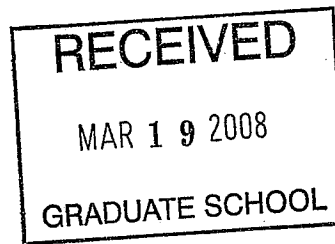




Southern
Illinois University
Carbondale



Associate Provost for Academic Affairs
www.siu.edu/~vcaap/
www.siu.edu

March 17, 2008

MEMORANDUM

TO: John Koropchak
Vice Chancellor for Research and Graduate Dean

FROM: Patricia B. Elmore *Patricia B. Elmore*
Interim Associate Provost for Academic Affairs

SUBJECT: Elimination of the Certificate in Systematic Biology and
Elimination of the Center for Systematic Biology

I am forwarding the attached Reasonable and Moderate Extension proposal to eliminate the Certificate in Systematic Biology and the Center for Systematic Biology and ask that you transmit this matter to the Graduate Council for notice and action. Please contact the program officers if you have questions.

Thank you.

Attachments

/mn

c: Don Rice
✓ David Wilson
Jay Means
Susan Ford



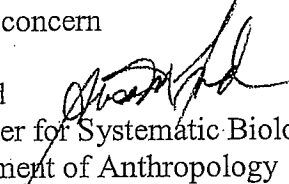
Southern
Illinois University
Carbondale

Department of Anthropology
www.siu.edu/~anthro
www.siu.edu

October 18, 2007

Memorandum

To: Whom it may concern

From: Susan M. Ford 
Director, Center for Systematic Biology
Chair, Department of Anthropology

Re: Center for Systematic Biology

Attached please find the paperwork to disband the Center for Systematic Biology (CSB). The Center was a tremendous source of interchange and interaction, and particularly served well to train and integrate students in an interdisciplinary manner. The Annual Speaker Series and Annual Systematics Symposium were particularly effective while they existed, and the three courses that were developed as part of the Certificate in Systematic Zoology (all interdisciplinary courses, including one on methods, one on curation, and a seminar) have been of benefit to a number of graduate students over the last several years.

Nonetheless, it has become clear that the lack of centralized resources and support for the director among other internal issues have made continued existence of the Center untenable. In particular, the origin of the Center for Ecology (which includes a broad overlap of membership) with considerably more resources and inherent structure has made the need for the CSB somewhat moot. With this in mind, the membership of the CSB voted unanimously in late 2006 to disband the CSB as a separate entity, and to fold into the Center for Ecology. It is the hope that the Center for Ecology will eventually be renamed the Center for Ecological and Evolutionary Biology, better reflecting this merger, and a systematist will become a member of the steering board of the Center for Ecology later this year.

In taking this (somewhat sad) action, I would note that the interdisciplinary connections between faculty and students for training and information exchange that were initially forged by the CSB continue to function. There is increased exchange of students in classes and faculty on student committees across Anthropology, Microbiology and Molecular Biology, Plant Biology, and Zoology. The interdisciplinary class on systematic methods has evolved into methods classes that are taken by students across all these departments and others. The informal, interdisciplinary systematic seminar (a one credit hour, weekly noon discussion series) continues to meet each semester and to facilitate cross-disciplinary study and communication. During its brief life, the Center for Systematic Biology did what it was intended to do, and we look forward to continued enhanced synergy between systematists across campus through the agency of the Center for Ecology (and Evolutionary Biology).

Reasonable and Moderate Extension (RME)

ELIMINATION OF CERTIFICATE IN SYSTEMATIC BIOLOGY
COLLEGE OF SCIENCE
AND
ELIMINATION OF CENTER FOR SYSTEMATIC BIOLOGY
VICE CHANCELLOR FOR RESEARCH AND GRADUATE DEAN

I. Program inventory

A. Current

<u>CIP</u>	<u>Major</u>	<u>Specialization/ Concentration</u>	<u>Degree</u>	<u>Unit</u>
26.1308	Systematic Biology		Certificate	College of Science
90.2699	Center for Systematic Biology			Vice Chancellor for Research and Graduate Dean

B. Proposed

<u>CIP</u>	<u>Major</u>	<u>Specialization/ Concentration</u>	<u>Degree</u>	<u>Unit</u>
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II. Reason for proposed action

The members of the Center for Systematic Biology voted unanimously to disband the center, and to fold its membership largely into the new Center for Ecology. With the dissolution of the Center, there will no longer be an entity to oversee the Certificate Program. In addition, the certificate proved too cumbersome an addition to existing graduate studies for students, and was not pursued.

III. Anticipated budgetary effects

None

IV. Arrangements to be made for (a) affected faculty, staff and students; and (b) affected equipment and physical facilities

None needed. All faculty are in existing academic programs. No students are currently enrolled in the certificate program.

