EVS DEGREE PROGRAMS 2011-2012

The Ph.D. Program In Environmental Sciences
The Ph.D. program in Environmental Sciences includes several "specialty areas". All students are expected to develop cross-disciplinary programs of study and complete research with a cross-disciplinary environmental science focus. The specialty areas are: Environmental Chemistry (EnCh), Environmental Biology (EnBi), Environmental Agricultural Science (EnAg), Environmental Geology (EnGe), Environmental Policy, Law, and Economics (EnPE), Environmental Materials Science (EnMa) and Environmental Engineering (EnEn). All degrees are awarded in "Environmental Science", however. Supervision of the entire graduate program is the task of the Graduate Program Committee and its chair, the Director of the Graduate Program in Environmental Sciences. Below you will find a brief summary of the overall program requirements. Further details may be obtained by consulting your Advisory Committee.

New Fall 07 Students
In the Fall 2007 and Spring 2008 the EVS program will begin an experimental core course sequence. All new students are required to take Environmental Science I (Fall), Environmental Science II (Spring) and Environmental Science III (Spring, capstone). Students participating in this core course sequence will not be required to take additional core courses.

Current EVS students
Course Requirements: Environmental Sciences has a "core" of recommended courses that are designed to provide all students with a cross-disciplinary introduction to environmental sciences. All Doctoral students are required to complete three core courses (9 credit hours, selected from the list below) with two these courses being outside of the student‘s specialty area. Students are generally responsible for the material in these courses on written or oral qualifying examinations. In addition, each student will normally take courses in their specialty area sufficient to bring the total number of credits to the minimum of 72 required for the Ph.D. in Environmental Sciences beyond the bachelor‘s degree or 42 beyond the master‘s degree. In addition to the 9 hours of core courses Doctoral students must complete two hours of topical seminar and two hours of Environmental Science seminar, 6 hours in statistics at the graduate level, 1 hour of research ethics, and 18 hours of dissertation (taken after successful completion of two qualifying exams, defense of the PhD proposal, and required courses as outlined above).

Core Courses (9 hours total; two must be from outside of your specialty area; all 3 hours, specialty area noted to right) **Environmental Geology** CHEM5053 Geochemistry (EnGe) GEOL5333 Hydrogeology (EnGe) **Environmental Chemistry** CHEM5043 Environmental Chemistry (EnCh) CHEM6144 Environmental Instrumentation (EnCh) Graduate Student Handbook 2007-2008 Revision 9/12/2007 19 **Environmental Policy & Economics** POSC6173 Environmental Policy Processes (EnPE) POSC5533 Environmental Law and Admin (EnPE) ECON6353Environmental Economics (EnPE) **Environmental Biology** ENVR6103 + ENVR6101 Environmental Systems Analysis Lecture and Laboratory (EnBi) (Note: may be used as a statistics requirement) ENVR5203 Environmental Toxicology (EnBi) ENVR6303 Case Studies in Ecosystems Management (EnBi) ESCI 6233 Population and Community Ecology (EnBi) ESCI 6333 Landscape and Ecosystem Ecology (EnBI) **Environmental Agricultural Science** ESCI 6303 Global Water Issues (EnAg) ESCI 6243 Environmental Sustainability (EnAg) Note: Additional core courses in Environmental Engineering (EnEn), Environmental Agricultural Science (EnAg) and Environmental Materials Science (EnMa) will be added over the next year.

Additional Requirements

Ethics (1 hour) ESCI7151 Responsible Conduct in Research **Seminars (2 hours of each)** ESCI7111 Environmental Science Seminar ESCI7121 Topical Seminar in Environmental Sciences **Statistics (6 hours total)** STAT6613 Nonparametric Statistics STAT6643 Multivariate Analysis STAT6653 Data Analysis I: Regression Analysis STAT6663 Data Analysis II: Analysis of Variance (ANOVA) STAT6673 Experiment Design STAT6833 Biostatistics AGRI6213 Experimental Design AGRI5233 Experimental Agricultural Statistics ENVR6103 Environmental Systems Analysis **Dissertation (18 hours)** ESCI8891-6 Dissertation Graduate Student Handbook 2007-2008 Revision 9/12/2007 20

PhD Minor In Statistics

The Ph.D. Minor in Statistics is designed to give graduate students in doctoral programs a rich foundation and core competency in statistical design and analysis skills, and to provide education and training for interested students whose doctoral research includes a substantial amount of statistical methodology or data analysis. These students will benefit from a broad and enriched perspective in the fundamentals and applications of statistics. The Minor in Statistics distinction should enhance employment opportunities for students who have an interest in a research career, be it academic or government/business oriented. The Ph.D. Minor in Statistics requires at least 12 hours of 6000-level courses with a STAT prefix. A grade of B or better must be earned in each course counted toward the minor. STAT courses which satisfy requirements of the student‘s graduate program may also count toward the Minor in Statistics. In addition to course work, students must demonstrate the ability to apply statistical methodology to problems in research. Sections or chapters of a dissertation can provide such a demonstration. Administration of the Ph.D. Minor in Statistics is through the Department of Mathematics and Statistics. A member of the statistics faculty must be on the student‘s graduate advisory committee.

