must first have the Major Advisor approve the draft and fill out an *Approval to Schedule Thesis and Dissertation Defense* form, which must be returned to the Graduate Program Office. Then the student should consult with the members of the Advisory Committee and the Department Administrator in order to schedule dates and rooms for the Department Seminar and Oral Defense. Typically the oral defense takes place immediately following the Departmental Seminar; both must take place while a semester is in session.

The student must submit the final draft of the thesis to each member of the Advisory Committee at least two weeks prior to the anticipated thesis defense. At this time, a copy of the abstract of the thesis together with the title, place, and time for the seminar must be provided to the department's Graduate Program Office for distribution to all faculty and students.

One week before the defense, a draft of the thesis must be placed in the BGES Office by arrangement with the Graduate Program Director.

At the Department Seminar, the student presents the results of the thesis research project to the faculty and students of the Department. All persons attending the Seminar may ask questions.

The Oral Defense is conducted by the student's Major Advisor and Advisory Committee, although all faculty members may attend and ask questions. At the Oral Defense, the student and faculty engage in a detailed discussion and critique of the thesis, offering the student the opportunity to demonstrate competence in his or her research field. Advisory Committee members are required to attend both the Departmental Seminar and the Oral Defense.

The outcome of the Oral Defense is determined by majority vote of the Advisory Committee. The possible outcomes of the examination are APPROVAL, CONDITIONAL APPROVAL or DISAPPROVAL. The result is noted on the *M.S. Thesis Seminar and Defense Form*. In addition, the Major Advisor shall prepare a brief written report outlining the result of the examination. In the case of a CONDITIONAL APPROVAL, the report will include the conditions to be satisfied before final approval is granted; the Committee signifies that these conditions have been met when it signs the final version of the thesis. In the case of DISAPPROVAL on the first attempt, the report will include any requirements imposed by the Committee for the next examination. Conditions and requirements may include repetition of the Departmental Seminar. This report will be distributed to the student, the Advisory Committee and the GCCAS within one week of the Oral Defense. The Oral Defense may be repeated once, with no more than two terms intervening between repetitions. Failure to pass (an outcome of disapproval) in two attempts shall result in a recommendation for dismissal from the M.S. program.

The final version of the thesis, which must incorporate any and all changes mandated at the Oral Defense and conform to the *Thesis and Dissertation Format Guidelines* as required by the Graduate College, must be approved by the Advisory Committee. This final version of the Thesis must be presented to the department's Graduate Program Office and to the Graduate College for approval. All instructions from the graduate college must be followed.

MANUSCRIPT/REPRINT OF AN ORIGINAL RESEARCH REPORT

Besides the final version of the thesis, the required article or manuscript of an article in a format suitable for publication must be presented to the department's Graduate Program Office for final approval by the Graduate Program Director. Students who have published some or all of their thesis research may substitute a reprint for the required manuscript. Multi-author papers are acceptable in areas where this is common practice if the student's work comprises a significant portion of the reported work and the student plays a major role in composing the report. The manuscript or reprint must be approved and initialed by the Major Advisor.

DEGREE COMPLETION

After the student has satisfied all the degree requirements, the department's Graduate Program Office will send a *Notice of Completion for Masters Degree Requirements* to the Graduate College.

M.S. (THESIS OPTION) DEADLINES

The following chart gives deadlines according to credit hours completed that are recommended for timely completion of the M.S. degree (thesis option) and those that are required in order to remain in good standing within the program.

Action	Recommended	Required
Select Advisor	9	20
Plan of Study	18	24
Research Proposal	18	30*

* Students with a heavy teaching commitment may exceed this limit by one semester or 9 credit hours.

CHECKLIST (MASTER'S DEGREE – THESIS OPTION)

- Major Advisor - Obtain and complete the *Major Advisor Agreement* form.
- Advisory Committee – Together with your Major Advisor, select appropriate faculty members for the committee. Obtain the *Advisory Committee Agreement* form, and submit the completed original to the department's Graduate Program Office.
- Plan of Study - Prepare a Plan of Study with your Major Advisor. Obtain and complete the *Plan of Study Certification* form and submit the original, together with a copy of your *Plan of Study*, to department's Graduate Program Office.
- Research Proposal - Prepare a Research Proposal and distribute it to your Advisory Committee. Obtain and complete the *Thesis or Dissertation Proposal Approval Form*. Submit the completed form, together with a copy of your *Research Proposal*, to the department's Graduate Program Office.

- Research Completion - Obtain the *Certification of Research Completion* form and schedule an Advisory Committee meeting the term PRIOR to the one in which you anticipate completing your degree requirements. Submit the completed form to the department's Graduate Program Office. Submit the *Application for a Master's and Doctoral Degree*, if this has not already been done.
- Schedule Thesis Seminar and Oral Defense – Both must be held during the academic term; typically the Oral Defense takes place immediately following the Thesis Seminar. Before scheduling dates, you must have your Major Advisor approve a draft of your thesis and you must submit an *Approval to Schedule Thesis and Dissertation Defense* form.
- Written Thesis - A draft of your thesis, APPROVED BY YOUR MAJOR ADVISOR, must be submitted to Advisory Committee Members at least two weeks prior to your defense. Submit seminar title, date, and place along with a copy of the thesis abstract to the department's Graduate Program Office.
- Submit a thesis copy to the Graduate Program Office at least one week prior to your defense.
- Complete Thesis Seminar and Oral Defense. File *M.S. Thesis Seminar and Defense Form*. Revise the thesis as required.
- Thesis Format Approval - A copy of your Thesis that has been approved by your Advisory Committee should be shown to the Graduate College and to the BGES Graduate Program Director for approval of its style and format (i.e., margins, table of contents, figures, etc.) This should be done PRIOR to photocopying. (See the Graduate College Format guide and the guidelines from the Department.)
- Final Copy of Thesis - Copies of your approved thesis must be submitted to the department's Graduate Program Office. An electronic version must be submitted to OhioLINK ETD Center.
- A reprint or copy of a published report or a manuscript based on your thesis in a format suitable for publication that has been approved and initialed by your Major Advisor, must be delivered to the department's Graduate Program Office.
- When all requirements are completed--typically when the final version of the thesis is ready--the Graduate Program Director and Chair will fill out a *Notice of Completion*. One part of this form should accompany the three thesis copies taken to the library for binding.
- For assessment purposes, complete the Department's Exit Survey and Survey of Techniques

MASTER OF SCIENCE IN ENVIRONMENTAL SCIENCE - THESIS OPTION

The Master of Science in Environmental Science prepares students for a wide range of professional careers that require knowledge of biology, chemistry, or earth sciences in order to address environmental issues. The basic structure of the degree program is similar to the thesis option of the Master of Biology; it requires course work, original scientific research, a written thesis and its oral defense, a public seminar presentation of the thesis research, and a manuscript suitable for publication as an original research report in a scientific journal. The differences relate to course work and to the broader, interdisciplinary focus of the program. Those completing the computational track must take: Bio 531, 532, 533 and EVS 524/525.

MINIMUM COURSE AND SEMINAR REQUIREMENTS

BIO 500 (Orientation)	1 credit
BIO 684 (Research Seminar, EEVVS section)	1 credit
Quantitative Data Methods*	3 credits
Environmental Technologies*	3 credits
Environmental Law, Policy and Planning *	3 credits
Environmental Field and Laboratory Experience *	2 credits
Elective Courses *	9 credits
EVS 691/695 – Research **	10 credits (min) 2-3 years of actual research
32 CREDITS (MINIMUM)	

* See Appendix D for a list of approved courses in each category

Note that the Graduate College regulations specify that all BIO and EVS courses must be 500-level or above; not more than 7 credit hours of 400-level courses in related areas (not BIO or EVS) may be included if approved in advance by the Advisory Committee and the BGES Graduate Committee.

** Graduate College regulations specify that students register for EVS 691 until you submit the CSU Dissertation/Thesis Proposal Approval Form, and then students register for EVS 695.

The EVS MS Coursework is designed to provide strong foundational knowledge in environmental science, as well as strengthen interdisciplinary skills. The Research Seminar (BIO 684) is a course presenting research specific to the environmental science, ecology and evolution to broaden students' perspectives on current research in environmental sciences. A set of core competencies in Quantitative Data Methods, Environmental Technologies, and Environmental Law/Policy/Planning are required. This is in keeping with the overall goals of the environmentally-focused graduate programs to introduce students to areas outside their major area of study to build the skills necessary for an interdisciplinary approach.