V. Will other educational units, curricula, or degrees be affected by this action

No. There are interdisciplinary courses originally associated with the Certificate program which will remain, and will be offered from time to time to serve the needs and interests of students on campus.

VI. Any other relevant information

None.

VII. Catalog copy to be deleted or added

The description of the Center and Certificate should be deleted.

VIII. The requested effective date of implementation

Immediate.

Rev. 1.28.08



(Form 90-A)

Notice of Change of Academic Requirements
Southern Illinois University Carbondale

This form should be used for requesting changes in requirements of a degree granting unit, major, minor, concentration, specialization, certificate program and miscellaneous changes of any academic program. (See instructions)

1. This change is for: Graduate Catalog

(Please submit two forms if change relates to both graduate and undergraduate programs)

2. Name of units, department:

- a. Degree granting academic unit (College or School) Graduate School
b. Department or Division Center for Systematic Biology
c. Degree Type (BS, MS etc) Certificate
d. Major
e. Minor
f. Concentration
g. Specialization Systematic Biology

3. Brief Summary of Change (use additional page if necessary):

The Center for Systematic Biology is being disbanded and folded into the Center for Ecology. The Certificate in Systematic Biology is being discontinued.

4. Specific Changes:

If changes are editorial and minor, please make a copy of the actual catalog page(s) with corrections made on the copy and attach to this form. If changes are extensive, please type new catalog copy on white bond paper, double-spaced, outlining what you recommend for the appropriate catalog and attach to this form.

5. Effective term will be the next published catalog:

(Academic Support Programs use only).

6. Approved:

a. Departmental Executive Officer

Handwritten signature and date 10/18/07

b. Dean

_____ Date

c. Dean of the Graduate School (for graduate programs)

_____ Date

d. Associate Provost (Academic Affairs)

_____ Date

7. Academic Support Programs:

_____ Date

Carbondale, IL 62901-4612
 Telephone: (618) 453-6315
 E-mail: jaci3@siu.edu

Certificate in Medical Dosimetry

The certificate in medical dosimetry is open to post-baccalaureate students who are trained as a radiation therapist. The Medical Dosimetrist is a member of the radiation oncology (cancer treatment) team who has knowledge of the overall characteristics and clinical relevance of radiation oncology treatment machines and equipment, is cognizant of procedures commonly used in brachytherapy (treatment with radioactive sources at a close distance) and has the education and expertise necessary to generate radiation dose distributions and dose calculations in collaboration with the Medical Physicist and Radiation Oncologist. Course requirements include RAD 550-12, RAD 560-12 and RAD 570-6. These courses must be taken in sequence with each program year starting in the fall semester. Students are in the clinical/educational setting for 40 hours per week for a 12 month cycle. All classes and clinical internships take place in the St. Louis area with the majority at Barnes-Jewish Hospital.

For more information, contact:
 Scott Collins, Program Director
 School of Allied Health
 Southern Illinois University Carbondale
 Mail Code 6615
 Carbondale, IL 62901
 Telephone: (618) 453-7211
 E-Mail: kscollin@siu.edu

Certificate in Plant Ecology

The Graduate Certificate in Plant Ecology provides specialized training in plant ecology for post-bachelor level students, particularly Master's students, in both basic and applied ecology, including forestry and wildlife. The program prepares students for the Associate Ecologist Certification of the Ecological Society of America (ESA). The program requires 15 to 18 hours of coursework, 50% of which may also count toward a regular degree in some graduate program (given approval by that program and the student's advisory committee). Students must take as many courses as necessary from the following list to satisfy the ESA's sub-discipline requirements of population, community and ecosystem ecology: PLB 452a and b, PLB 545a and b, PLB 440, PLB 443, PLB 445, and PLB 444. Courses from other universities of up to two (2) courses in the list may be substituted with permission from the student's advisory committee. Students must have had in their program a minimum of two courses in statistics, including inferential statistics, or take these as deficiencies. One elective ecology course in an applied area, e.g., forestry, geography, wildlife biology, soils, is required. One-year of post-graduate experience in research or development of methods demonstrating technical competence in the application of ecological principles and/or theory to decision making is required. This research competence will be accomplished through the research experience at the Master's level. If applicants for the Certificate come into the program from industry, private consulting firms or government agencies, they will be required to take three (3) credit hours of independent research to gain this competence. A background of 12 semester hours in mathematics and physical sciences is required. Students must have a B average in graduate courses and must follow all rules of the Certification Policy established by the Graduate School. Residency must be at least 1 semester for those coming into the program just to obtain the certificate. Master's students can satisfy the residency by simply fulfilling the coursework requirements. An assessment instrument will be administered to students during the last semester of their program for final certification. An application for Associate Ecologist Certification with the ESA will be prepared and submitted on behalf of Candidates obtaining the Certificate.