Additional Course Information

If a student desires that graduate courses taken at other universities count toward the minimum number of credits for a Ph.D. in Environmental Sciences (e..g, courses taken for completion of a Master‘s degree at Arkansas State University or elsewhere), this may be requested by including the courses on the Program of Study Form. In general no more than 9 hours can be transferred in towards the MS or PhD in Environmental Sciences. In such cases the Program of Study Form should be accompanied by a recommendation from the advisory committee on the appropriateness of the proposed transfer(s) for satisfying the requirements of the Ph.D. program in Environmental Sciences. Courses which may used for graduate credit or equivalent as determined by the graduate school include all 6/7/8000-numbered courses in Environmental Sciences or related fields. Courses at the 5000 level courses, may be appropriate for specific Programs of Study. Registration for such courses should occur only after consultation with either your advisor or your advisory committee. Students who have completed 6 hours of graduate level statistics at another institution may apply these hours to their PhD Program of Study provided that the courses are approved by the graduate school and the students advisory committee. No more than a total of 9 hours can be applied towards the PhD and all must be graduate level courses. It should be noted that many students enrolled in the PhD program are simultaneously earning MS degrees in other fields such as chemistry or biology. Graduate students who are earning an MS in a field other than Environmental Sciences are held responsible for following the guidelines of the other program as well as remaining in good standing with the Graduate Program in Environmental Sciences.

Seminars: Students are expected to attend Program seminars, as well as applicable host department seminars. This experience has intrinsic value, and questions derived from presentations given in seminars sometimes occur in Qualifying and Candidacy examinations. Graduate Student Handbook

All first year students must register for ESCI7111 on a CR/NC basis. Students who do not attend the required number of seminars (approximately 75%) will fail ESCI7111. All Doctoral Students are required to earn two hours in ESCI7111. Do not register for seminar after the first year. However, graduate students should still attend as many seminars as possible as this is a critical component of professional development. All Doctoral students will deliver a seminar on their research at the end of their third year in residence, as part of an organized Program Research Symposium. Students will be provided with information about the symposium early in their third year.

Electives

New electives in the program are always being added. Students should check both the Graduate Student Bulletin as well as the EVS website for information about course offerings.

Program of Study: The Program of Study Form must be filed by the end of the first year in residence. It is generally the case that not all coursework has been completed when the form is filed and this is perfectly acceptable. Remaining courses should be identified. If there are changes in the program of study after the form has been filed, it is a simple but nonetheless necessary exercise to file a change in the Program of Study Form. In any case, students must file their Program of Study Form and qualifying examination intent form (one form used for both examinations) no later than *the end of the second semester in residence.* The form-requesting the qualifying examination should be filed with the Program of Study Form. These forms are available in the EVS Program office.

Qualifying examinations: These examinations are required by the Program, but take a variety of forms in the case of individual students. The precise requirement is determined by the student's choice of specialty area and the student's advisory committee and approved by the Director of the Graduate Program in Environmental Sciences. The goal of these examinations is to assess your preparedness for doctoral level study and assess your potential in your field. The examination may be written or oral in part or in whole. The subject(s) of the examination may include core course work and/or work relevant to your specialty area. One examination, typically oral, is taken in a core course area outside of your specialty area. The second can be oral or written in part or whole in your specialty area (administered by your advisory committee or portion thereof) or in a second non-specialty core discipline. You should consult with the administrators of these exams (generally the doctoral advisory committee) prior to taking them to ensure preparedness (FORM- Intent to take Qualifying Examinations). Possible outcomes of these examinations are (i) pass, (ii) fail with option to retake (one time only) the examination, or (iii) fail. Students who fail initially or after the second attempt will be reclassified to the MS Program and will be re-considered for the PhD Program only under extraordinary circumstances. It should be noted that there is a Program requirement that ten calendar weeks must pass before a retake of either or both of the qualifying examinations may be scheduled. These examinations must be taken prior to the end of your fourth semester in residence. (FORM – Results of Qualifying Examinations)

New students Fall 2007

Due to the unique nature of the EVS core sequence for new EVS students the 2007 cohort will not take a traditional qualifying examination. Students will take a qualifying examination at the end of the second semester of core courses (Spring 2008).