The remaining required coursework provides considerable flexibility, allowing students to focus in areas related to their interests. The Major Advisor and Advisory Committee will ensure that a program of study is consistent with the student's academic background and appropriate to individual requirements. Additional elective courses should be selected with the approval of the student's Advisory Committee as appropriate to the student's Plan of Study and the broader area of environmental studies; approved courses are listed in Appendix D. In general, electives should be approved EVS or BIO courses, but non-BGES courses appropriate for the student's Plan of Study are acceptable with the approval of the Advisory Committee. Courses to meet the environmental field experience requirement must provide substantial and rigorous experience in field methods in biology, geology or environmental sciences and similarly should be discussed with the Advisory Committee.

MAJOR ADVISOR

Initially, the EVS MS advisor will serve as the student's advisor. As soon as possible but no later than the completion of 9 hours of graduate work, students should approach a departmental graduate faculty member whose research area matches their own interests and who can provide any necessary laboratory space and research support. Together, the student and Major Advisor should discuss possible research projects and laboratory availability. Note that faculty need to be willing and able to have a student join their laboratory. This may not always be possible, particularly given time and monetary constraints. After reaching an agreement with a suitable Major Advisor, students must complete the *Major Advisor Agreement* and submit to the department's Graduate Program Office.

ADVISORY COMMITTEE

To promote an interdisciplinary approach to the student's research and training, the Advisory Committee may include a Graduate Faculty member from another CSU Department in addition to no fewer than two BGES Graduate Faculty including the Major Advisor. *Ex-officio* members from outside the University may serve on the Committee in addition to the three required faculty members.

COMPLETION OF DEGREE REQUIREMENTS

Apart from the focus of course work and the committee composition described above, the formal degree requirements are like those for the M.S. Thesis Option in Biology. The student must compose a Plan of Study and a Research Proposal, complete original research, and submit a written Thesis for defense, defend the Thesis in an Oral Defense, and finally submit a corrected Thesis approved by the committee. It is expected that the Thesis will present research publishable in scientific journals. For details, refer to the previous sections on the M.S. Biology Thesis Option degree program.

MASTER OF SCIENCE IN ENVIRONMENTAL SCIENCE-NON-Thesis

The EVS MS Non-thesis degree prepares students for a variety of careers in environmental sciences, similarly to the thesis option. The non-thesis degree requires course work, an extensive capstone Library Research Paper based on the primary scientific literature, and its oral defense. Those completing the computational track must take: Bio 531, 532, 533 and EVS 524/525.

MINIMUM COURSE AND SEMINAR REQUIREMENTS

BIO 500 (Orientation)	1 credit
BIO 684 (Research Seminar, EEEVS section)	1 credit
Quantitative Data Methods*	3 credits
Environmental Technologies*	3 credits
Environmental Law, Policy and Planning *	3 credits
Environmental Field and Laboratory Experience *	4-5 credits
Elective Courses *	12-13 credits
Capstone Courses **	4 credits
32 CREDITS (MINIMUM)	

* See Appendix D for a list of approved courses in each category

Note that Graduate College regulations specify that all BIO and EVS courses must be 500-level or above; not more than 7 credit hours of 400-level courses in related areas (not BIO or EVS) may be included if approved in advance by the Advisory Committee and the BGES Graduate Committee.

The EVS MS Coursework is designed to provide strong foundational knowledge in environmental science, as well as strengthen interdisciplinary skills. The Research Seminar (BIO 684) is a course presenting research specific to the environmental science, ecology and evolution to broaden students' perspectives on current research in environmental sciences. A set of core competencies in Quantitative Data Methods, Environmental Technologies, and Environmental Law/Policy/Planning are required. This is in keeping with the overall goals of the environmentally-related graduate programs to introduce students to areas outside their major area of study, developing the skills necessary for an interdisciplinary approach.

The remaining required coursework provides considerable flexibility, allowing students to focus in areas related to their interests. The EVS MS Advisor will ensure that a program of study is consistent with the student's academic background and appropriate to individual requirements. Additional elective courses should be selected with the approval of the EVS MS Advisor, as appropriate to the student's Plan of Study and the broader area of environmental studies; approved courses are listed in Appendix D. In general, electives should be approved EVS or BIO courses, but non-BGES courses appropriate for the student's Plan of Study are acceptable with the approval of the EVS MS Advisor. Courses to meet the environmental field experience requirement must provide substantial and rigorous experience in field methods in biology, geology or environmental sciences and similarly should be discussed with the EVS MS Advisor.

Non-thesis students may not use BIO 691/695 or BIO 891/895 (Research) credits toward their degree. Research (EVS 691/695) conducted in field settings may, by petition, be used to satisfy the requirement for Environmental Field Experience, but as a rule these credits will not count towards the required total of 32.

The four capstone course credits consist of one credit of EVS 690, focused on the writing of the capstone library research paper. Students are advised to start identifying a topic and a mentor early in the semester before they want to graduate. The capstone paper must be presented and defended before a faculty committee. The remaining three credits are from EVS 584, Envi-

ronmental Practicum, which is an interdisciplinary, team and problem-based course taken with other environmentally-focused master's students.

Minimum Grade Point Average

For graduation, non-thesis students must have a cumulative grade point average of 3.2 or better.

MAJOR ADVISOR

The EVS MS Advisor serves as the Major Advisor for non-thesis M.S. students and will work with the student to prepare a Plan of Study, which must be filed with the department's Graduate Program Office.

Library Research Paper

The final comprehensive examination (EVS 690) is based on a Library Research Paper that presents a critical review of original scientific literature on a topic chosen by the student. This requirement recognizes that, beyond a student's acquisition of knowledge in formal course work, the ability to read and critically evaluate original scientific literature plays a major role in the work expected of modern professionals with higher degrees in the sciences. The Library Research Paper is meant to demonstrate this ability for independent work beyond the requirements of individual courses. The choice of topic and the writing are supervised by a Capstone Mentor, a faculty member identified by the student who has agreed to mentor the student in this process. Students should consult with the EVS MS Advisor if help is needed in identifying a suitable Capstone Mentor. This Capstone Mentor plus two additional faculty members form an Examining Committee before which the student must defend the Paper in an oral examination. Expectations for capstone paper and defense should be discussed with the EVS MS Advisor and the Capstone Mentor.

DUAL J.D./MASTER OF SCIENCE IN ENVIRONMENTAL SCIENCE

This is dual degree program offered by the Department and the College of Law. Applicants must be accepted by each program. They must fulfill the requirements of each program separately, but cross-recognition of courses to fulfill requirements and integration of schedules should allow completion of both degrees within four years instead of the five required if done sequentially. Requirements for the M.S. are as stated in the previous section; consult the College of Law for J.D. requirements. A suggested course plan and complete requirements can be obtained from the BGES Graduate Program Office or see Appendix G. The original requirement that both degrees be finished before either could be received was removed in 2005. Graduating with the J.D. degree before completing the MS-EVS may slightly reduce the number of BIO, EVS, or non-Law course credits that can be counted towards the J.D.; there is no effect on the requirements for the MS-EVS.

The non-thesis version of the MS-EVS will not be accepted for this joint degree at the present time.

DOCTOR OF PHILOSOPHY IN REGULATORY BIOLOGY

This degree requires course work, original scientific research, a written grant proposal and its oral defense (the candidacy examination), a written dissertation and its oral defense, presentation of the dissertation research at a Department Seminar, and a manuscript suitable for publication as an original research report in a scientific journal. As the highest degree, one preparing the student for a career as a teacher and as an independent researcher, the program is designed to develop the student's broad, general knowledge of modern biology and specific, more detailed knowledge of the student's field of interest.

COURSE AND SEMINAR REQUIREMENTS*

BIO 700/702 (Orientation)	2 credits
BIO 704 (Biochemistry)	3 credits
BIO 784 (Grant Proposals or equivalent)	3 credit
BIO 888 (PhD Seminar)***	4 credits
BIO 884 (Departmental Seminar)	2 credits (3 maximum)
BIO 740/741(Biostatistics) or an equivalent graduate statistics course	3 credits
Additional (BIO) elective courses:	16 credits minimum
BIO 891/895 – Research **	40 credits minimum
Additional courses or research	17 credits minimum

Total past the bachelors degree 90 CREDITS (MINIMUM)

* For students with a Masters essentially equivalent to the CSU M.S. in Biology or EVS, the minimum number of credits would be 60 credits past the Masters, including at least 20 credits of CSU graduate course work, including Orientation I, Departmental Seminar (2x) and Graduate Seminars (4x).

**Graduate College regulations specify that you register for Bio 891 until you submit the CSU Dissertation/Thesis Proposal Approval Form and then you register for Bio 895.

*** If the research focus is ecological and if it can be documented that insufficient EEEVS Bio 888 options were available during the duration of a student's graduate enrollment, additional EEEVS Bio 884 courses may be utilized in place of Bio 888. If insufficient EEEVS Bio 884 courses are offered during the duration of a student's graduate enrollment, then other Bio/EVS graduate credits may be utilized.