Proposal Defense: Each Ph.D. candidate must pass the oral proposal defense and associated examination. Possible outcomes of the proposal defense are i) pass, ii) fail with option to retake (one time only) the examination, or iii) fail. The oral defense of the research proposal occurs after successful completion of the qualifying examinations. *Students who have not defended their proposal by start of their fifth semester or who have not passed by the end of their fifth semester will no longer be in good standing in the PhD Program.* They will be reclassified into the M.S. program and will be reconsidered for the Ph.D. program only under extraordinary circumstances. It should be noted that there is a Program requirement that ten calendar weeks must pass before a retake of the oral proposal defense examination may be scheduled. Students who must delay taking their initial or re-take of the qualifying or proposal defense oral examination until after the specified time, due to difficulties in passing their qualifying examination or other extenuating circumstances, must submit a letter of explanation to the Director of the Graduate Program. Such explanations must contain a new proposed qualifying and/or proposal defense deadline. In all cases the oral defense of your research proposal must be passed by the last day of your seventh semester. The deadline for passing the oral proposal defense for students classified as M.S. students and later reinstated in the Ph.D. program shall be: (1) the original deadline specified in the students Program of Study or (2) 5 months after readmission to the Ph.D. program, whichever comes later. Students not passing the Ph.D. oral proposal defense by the deadline shall be reclassified to the M.S. program again and this reclassification will be final. The oral proposal defense examination may cover coursework or research topics and related areas.

Timing of Proposal Defense

Students must provide the committee with a document to review no less than 3 weeks prior to the scheduled defense date. This document must first be approved for committee review by the research advisor. Students must get approval from ALL members of the committee that the defense can take place as scheduled prior to the actual defense. Students should schedule a minimum of 3 hours for the defense (e.g., 1 hour presentation and 2 hours examination). Students must notify the Program Office of the proposal defense a minimum of 2 weeks prior to the defense (FORM – Intent to Defend Proposal).

Doctoral students, upon reaching PhD candidacy (passing both qualifying examinations, oral proposal defense and examination, and completing the PhD core course requirements) (FORM-Advancement to Candidacy) are granted an MS in Environmental Science provided that they have met the requirements above. Students who intend to earn an MS in Environmental Sciences must complete an Intent to Graduate Form in the semester that they will attain candidacy with the Graduate School.

Students, once reaching candidacy, can only under extreme conditions change advisors and only

with the permission of the Program Committee.

Dissertation: A successful Ph.D. candidate, having passed the qualifying examinations and oral proposal defense examination, must carry out original research which is described in a written dissertation, and he or she must successfully defend the completed work in a final oral examination. Detailed instructions for the preparation of the dissertation may be found on the Graduate School website. Dissertation research is expected to be original research that is publishable in a peer-reviewed setting with submission or publication prior to defense. Students must complete the PhD program requirements including successful defense of the dissertation and passing of the comprehensive examination no later than the end of the 8th year in residence of will lose all progress towards the degree.

Timing of the Dissertation Defense

Students must provide the committee with a document to review no less than 3 weeks prior to the scheduled defense date. This document must first be approved for committee review by the research advisor. Students must get approval from ALL members of the committee that the defense can take place as scheduled prior to the actual defense. Students should schedule a minimum of 3 hours for the defense (e.g., 1 hour presentation and 2 hours examination). Students must notify the Program Office of the dissertation defense a minimum of 2 weeks prior to the defense (FORM – Intent to Defend Dissertation). Students must also notify the Graduate School of the defense no less than 2 weeks prior to the defense.

Results of the dissertation defense must be reported to the Program office the day of the defense (FORM – results of the dissertation defense)

Comprehensive Examination

In most cases the comprehensive examination follows the dissertation defense (FORM – Intent to take Comprehensive Examination). This examination is given by the committee after the public portion of the defense of the dissertation. This examination can be oral or written in whole or in part. Possible outcomes of this examination is (i) pass, (ii) fail with option to retake (one time only) the examination, or (iii) fail (FORM – Results of the comprehensive examination). Students who fail initially or after the second attempt will be reclassified to the MS Program and will not be re-considered for the PhD Program. It should be noted that there is a Program requirement that ten calendar weeks must pass before a retake of the comprehensive examination may be scheduled.

Filing of Dissertation

The Graduate School requires that each final copy of any doctoral dissertation be delivered to the Graduate School with each copy containing an original separate page for the signatures of the advisory committee and Director of the Graduate Program in Environmental Sciences. The

Signature page should be bound into all copies of the dissertation as the first page in the volume, immediately preceding the title page. A minimum of three copies are required one for the Graduate School and University Library and one for the Program Office. Additional copies should be provided for the Research Advisor and student.

Dissertation Credits: As noted above PhD students are required to register for a minimum of 18 dissertation credits after attaining candidacy.