In general, electives should be BIO courses, but non-BIO courses appropriate for the student's Plan of Study are acceptable with the approval of the student's Advisory Committee.

MAJOR ADVISOR AND ADVISORY COMMITTEE

Initially, the graduate program advisor will serve as the student's advisor. As soon as possible but no later than the completion of 9 hours of graduate work, students should approach a departmental graduate faculty member whose research area matches their own interests and who can provide any necessary laboratory space and research support. Together, the student and Major Advisor should discuss possible research projects and laboratory availability. Note that faculty need to be willing and able to have a student join their laboratory. This may not always be possible, particularly given time and monetary constraints. After reaching an agreement with a suitable Major Advisor,

students must complete the *Major Advisor Agreement* and submit to the department's Graduate Program Office.

A minimum of three additional faculty members from the Graduate Faculty of the Department will be selected by the student and Major Advisor to serve, along with the Major Advisor, as the Advisory Committee. As a general rule, the Advisory Committee must include at least one faculty member from CSU and one faculty member from CC. For topics outside the areas of expertise of CC faculty—these might include ecology, evolution, environmental science, or organismal biology, the student can replace the CC representative with another suitable member of the BGES or CSU Graduate Faculty. Students must obtain from the department's Graduate Program Office an *Advisory Committee Agreement*, which must be completed and submitted to the department's Graduate Program Office. If your committee requires an LRI faculty, you must take the following 6 courses: Bio 704, 804, 810, 824 and two Bio 872.

PLAN OF STUDY

Prior to completion of 18 credit hours of graduate work the student should prepare a *Plan of Study* listing the minimum course requirements for the degree, the courses taken and proposed towards fulfilling the requirements, and a schedule for completing the degree requirements. The *Plan of Study* should clearly identify the courses intended to meet the different requirements as well as outlining the schedule of courses to be taken in future semesters. A sample outline is included as Appendix B; other examples can be examined in the department's Graduate Program Office.

Students should include in their *Plan of Study* any proposed transfer credits and requests to waive Departmental and/or Graduate College requirements. (Requests to waive Graduate College requirements must also be submitted on a Graduate College *Petition Form*, which is reviewed by the GCCAS. If the Petition is approved by the GCCAS it is forwarded to the Graduate College Petitions Committee for approval.) The GCCAS will routinely consider and approve reasonable petitions to count towards the PhD course work requirements a total of 12 semester hours of graduate level course work from a prior Masters or other graduate study. These can be used to satisfy specific requirements and the minimum of 32 credits of course work will be reduced accordingly. Upper-level undergraduate courses taken as part of a Masters and course work beyond 12 credits as a rule will not be accepted. A total of ninety credits of course work and research is still required unless a petition to transfer credits is approved by the Graduate College, but see the proposed change noted above.

After the *Plan of Study* is completed, the student should schedule an Advisory Committee meeting to discuss the *Plan of Study* as well as any waivers requested. The student should obtain from the department's Graduate Program Office a *Plan of Study Certification* form for completion at the meeting. If the *Plan of Study* is approved, the student should have the form signed by the Advisory Committee at the end of the meeting. If revisions to the *Plan of Study* are required, the student may obtain approvals and signatures of members individually after revisions are complete. The original *Plan of Study Certification* together with a copy of the *Plan of Study* should be forwarded to the GCCAS for approval.

RESEARCH PROPOSAL

A brief research proposal should be written by the student in consultation with the Major Advisor. This proposal must be provided to all Advisory Committee members prior to a committee meeting to discuss and approve it. A completed *Thesis or Dissertation Proposal Approval Form* should be returned to the department's Graduate Program Office together with a copy of the Research Proposal.

TEACHING REQUIREMENTS

Each student must also deliver at least two one-hour lectures in courses of differing content and level. The student should consult with their Advisory Committee, select appropriate topics and courses, and then make arrangements with the professor in charge of the courses in which they wish to lecture. These lectures are given under the guidance of the course professors. Where TA responsibilities include a semester-long hour of introduction with background and lecture elements—not simply instructions for a lab, this may count for one lecture if the supervisor observes at least one hour. In either case, the supervising professor will certify to the GCCAS that the student has completed this requirement by completing the *Lecture Requirement Certification* form, which the student should obtain from the department's Graduate Program Office.

In addition, although no longer required, serving as a laboratory teaching assistant is strongly recommended for any student pursuing a college teaching career, as opposed to a career in research. This should be completed PRIOR to completion of course work. Students should consult their Advisory Committee and contact the Graduate Program Director and the Department Chair concerning teaching assistantships and selection of appropriate courses.

PROGRESS REPORTS AND COMMITTEE MEETINGS

Students must meet with their Advisory Committee, either collectively or individually, at least once a year. Failure to be able to document, if requested, progress to degree completion will be considered grounds for a warning and then for the department to NOT initiate the students GA contract.

Unsatisfactory progress may result in a review by the GCCAS and a recommendation for dismissal from the program.

CANDIDACY EXAMINATION

This examination consists of a Research Grant Proposal prepared by the student and a comprehensive oral examination administered by an Examining Committee. The objective of the oral examination is to test both broad, general knowledge of biology related to their chosen topic and specific, more detailed knowledge of the student's grant proposal. The objective of the Research Grant Proposal is to demonstrate that the student can independently conceive a well-rounded research project with clear hypotheses, justify the significance of the proposed questions, consider alternative methodological approaches, defend the approaches selected, and discuss possible outcomes, their interpretation, and their significance.

1. Students are required to pass the candidacy exam before the end of their 3rd year in the program. Students who fail to comply with this requirement will be expelled from the Regulatory Biology PhD program.

To help ensure that students meet this hard deadline, the department's secretary will send two reminders: (1) At the end of their 2nd year in the program, students will receive an email notifying them that they have only one more year to pass the candidacy exam (not just take the candidacy exam). (2) After two and half years in the program, students will be emailed a form that must be completed, signed, and returned to the department office. The form reads:

I, _____ (student name), acknowledge that I fully understand that I must pass the candidacy exam by the end of my third year in the program. Failure to meet this requirement of the Regulatory Biology PhD program will result in my expulsion from the PhD program.

_____ (Signature of the student) _____ (Date)

I, _____ (name of the major thesis advisor for the above-named student), acknowledge that I fully understand the requirements of the Regulatory Biology PhD program. If _____ (student name) does not pass the candidacy exam by the end of their third year in the PhD program, they will be expelled from the PhD program.

_____ (Signature of the major advisor) _____ (Date)

2. The format of the candidacy exam is a 6-page pre-doctoral or postdoctoral proposal. Students must submit a one-page summary of Specific Aims, a 6-page (or shorter) Research Strategy including Significance, Background/preliminary data, and Experimental Design, and a complete list of References and a proposal Title (not counted toward the 6-page limit). Particular attention will be paid to the research description. The questions should be novel and worth pursuing. A satisfactory proposal should address all sides of a problem; it should present several alternative lines of research (i.e., it should consider alternative questions and methods in case the favored approach does not succeed). The goal for the student is to demonstrate the ability to think clearly about a significant scientific problem, identify important questions and propose reasonable research goals, conceive suitable experiments to address the questions posed, understand the rationale and limitations of techniques used, and critically evaluate and interpret various possible outcomes of the experiments.

Plagiarism is absolutely prohibited. Should the exam committee find any evidence of plagiarism, the student will be disciplined according to rules described in the CSU Student Handbook and the BGES Graduate Student Handbook.

3. Before beginning the formal process, the student should identify a suitable topic and develop a short paragraph to briefly describe the research questions to be addressed (see details below). Then the student should obtain from the department's Graduate Program Office the Request for an Examining Committee and Approval of Research Grant Proposal Topic form, and schedule an Advisory Committee Meeting, at which time the form should be signed by all committee members. The completed form must be returned to the department's Graduate Program Office. A student may include a memorandum to the GCCAS with names of faculty members who could be appropriate members of the Examining Committee.

The Examining Committee will consist of six members of the Department's Graduate Faculty including:

- at least one member from the GCCAS, who shall serve as chair of the committee,
- at least one member from The Cleveland Clinic Foundation,
- at least one member from CSU,
- the student's Major Advisor,
- at most one additional member from the student's Advisory Committee.

No member of the examining committee shall satisfy more than one of the above requirements regarding the composition of the Examining Committee.

Students must choose either option A or option B regarding their candidacy exam proposal topic:

Option A:

The proposal should address a topic related to, but not identical with, the research questions planned for the Dissertation and described in the brief research proposal submitted with the Thesis or Dissertation Proposal Approval Form; furthermore, it should not overlap with current work in the Advisor's lab. Topics must be approved by the GCCAS (see below); topics that are judged to be too close to the student's proposed research or other work in the student's chosen laboratory will not be accepted.

Option B:

- i. PhD students will write a grant proposal on their own PhD project.
- ii. The proposal should include two major aims. Aim 1 should focus on the student's thesis project and may therefore be closely related to existing grant proposals prepared by the student's major thesis advisor. However, students are required to write this aim using their own words. Aim 2 should be an extension of Aim 1, which should be original, developed entirely by the student, and not included in any proposals prepared by the student's major thesis advisor. If the student's major thesis advisor has not prepared any grant proposals (submitted or in preparation) relating to the student's thesis project, both major aims may be original.

4. Regardless of the option chosen for the research proposal, all students must write a paragraph of "Respective Contributions" that clearly describes the role of the student and the major advisor in preparation of the actual proposal. Students are not allowed to copy-paste PI's grant proposals. Both the students and the PI are required to sign the page to acknowledge that the "description of their respective contributions" is true.
5. Scheduling the oral examination is the student's responsibility. After consulting with all of the members of the Examining Committee and contacting the Department Secretary to reserve a seminar room for the examination, the student should prepare a memo stating the date, time and location of the examination for distribution to all committee members. Students should allocate three hours for the oral examination. The grant proposal must be submitted to the Examining Committee at least one week prior to the oral examination.
6. The comprehensive oral examination takes, as its point of departure, the grant proposal. The Ph.D. degree should represent more than narrow, specialist knowledge and achievement. Therefore, the Examining Committee's task is to test general knowledge of modern biology as well as more detailed knowledge of the student's specialty. The student should be able to answer questions about basic topics in biology, particularly those related to the student's field of interest. The examination should not only focus narrowly on the specifics of the planned or accomplished dissertation research. The main objectives of the examination are to provide realistic feedback to the student on the level of performance required for successful completion and defense of the dissertation and to identify shortcomings in the student's general and specific knowledge that can be remedied by appropriate study and course work.
The oral presentation part of the candidacy exam should be limited to 30 min, which should illustrate the grant application with sufficient background information and details of the research strategy. If needed, the committee may question during the presentation for clarification purposes only. After the presentation, a round of questions/discussion will take place in

which committee members will be allowed 10 minutes each. This first round of questions should cover the candidacy topic and research strategy. If the committee deems it necessary, each member may continue to ask questions specifically related to the proposal or general biology questions related to the content of the proposal (10 min per committee member).

The major thesis advisor of the student is allowed to attend the exam. However, the major advisor is not allowed to give the student any help/hint in any format during the exam, and exam committee members should refrain from including the major advisor in any discussions during the exam. If this rule is violated twice, the student's major thesis advisor will be removed from the candidacy exam by the committee chair.

7. The outcome of the examination is determined by majority vote of the Examining Committee (including the Major Advisor); a tie does not count as pass. The possible outcomes of the first attempt are: PASS AT THE DOCTORAL LEVEL (satisfactory for admission to candidacy at the doctoral level) or REPEAT (unsatisfactory); the possible outcomes of a second attempt are: PASS AT THE DOCTORAL LEVEL, PASS AT THE MASTERS LEVEL (unsatisfactory for admission to candidacy at the doctoral level but satisfies the Library Research Paper requirement for the non-thesis Masters if the student chooses to switch to this program), or FAILURE. Pass at the doctoral level will also satisfy the Library Research Paper requirement for the non-thesis Masters. The chair of the Examining Committee shall prepare a brief written report outlining the result of the examination. In the case of a REPEAT, the report will include any requirements imposed by the Examining Committee for the next examination. This report will be distributed to the student, the Examining Committee members and the GCCAS within one week of the examination. The exam may be repeated once, with no more than 6 months intervening between attempts. Two failures to pass the examination at the doctoral level shall result in a recommendation to the Graduate Dean for dismissal from the Ph.D. program.

RESIDENCY REQUIREMENT

All Ph.D. students must spend no less than one year (three consecutive terms) in residence as full-time students after reaching candidacy. Candidates must be continuously enrolled for a minimum of one credit hour of BIO 895 (Research) until graduation.

DISSERTATION DEFENSE COMMITTEE

The Dissertation Defense Committee shall consist of the following:

- Major Advisor
- Advisory Committee
- An additional department Graduate Faculty Member (the Internal Reader)
- An external member (the External Reader) who is not a member of the Department's Graduate Faculty but possesses equivalent professional and academic qualifications

The student and their Advisory Committee should submit the *Request for a Dissertation Defense Committee Form* to the department's Graduate Program Office along with recommendations for Internal and External Readers for approval by the GCCAS. The student should suggest in order of preference names with telephone numbers, email and mail addresses of people who would be appropriate readers. If the suggestions for external reader are apt to be unknown, the student should indicate in a

sentence or two why the person is appropriate. If they wish, the student or the Advisor may contact these people to establish their willingness to serve and their availability, but it is the role of the GCCAS to make the final decision and extend the formal invitation to serve on the Dissertation Defense Committee.

RESEARCH COMPLETION, WRITTEN DISSERTATION, AND ORAL DEFENSE

Completion of the Ph.D. degree requires a written dissertation (numerous examples are available in the department's Graduate Program Office) approved by the Advisory Committee, a Departmental Seminar presentation of the thesis research, and an Oral Defense of the Dissertation. The student's Dissertation Defense Committee conducts the Oral Defense, although it is open to all faculty members. Various deadlines for completion of the degree are listed below.

Six months prior to the anticipated dissertation defense, the student should schedule an Advisory Committee meeting to determine whether the accomplished research is complete and sufficient, in principle, to satisfy the degree requirements. Suggested members of the Dissertation Defense Committee (the "internal" and "external" committee members) should also be determined at this meeting. Agreement should be documented by submitting a completed *Research Completion Certification* to the department's Graduate Program Office.

The written dissertation should be drafted in conformity with the *Thesis and Dissertation Format Guidelines* as required by the Graduate College. The draft to serve as the basis for the defense must include all tables and figures as well as the reference list. The student must first have the Major Advisor approve the draft and fill out an *Approval to Schedule Thesis and Dissertation Defense* form, which must be returned to the Graduate Program Office. Then the student should consult with the members of the Advisory Committee and the Department Administrative Assistant in order to schedule dates and rooms for the Department Seminar and Oral Defense. Typically the oral defense takes place immediately following the Departmental Seminar; both must take place while a semester is in session.

The student must submit the final draft of the dissertation to each member of the Dissertation Defense Committee at least two weeks prior to the anticipated dissertation defense. At this time, a copy of the abstract of the dissertation together with the title, place, and time for the seminar must be provided to the department's Graduate Program Office for distribution to all faculty and students.

One week before the defense, a draft of the dissertation must be placed in the department's Graduate Program Office by arrangement with the Graduate Program Director.

At the Departmental Seminar, the student presents the dissertation research to the faculty and students of the Department. All persons attending the Seminar may ask questions.

Attendance at the Oral Defense is limited to the student and members of the faculty committee. At the Oral Defense, the student and faculty of the Dissertation Defense Committee engage in a detailed discussion and critique of the dissertation, offering the student the opportunity to demonstrate competence in his or her research field. Dissertation Defense Committee members are required to attend both the Departmental Seminar and the Oral Defense.

The outcome of the Oral Defense is determined by majority vote of the Dissertation Defense Committee. The possible outcomes of the examination are APPROVAL, CONDITIONAL APPROVAL or DISAPPROVAL. The Committee notes the result on the *Ph.D. Dissertation Seminar and Defense Form*. In addition, the chair of the Dissertation Defense Committee shall prepare a brief written report outlining the result of the examination. In the case of a CONDITIONAL APPROVAL, the report will include the conditions to be satisfied before final approval is granted; the Committee signifies that these conditions have been met when it signs the final version of the dissertation. In the case of DISAPPROVAL on the first attempt, the report will include any requirements imposed by the Committee for the next examination. Conditions and requirements may in-

clude repetition of the Departmental Seminar. This report will be distributed to the student, the Dissertation Defense Committee members and the GCCAS within one week of the Oral Defense. The Oral Defense may be repeated once, with no more than two terms intervening between repetitions. Failure to pass (an outcome of disapproval) in two attempts shall result in dismissal from the Ph.D. program.

The final version of the dissertation, which must incorporate any and all changes mandated at the Oral Defense and conform to the *Thesis and Dissertation Format Guidelines* as required by the Graduate College, must be approved by the Dissertation Defense Committee. A copy of the dissertation must be presented to the department's Graduate Program Director and to the Graduate College for final approval of the format. All instructions from the graduate college must be followed.

MANUSCRIPT/REPRINT OF AN ORIGINAL RESEARCH REPORT

Besides the final version of the dissertation, the required manuscript of an article in a format suitable for publication must be presented to the department's Graduate Program Office for final approval by the Graduate Program Director. Students who have published their dissertation work may substitute a reprint for the required manuscript. Multi-author papers are acceptable in areas where this is common practice if the student's work comprises a significant portion of the reported work and the student plays a major role in composing the report. The manuscript or reprint must be approved and initialed by the Major Advisor.

DEGREE COMPLETION

After the student has satisfied all the degree requirements, the department's Graduate Program Office will send a *Notice of Completion for Doctoral Degree Requirements* to the Graduate College. After final approval by the Graduate College, the Graduation Office will order a Diploma and complete the arrangements for the student's graduation. One copy of this form should accompany the thesis copies taken to the library for binding.

Ph.D. DEADLINES

The following chart gives deadlines according to credit hours completed that are recommended for timely completion of the Ph.D. degree and those that are required in order to remain in good standing within the program.

Action	Recommended	Required
Select Advisor	9	20
Plan of Study	18	24
Research Proposal	27	30*
Candidacy Exam	36	45*

CHECKLIST (Ph.D. DEGREE)

- Major Advisor - Obtain and complete the *Major Advisor Agreement* form.

- Advisory Committee – Together with your Major Advisor, select appropriate faculty members for the committee. Obtain the *Advisory Committee Agreement* form, and submit the completed original to the department's Graduate Program Office.
- Plan of Study - Prepare a Plan of Study with your Major Advisor. Obtain and complete the *Plan of Study Certification* form and submit the original, together with a copy of your *Plan of Study*, to department's Graduate Program Office.
- Research Proposal - Prepare a Research Proposal and distribute it to your Advisory Committee. Obtain and complete the *Thesis or Dissertation Proposal Approval Form*. Submit the completed form, together with a copy of your Research Proposal, to the department's Graduate Program Office.
- Candidacy Examination – Obtain a *Request for an Examining Committee and Approval of Research Grant Proposal Topic* form. Schedule an Advisory Committee meeting and have the committee approve that you are ready to take your Candidacy Examination. Submit the completed form to the department's Graduate Program Office for the assignment of Examining Committee members by the GCCAS.
- Complete the teaching requirements, if you have not already done so.
- Research Completion - Obtain the *Certification of Research Completion* form and schedule an Advisory Committee meeting the term PRIOR to the one in which you anticipate completing your degree requirements. Submit the completed form to the department's Graduate Program Office. At the same committee meeting, you should discuss appropriate members for the Dissertation Defense Committee and submit the suggested names for approval by the GCCAS along with the *Request for a Dissertation Defense Committee*. Submit the *Application for a Master's and Doctoral Degree*, if this has not already been done.
- Schedule the Dissertation Seminar and Oral Defense. Both must be held during the academic term; the Oral Defense typically takes place immediately following the Dissertation Seminar. Before scheduling dates, you must have your Major Advisor approve a draft of your dissertation and you must submit an *Approval to Schedule Thesis and Dissertation Defense* form.
- Written Dissertation- A final draft of your dissertation, APPROVED BY YOUR MAJOR ADVISOR, must be submitted to the Dissertation Defense Committee members at least three weeks prior to the scheduled defense date. Submit seminar title, date, and place along with a copy of the dissertation abstract to the department's Graduate Program Office.
- Submit a copy of dissertation to the Graduate Program Office at least one week prior to your defense.
- Complete Dissertation Seminar and Oral Defense. File the *Ph.D. Dissertation Seminar and Defense Form*.
- Revise the Dissertation as required.

- Format Approval - A copy of your Dissertation that has been approved by your Advisory Committee should be shown to the Graduate Program Director and to the Graduate College for approval of its style and format (i.e., margins, table of contents, figures, etc.) This should be done PRIOR to photocopying.
- Final Copy of Dissertation - Copies of your approved dissertation must be submitted to the department's Graduate Program Office. An electronic version must be submitted to OhioLINK ETD Center.
- A reprint or copy of a published report or a manuscript based on your thesis in a format suitable for publication that has been approved and initialed by your Major Advisor, must be delivered to the department's Graduate Program Office.
- When all requirements are completed--typically when the final version of the dissertation is ready--the Graduate Program Director and Chair will fill out a *Notice of Completion*. This form goes to the Graduate College and then one part of this form should accompany the dissertation copies taken to the library for binding.
- For assessment purposes, complete the Department's Exit Survey and Survey of Techniques

DOCTOR OF PHILOSOPHY IN REGULATORY BIOLOGY WITH A SPECIALIZATION IN CELLULAR AND MOLECULAR MEDICINE

The Cellular and Molecular Medicine Specialization (CMMS) is an interdisciplinary initiative organized by three doctoral programs at CSU (Regulatory Biology, Clinical-Bioanalytical Chemistry, and Applied Biomedical Engineering) together with the Cleveland Clinic. It is not a new degree program but rather a specialization undertaken within one of the three existing programs. The CMMS may be a source of research assistantships and travel funds. Further information can be obtained from the director of the CMMS program. The program is currently administered by BAHI, the Biomedical and Health Sciences Institute.

The degree requirements for BGES students selecting the Cellular and Molecular Medicine Specialization (CMMS) are essentially the same as those for the standard doctoral course of study outlined above. In addition, as outlined below, the CMMS specifies that students attend a Cellular and Molecular Medicine Seminar, a bioethics workshop, and demonstrate competence in the following areas: graduate biochemistry; bioethics; molecular biology and genetics/cell biology or physiology or macromolecular structure and dynamics. Major Advisors of CMMS students must be affiliated with the CMMS; they can be from either CSU or CCF. The Major Advisor typically is the primary supervisor and the source of support for the student's dissertation research. The Major Advisor chairs the Advisory Committee. This committee must fulfill Department requirements and should have substantial membership from both institutes. Together, the Major Advisor and the Advisory Committee supervise the student's plan of study and research proposal, monitor the student's progress, certify that requirements have been met in a timely fashion, and process all petitions, progress reports and other communications with the GCCAS and the BGES Graduate Program Director as well as with the CMMS Committee.

Besides fulfilling requirements for the PhD in Regulatory Biology, described in previous sections, CMMS students will establish competencies in several required subjects by taking core courses or receiving credit by examination for the required courses. Core courses provide a common base of knowledge in biomolecular structures and functions and state-of-the-art analytical techniques. Additional required and elective course work and research training of each student are monitored by the student's Dissertation Committee and the CMMS Committee according to the guidelines, requirements, rules and regulations of the intended doctoral program, the CMM specialization, and the CSU Graduate College.

ADMISSION TO THE CELLULAR AND MOLECULAR MEDICINE SPECIALIZATION

Formal admission to the CMMS is decided by the CMMS Committee. All degree-seeking students in the Regulatory Biology, Clinical-Bioanalytical Chemistry, and Applied Biomedical Engineering doctoral programs can choose to specialize in Cellular and Molecular Medicine by completing the required core curriculum listed below and performing dissertation research in Cellular and Molecular Medicine.

New applicants to the doctoral programs in Regulatory Biology, Clinical-Bioanalytical Chemistry and Applied Biomedical Engineering may indicate their interest in CMMS on their applications. Admission to graduate studies in one of the doctoral programs, referred to as the "home program", is decided by the graduate program to which the applicant applies. Applicants can also declare their intent to enroll in the CMMS once they have been accepted by a home program. For the present purpose, the home program is the BGES PhD in Regulatory Biology.

CMMS CURRICULUM REQUIREMENTS

Core and elective courses are designed to satisfy CMMS requirements as well as some home program requirements. Hence, although the CMMS requirements as outlined here are the same for all students regardless of department, the number of extra credit hours needed for the CMMS may vary according to the doctoral degree requirements of the student's home program. Ultimately, the student's demonstration of the required competencies is determined by the Advisory Committee based on the student's performance in courses, formal exams, and informal discussions. The Advisory Committee and the rules of the home department also govern transfer of credits from other universities towards satisfying CMMS requirements.

Students will be required to demonstrate competencies in the following graduate level subjects:

Biochemistry

Molecular Biology and Genetics

Cell Biology or Physiology or Macromolecular Structure and Dynamics

Bioethics

Proposed core courses for satisfying required competencies in Cellular and Molecular Medicine Specialization:

(courses are presently being offered in the three doctoral programs or will be designed as team-taught courses)

(1) Graduate Biochemistry: (BIO 504/704 or CHM 653/753) It provides the introduction for an understanding of macromolecular structure, physical properties and function of proteins and nucleic acids. Pre-requisites: as listed for the courses or by permission of instructor.

(2) Molecular Biology and Genetics: (BIO 610/810) Structure and function of nucleic acids. Replication, modification, and recombination of DNA. Transcription, translation and regulation of transcription and translation, Pre-requisites: BIO 504/704 or equivalent.

(3) Macromolecular Structure and Dynamics: (CHM 661/761) Basics and application of analytical techniques to the study of macromolecular structure and dynamics, including protein and RNA folding, protein and nucleic acid structure and function. Spectroscopic examination of biomolecules including the use of optical techniques, NMR methods, FTIR, EPR, mass spectrometry and X-ray methods. Separation techniques including gel electrophoresis, HPLC, and CE. Pre-requisites: undergraduate organic chemistry and physical or analytical chemistry, or permission of the instructor.

(4) Cell Biology: (BIO 604/804) Examination of basic cellular processes including structure and function of organelles and biomembranes, intracellular transport, cell motility and shape, and cellular signaling events as they relate to proliferation, differentiation, apoptosis, and the integration of cells into tissues. Heavy reliance on the experimental basis for the understanding of these phenomena, with extensive use of the primary literature.

(5) Physiology: (e.g., Bio 624/824 Fundamentals of Biomedical Physiology)

(6) Bioethics: (e.g., PHL 529 Bioethics, a web-based 1 credit course offered by Joe De-Marco)

- (7) Special Topics in Cellular or Molecular Medicine; 1, 2, or 3 credits, as determined by the home department hosting the course; course numbers will be created in each department as appropriate.

A sequence of seminars will be designated Cellular and Molecular Medicine Seminars for each semester. These seminars will be selected from seminars offered by the home departments and by CCF. Attendance at these seminars will be based on recommendation of the student's advisor(s).

Additional electives/special topic courses or workshops to be taken as recommended by the Major Advisor: (These electives can be courses already offered at CSU or courses to be created and one-time, special topics courses; they may be team-taught or taught by CSU/CCF faculty; 1 semester, 1-3 credits. Course numbers will be created in the different home departments as appropriate.)

Topics for future courses or special topics offerings include:

Biostatistics/Epidemiology

Biological Applications of NMR/ Mass Spectrometry/EPR

Macromolecular Crystallography

Gene Chip Technology/ Proteomics

Computational Methods in Biomedical Research/Bioinformatics

Molecular Imaging/ Chemical Imaging Techniques

Separation Techniques: CE, HPLC, 2 dimensional gel separation

Existing courses include:

Pharmacology (e.g., BIO 606/806)

Clinical Chemistry (e.g., CHM 651/751, 652/752)

X-ray Crystallography (e.g., CHM 618/718)

Advanced Mass Spectrometry (e.g., CHM 615/715)

Tissue Engineering (e.g., CHE 753)

Biomechanical Engineering (e.g., CHE 755)

Biomaterials (e.g., CHE 755)

Medical Device Design (e.g., CHE 757)

Additional courses are listed in the Graduate Bulletin under each doctoral program.

Curriculum example for students who elect the Cellular and Molecular Medicine Specialization

Fall

Graduate Biochemistry, 3 credits

Macromolecular Structure and Dynamics, 3 credits

or Cell Biology, 3 credits

Required courses in doctoral program, 3-6 credits

Molecular Medicine Seminar**

* optional according to BGES rules

**as recommended by Major Advisor

Spring

Molecular Biology and Genetics, 3 credits

Required courses in doctoral program, 3 credits

Research rotations, 6 credits *

Bioethics Workshop

Molecular Medicine Seminar**

Physiology, 3 credits

For subsequent years, elective courses will be selected by the student in accord with the student's interests, the recommendations of the Advisor and Advisory Committee, and the requirements of the BGES PhD program and the MM specialization..

CMMS RESEARCH ASSISTANTSHIPS

Especially promising applicants will be considered for several CMMS research assistantships after admission by the home program. Such an assistantship relieves the student from teaching and provides an opportunity to concentrate on research. To encourage the highest level of collaboration and shared responsibilities between faculty from the two institutes, research assistantships for projects in the CMMS will be funded jointly by CCF and CSU but this research support will be limited to two years. After this time, it is expected that students making satisfactory progress will be supported by the advisors' grant funding or they will compete successfully for other departmental sources of support (e.g., TAs).

Admitted applicants not granted CMMS research assistantships will be considered for other forms of support available through the home department or may be self-supporting. Students not receiving a CMMS research assistantship can still choose to specialize in Cellular and Molecular Medicine by applying for membership and completing the requirements.

APPENDIX A - GRADUATE COLLEGE AND DEPARTMENT FORMS

The forms listed below are ones you will need as you progress through the Graduate Program. Not all students will use all of these forms. Some forms are initiated by the Department, rather than by the student (e.g., *Completion of Degree Requirements*)

GRADUATE COLLEGE FORMS (available on line at the Graduate College website)	
Form	Function
<i>Add/drop*</i>	Used to add or drop a course AFTER registering
<i>Agreement for Services</i>	Contract used to employ graduate assistants
<i>Application for a Master's and Doctoral Degree* (Application for Graduation)</i>	Used to apply for graduation (typically one semester before finally completing requirements)
<i>Authorization to Audit Course</i>	Used to take a course for no credit or grade (NOTE: Students may not audit a course required for their Plan of Study)
<i>Change of Grade</i>	Used by an instructor to change a course grade after grades have been submitted. GRADES ARE ONLY CHANGED DUE TO A COMPUTATIONAL ERROR. If an instructor and student disagree about a grade, a GRADE DISPUTE must be initiated by the student
<i>Change of Grading Status*</i>	Used during the first week of courses to change the student's grading status for a course (e.g., Letter Grade to Audit, etc.)
<i>Free Application for Federal Student Aid</i>	Application forms for federal financial aid
<i>Graduate Credit by Examination*[@]</i>	Used to receive credit by examination for a Graduate Course. GCCAS and Graduate Dean approval required
<i>Graduate Credit Transfer Form*</i>	Used to transfer credit from another institution
<i>Graduate Program Transfer Request*[@]</i>	Used to change a student's program status, e.g., M.S. to Ph.D., or to another Department. (Note: changing between thesis and non-thesis M.S. merely requires a petition to the BGES Graduate Program Office)
<i>Graduate Student Authorization to take an Overload</i>	Must be completed in order to take more than 16 credit hours
<i>Graduate Student Late Registration/Late Add Form*[@]</i>	For students who have not previously registered for courses for the academic term in question
<i>Graduate Student Petition Form*[@]</i>	Must be used for petitions involving University and Graduate College regulations
<i>Enrollment Reinstatement Request</i>	Used early in a semester to re-enroll in courses from which a student was deregistered for some reason (e.g., non-payment of tuition)
I-9	Used to document employment eligibility verification

<i>Notice of Completion of Graduate Degree Requirements*[@]</i>	Filed by the Department to certify that a student's degree requirements are complete
<i>Permit to Add a Course or Register after Deadline*</i>	Used to register for courses after deadline for normal changes in registration (see Add/drop)
<i>Personnel Data Worksheet</i>	Form required of all graduate assistants and student employees
<i>Petition Form*</i>	A general purpose form usually used to request an exception to established Graduate College Requirements and Regulations
<i>Re-Enrollment Application</i>	Used to re-enroll at CSU after a lapse of two or more semesters.
<i>Residence Petition</i>	Used by non-residents to petition for status as an Ohio resident (reduces tuition charges)
<i>Review of Graduate Dissertation Receipt</i>	Received when you submit your dissertation to the Graduate College Office
<i>Satisfactory/Failure Grade Status</i>	Must be filled out to take a course with a grade of Satisfactory/ Unsatisfactory. (Courses required for your program may not be taken S/F)
<i>Thesis or Dissertation Proposal Approval Form*[@]</i>	Used to inform the Graduate College that the Proposal has been accepted by the Advisory Committee; submit together with a copy of your proposal, which is for the Department files
<i>Transcript Request Form</i>	Used to request transcripts from the Registrar
<i>Transient Student Status*[@]</i>	Used if you wish to take courses at another institution (Note, courses will not necessarily count toward your degree requirements at CSU)

DEPARTMENT FORMS (available on line at the BGES website)	
Form	Function
<i>Major Advisor Agreement</i>	Used to declare a Major Advisor
<i>Advisory Committee Agreement</i>	Used to document Advisory Committee
<i>Masters Thesis Seminar and Defense Form</i>	Used to document presentation of the seminar and to record the decision of the Committee
<i>Masters Non-Thesis Examination Form</i>	Used to record the decision of the Committee
<i>Non-Thesis M.S. Examining Committee Agreement</i>	Used to document Examining Committee
<i>PhD Dissertation Seminar and Defense Form</i>	Used to document presentation of the seminar and to record the decision of the Committee
<i>Plan of Study Certification</i>	Used to document approval of the Plan of Study by the Advisory Committee
<i>Request for an Examining Committee and Approval of Research Grant Proposal Topic (Ph.D.)</i>	Used to ask GCCAS to assign a committee for the Candidacy Exam and to approve the selected topic for the <i>Research Grant Proposal</i> ; submit CSU Dissertation Proposal Approval Form if not already done

<i>Certification of Research Completion</i>	Must be completed by the Advisory Committee to document the completion of research and readiness to complete the Thesis or Dissertation
<i>Request for a Dissertation Defense Committee (Ph.D.)</i>	Used to suggest Dissertation Defense Committee for approval by GCCAS
<i>Approval to Schedule Thesis and Dissertation Defense</i>	Used to have the Major Advisor certify that the draft of the thesis or dissertation is sufficient for proceeding to schedule the oral defense
<i>Lecture Teaching Requirement Certification (Ph.D.)</i>	To document successful completion of a lecture fulfilling part of the teaching requirement
<i>Laboratory Teaching Requirement Certification (Ph.D.)</i>	To document successful completion of a teaching assistantship fulfilling part of the teaching requirement
<i>Progress Report</i>	Required twice a year to report progress in research and course work (there is no form; see the General Requirements for suggestions on content). Must be initialed by Major Advisor and circulated to all Advisory Committee members
<i>Petitions/Memos</i>	To request GCCAS to approve changes in status, credits, requirements, etc. (not a preprinted form, just any letter or memo that you write) or use the Graduate College Petition Form; Petitions involving University or Graduate College regulations must be submitted on the Graduate Student Petition Form

APPENDIX B - PLAN OF STUDY

A good Plan of Study should show explicitly both the progression of course work and how the courses in the end satisfy the degree requirements. The first suggests a chronological arrangement of the courses and other requirements. The second suggests an arrangement by requirement. Given that many courses are not given every semester and the titles and topics of some courses are not known far in advance, the detailed timing must remain tentative for semesters in the future. Nevertheless, you should not simply list courses, but should use all available information and outline a reasonable schedule while realizing that the timing may change. [These examples have not been updated to match changed in program requirements.]

The example below is modified from a particularly clear submission. It includes a calculation of semester equivalents for quarter credits, a complication that will not affect newer students. Note that a good Plan of Study includes both of the arrangements shown below. However, as long as you make both types of information clear, you do not need to slavishly follow the format shown.

SAMPLE PLAN OF STUDY: M.S. (THESIS OPTION)

1. Plan of Study for Masters

[This arrangement shows the progression through the program and clearly shows whether semester course loads--here less than full-time--are reasonable and meet enrollment requirements.]

Quarter/ Semester	Course Number	Course Description	Quarter Credit	Semester Credit	Requirements or Credits Fulfilled
Fall 1996	BIO 500	Graduate Orientation	1	0.67	1 of 3 (quarters)
Fall 1996	BIO 407	Biochemistry	4	3	elective: total 3
Winter 1997	BIO 500	Graduate Orientation	1	0.67	2 of 3 (quarters)
Winter 1997	BIO 540/541	Biostatistics	4	3	biostatistics
Spring 1997	BIO 500	Graduate Orientation	1	0.66	3 of 3 (quarters)
Spring 1997	BIO 606	Pharmacology	4	3	elective: total 6
Summer 1997	BIO 688	M.S. Seminar	2	1	1 of 3
Fall 1997	BIO 501	Biochemistry	4	3	biochemistry
Winter 1998	BIO535	Molecular Biology	4	3	elective: total 9
Spring 1998	BIO 608	Pharmacodynamics	4	3	elective: total 12
Spring 1998	BIO 688	M.S. Seminar	2	1	2 of 3
Summer 1998	BIO 688	M.S. Seminar	2	1	3 of 3
Fall 1998	BIO 695*	M.S. Research	3	2	research: total 2
	*Need CSU Thesis Prop.Appr.Form				
Spring 1999	BIO 695*	M.S. Research	6	4	research: total 6
Summer/Fall 1999	BIO 695*	M.S. Research	6	4	research: total 10

2. Plan of Study for Ph.D./student does not have a relevant M.S.

[Ph.D. students might also show Admission to Candidacy Examination and teaching requirements.]

Plan of Study for a Ph.D. in Regulatory Biology (focusing on Molecular Biology)

<u>Course</u>		<u>Course #</u>	<u>Credit Hours</u>	<u>Requirements or Credits</u>	
<u>Fall 1998</u>	Orientation	Bio. 700	1	Orientation	1 of 2
	Biochemistry	Bio. 704	3	Biochemistry	3 of 3
	Molecular Biology	Bio. 810	3	Elective [c/m]	3 of 6
	Research	Bio. 891	5	Research	5 of 48
<u>Spring 1999</u>	Orientation	Bio. 702	1	Orientation	2 of 2
	Tech.Molec Bio	Bio. 735	4	Tools	4 of 4
	Develop. Genetics	Bio. 834	3	Elective [o/e]	3 of 6
	Seminar	Bio. 888	1	Seminars	1 of 4
	Research	Bio. 891	1	Research	6 of 48
<u>Summer 1999</u>	Advances in Bio.	Bio. 870	3	Elective	3 of 13
	Research	Bio. 895	0	Research	6 of 48
<u>Fall 1999</u>	Adv. In Mol. Biol.	Bio. 872	3	Elective [c/m]	6 of 6
	Recombinant DNA	Bio. 830	3	Elective	9 of 13
	Seminar	Bio. 888	1	Seminars	2 of 4
	Research	Bio. 895*	2	Research	8 of 48
	*need CSU Dis.Prop. Appr. Form				
<u>Spring 2000</u>	Biostatistics	Bio. 740/741	3	Elective	12 of 13
	Proliferative Signals	Bio. 816	3	Elective	15 of 13
	Seminar	Bio. 888	1	Seminars	3 of 4
	Research	Bio. 895*	2	Research	16 of 48
<u>Summer 2000</u>	Research	none		Research	16 of 48
<u>Fall 2000</u>	Evol. Genetics	Bio. 736	3	Elective [o/e]	6 of 6
	Seminar	Bio. 888	1	Seminars	4 of 4
	Adv. In Mol. Biol.	Bio. 872	3	Elective	6 of 13
	Research	Bio. 895*	2	Research	18 of 48
<u>Spring 2001</u>	Research	Bio. 895*	9	Research	27 of 48
<u>Summer 2001</u>	Research	Bio. 895*	?	Research	27 of 48
<u>Fall 2001</u>	Research	Bio. 895*	9	Research	36 of 48
<u>Spring 2002</u>	Research	Bio. 895*	9	Research	45 of 48
<u>Summer 2002</u>	Research	Bio. 895*	9	Research	54 of 48

or

<u>Fall 2002</u>	Research	Bio. 895*	9	Research	54of 48
Total course credits		36	Total credits		90

APPENDIX C - RESEARCH PROPOSAL

Determining what is a sufficient research proposal is primarily up to the Advisory Committee. There is no single format, so no sample is given here. A good research proposal need not be longer than a couple pages, but it should outline the major questions to be addressed, sketch the context of the research and discuss relevant reported findings from the literature, describe the experimental approach to be taken, and indicate the experimental design and methods to be used. It need not list in detail all individual experiments and controls or give details of methods.

The research proposal should outline a sufficient body of work to constitute a thesis or dissertation when the work is done. The scope should be such that the work can be performed and the degree completed in a reasonable amount of time. Where this judgement of sufficiency might depend upon the as yet unknown outcome of the experiments, alternative outcomes and plans of action should be considered.

APPENDIX D – APPROVED COURSES TO SATISFY REQUIREMENTS FOR THE MS ENVIRONMENTAL SCIENCE

TABLE 1: INTERDISCIPLINARY CORE COMPETENCY REQUIREMENTS

Quantitative data methods

- BIO 540 – Biostatistics or equivalent graduate-level quantitative/numerical course

Environmental technologies

- CVE 450 - Environmental Technology
- EVS 524 & EVS 525 – Introduction to GIS and remote sensing or equivalent

Environmental policy, law and planning

- LAW 671 - Environmental Law
- UST 652 - Environmental Policy and Administration or equivalent environmental policy/planning course
- UST 613 - Land Use and Sustainability
- UST 653 - Ecological Landscape Planning and Management

TABLE 2: ELECTIVE COURSES

- EVS 506 - Ecosystem Sciences
- EVS 530 - Climate Change: An Interdisciplinary Overview
- EVS 570 - Aquatic Ecosystems
- BIO 504 - Biological Chemistry
- BIO 516 - Microbiology
- BIO 548 - Biogeography
- BIO 550 - Evolutionary Biology
- BIO 552 - Urban Ecology
- BIO 566 - Invasion Ecology
- BIO 572 - Wetland Ecology
- BIO 574 - Stream Ecology
- BIO 578 - Plant Ecology
- CHM 504 - Environmental Chemistry
- CHM 531 - Advanced Organic Chemistry
- PHY 570 - Environmental Physics

For BIO/EVS 594 Special Topics courses, please ask the EVS MS Advisor as many of these also satisfy this requirement.

TABLE 3: ENVIRONMENTAL FIELD AND LAB EXPERIENCE

- EVS 571 - Aquatic Ecosystems Laboratory
- EVS 596 - Independent Study in Environmental Science *
- BIO 517 - Microbiology Lab
- BIO 553 - Urban Ecology Lab
- BIO 573 - Wetland Ecology Lab
- BIO 575 - Stream Ecology Lab
- BIO 579 - Plant Ecology Laboratory
- BIO 651 - Advanced Research in Field Biology

For BIO/EVS 593 Special Topics with Lab courses, please ask the EVS MS Advisor as many of these also satisfy this requirement.

*For students doing thesis research, EVS 596 Independent Study credit should not be taken with a student's thesis advisor.

APPENDIX E – CELLULAR/MOLECULAR AND ORGANISMAL/EVOLUTION COURSES

The following list indicates course categories for the purpose of satisfying the old Ph.D. distribution requirement for electives in cellular/molecular (c/m, minimum 6 credits) and organismal/evolutionary (o/e, minimum 6 credits) biology. For courses with variable content (e.g., BIO 670/870), the instructor will be asked to declare an appropriate category based on its content. Courses listed as either can be used only once to satisfy requirements for one category or the other, as approved by the course instructor and the student's Advisory Committee. [numbers prior to Fall 2000].

BIO 510/710	[519/719]	Practice and Theory of Light Microscopy	c/m
BIO 511/711		Practice and Theory of Light Microscopy Laboratory	c/m
BIO 512/712	[512/712]	Advanced Immunology	c/m
BIO 513/713		Advanced Immunology Laboratory	c/m
BIO 516/716	[517/717]	Protozoology	c/m or o/e
BIO 517/717		Protozoology Laboratory	c/m or o/e
BIO 518/718	[518/718]	Histology	o/e
BIO 519/719		Histology Laboratory	o/e
BIO 528/728		Endocrinology	o/e
BIO 536/736	[535/735]	Evolutionary Genetics	o/e
BIO 542/742	[539/739]	Morphometrics	o/e
BIO 550/750		Evolution	o/e
BIO 551/751		Evolution Laboratory	o/e
BIO 554/754		Ecology	o/e
BIO 555/755		Ecology Laboratory	o/e
BIO 558/758	[559/759]	Behavior	o/e
BIO 564/764	[561/761]	Developmental Biology	c/m or o/e
BIO 565/765		Developmental Biology Laboratory	c/m or o/e
BIO 578/778	[522/722]	Morphology of Flowering Plants	o/e
BIO 579/779		Morphology of Flowering Plants Laboratory	o/e
BIO 586/786		Neurobiology	o/e
BIO 587/787		Neurobiology Laboratory	o/e
BIO 602/802	[603/803]	Enzymology	c/m
BIO 606/806		Pharmacology	c/m or o/e
BIO 604/804		Cell Biology	c/m or o/e
BIO 608/808	[607/707]	Pharmacodynamics	o/e
BIO 612/812	[611/811]	Microbial Physiology	c/m
BIO 615/815	[616/816]	Proliferative Signal Transduction	c/m
BIO 622/822		Advanced Vertebrate Physiology	o/e
BIO 630/830		Recombinant DNA Techniques	c/m
BIO 632/832	[633/833]	Population Genetics	o/e
BIO 634/834	[635/835]	Developmental Genetics	c/m
BIO 635/835	[634/834]	Techniques in Molecular Biology	c/m
BIO 636/836		Molecular Biology	c/m

BIO 638/838	[672/872]	Advances in Cell Biology	c/m
BIO 640/840	[639/839]	Molecular Evolutionary Genetics	o/e
BIO 651/851	[652/852]	Advanced Research in Field Biology	o/e
BIO 653/853		Advanced Research in Field Biology	o/e
BIO 656/856	[655/855]	Environmental Physiology	o/e
BIO 670/870	[671/871]	Advances in Biology	variable, depending on topic
BIO 672/872	[673/873]	Advances in Molecular Biology	c/m
BIO 674/874		Advances in Ecology	o/e
BIO 676/876		Advances in Physiology	o/e
BIO 678/878	[675/875]	Advances in Evolution	o/e

APPENDIX F – DIRECTIONS FOR OHIOLINK SUBMISSIONS (THESES/DISSERTATIONS)

1. Go to the following website: <http://www.ohiolink.edu/etd/submit/>
2. Read through the provided information. When complete, scroll to the bottom of the page. Make sure you have selected:

I am submitting:

- ☒ My paper's bibliographic information, abstract, and full text in PDF format.

3. After you have checked the appropriate box, select the school you are submitting from (Cleveland State University)

4. You are now at the main menu. Continue to step 1 (Personal information) and enter your information. You must complete all fields marked with an asterisk. Remember to click on "Save and Continue".

5. Continue to step 2 (Information about your paper) and enter your thesis/dissertation information. You must complete all fields marked with an asterisk. There is an option to delay publication of your thesis/dissertation at the end of step 2. If you wish to delay, you must discuss this with Graduate Studies to determine the release date of your manuscript.

6. Continue to step 3 (Information about your degree) and enter your degree and advisor information. You must complete all fields marked with an asterisk.

7. Continue to step 4 (Permission and UMI publication). Choose the OhioLINK permissions that best suit your needs. There is an option to delay publication of your thesis/dissertation at this step. If you wish to delay, you must discuss this with Graduate Studies to determine the release date of your manuscript. If prior arrangements have not been made with Graduate Studies the OhioLINK submission will be denied and it can affect your degree posting. Scroll to the bottom of this page for UMI permissions.

For Doctoral students you should choose (you have already done this in paper format):

For Master's degree students, UMI publications are not required.

- ☒ Do not upload my paper to UMI. I retain the option to submit it myself at a later date.

The final step on this page is Copy Right. DO NOT choose this option. Cleveland State University will not be responsible for the \$65.fee. If you wish to Copy Right your thesis/dissertation you must do this separate from the OhioLINK submission (contact the US Copy Right Office). If you choose the Copy Right option your submission will be denied.

8. Step 5 is the submission of your document. Your document MUST be in a single file PDF format to properly upload.

9. Step 6 is the review of your submitted information.

*If you are having problems formatting your manuscript into the single file PDF format, please contact David Lodwick from the CSU Library Systems department (d.lodwick@csuohio.edu or contact him at ext. 6956). On-line information "Converting Theses & Dissertations from MS Word to PDF" can be found here: <http://www.ulib.csuohio.edu/services/thesishelp.html>

APPENDIX G—SAMPLE SEMESTER PLAN FOR JOINT JD/MS EVS*

Joint Degree Program: JD and MS in Environmental Science

Year 1		Year 2		Year 3		Year 4	
Fall Semester		Fall Semester		Fall Semester		Fall Semester	
Contracts	3	Graduate Orientation (Bio 500)	1	Evidence	4	Estates and Trusts	4
Criminal Law	3	Research Seminar (Bio 684)	1	Legal Profession	3	Criminal Procedure	3
Legal Writing	3	Environmental Law (Law 671)	3	Administrative Law	3	Thesis Project (Bio 695)	4
Property	3	MS Env. Science Elective + field lab	4	Co: MS Env. Science Elective	3	Law Elective	3
Torts	3	Constitutional Law	2.5				
		Bio 691 Thesis Research	1				
	15		12.5		16		14
Spring Semester		Spring Semester		Spring Semester		Spring Semester	
Civil Procedure 1	3	CVE 450 Environmental Technology	3	Corporations	4	Thesis Project (Bio 695/Law xxx)	1
Contracts	3	MS Env. Science Elective + field lab	4	Agency and Partnership	3	Law Elective	3
Legal Writing	2	Constitutional Law	2.5	Commercial Law	4	Law Elective	3
Property	3	Biostatistics (Bio 540)	3	Secured Transactions	3		
Torts	3						
		SUMMER Bio 691 Thesis Research	4				
	14		16.5		14		7

Law Degree Credits		MS Degree Credits	
Total Taken	11	Required MS Courses	2
	3	Elective Courses	9
		Field experience	2
		Thesis Project Credits	10
		Core Interdisciplinary Courses	
		Quantitative data methods	3
		Environmental technologies	3
		Law Courses Counted towards MS	
		Environmental Law	3
			3: part of CC

*Please consult with an advisor in law for current J.D. requirements, which are subject to change and not controlled by BGES