For more information and detailed Certificate requirements contact:
 David J. Gibson, Coordinator, Graduate Certificate in Plant Ecology
 Department of Plant Biology
 Southern Illinois University
 Carbondale, IL 62901-6509
 Telephone: (618) 453-3231
 E-mail: dgibson@plant.siu.edu

~~Certificate in Systematic Biology~~

~~The Graduate Certificate in Systematic Biology provides specialized training in systematics, the study of the diversity of organisms and their interrelationships, for post-bachelor level students interested in any area of biology. The program requires 18 hours of special coursework, 50% of which may also count toward a regular degree in some graduate program (given approval by that program and the student's advisory committee). These hours are distributed across seven areas of training: systematic principles, taxonomic expertise, molecular techniques, curatorial and museum training, analytical and information technology in systematics, seminar and symposium in systematics, and independent study in systematic biology. In addition, students must attend or participate in the annual Systematic Biology Symposium (normally one Saturday in the spring semester), must attend or participate in at least one national or regional meeting associated with the field of~~

systematic biology, and must deliver orally and deposit one written copy of an individual systematic study of a particular taxonomic group.

For more information, contact:

Susan M. Ford, Coordinator, Graduate Certificate in Systematic Biology
Department of Anthropology
Southern Illinois University
Carbondale, IL 62901-4502
Telephone: (618) 453-5013

Certificate in Women's Studies

The purpose of the Women's Studies certificate is to meet the demand for formal recognition of graduate level Women's Studies academic preparation.; enhance preparation for job opportunities with Women's Studies credentials; enhance and broaden the perspectives of graduate students from various related fields; and serve interested community members and /or spouses or partners of national/international students not pursuing a graduate degree, but interested in the specialty area of Women's Studies. The program requires 18 hours of coursework and independent study. This includes nine hours of required coursework (PSYC 550, SPCM 515, SOC 544) and nine hours of electives, including three hours of independent graduate readings. The student must be currently enrolled in a graduate degree program at SIUC or an individual holding a bachelor's degree and admitted to the Graduate School (non-declared).

For more information, contact:

Women's Studies Director
Department of Women's Studies
Southern Illinois University
Carbondale, IL 62901-6518
Telephone: (618) 453-5141
E-mail: joanmcd@siu.edu

Certificate in Systematic Biology

The Department of Anthropology participates in the Certificate in Systematic Biology interdisciplinary program and offers three classes, ANTH 554 Systematic Biology Seminar, ANTH 555 Curation of Biological Collections, and ANTH 556 Computer Techniques in Systematic Biology, which are Certificate requirements. For more information on the Certificate program, please see the section on Graduate Degrees Offered in Chapter 1.

Courses (ANTH)

404-3 Art and Technology in Anthropology. An introduction to the basic ways in which people utilize the natural resources of their habitat to meet various needs, such as food, shelter, transportation and artistic expression. The nature of art, its locus in culture and its integration into technical society will be considered.

405-3 How to Do Anthropological Research. This course is designed to teach students the skills needed to consume the professional literature of anthropology intelligently. The subjects covered include: the importance of research questions or hypotheses, the logic of deducing test implications, literature search, sampling, measurement issues, data reduction and graphing and simple inferential statistics.

406-3 Introduction to Historical Linguistics. (Same as Linguistics 406) An introductory survey of historical and comparative linguistics, including terminology, assumptions and methods of investigation. Satisfies the CoLA Writing-Across-the-Curriculum requirement. Prerequisite: Linguistics 405 or consent of instructor.

410A-3 Practicing Anthropology. This course is designed to get students acquainted with the notion of development and the challenges that the practice of anthropology faces when directed towards development and social change in both developing and developed countries. Prerequisite: 300d recommended for undergraduates.

410C-3 Economic Anthropology. The study of non-Western economic systems. Prerequisite: none. 300d recommended for undergraduates.

0410E-3 Anthropology of Law. Anthropological thought on imperative norms, morality, social control, conflict resolution and justice in the context of particular societies, preliterate and civilized. Law of selected societies is compared to illustrate important varieties. Prerequisite: none. 300d recommended for undergraduates.

410F-3 Anthropology of Religion. A comparative study of (religious) belief systems, with emphasis upon those of non-literate societies. Examination of basic premises and elements of these belief systems, normally excluded from discussions of "Great Religions". Prerequisite: none. 300d recommended for undergraduates.

410J-3 Kinship and Social Organization. Universal features of non-Western systems of kinship terminology and social organization. Topics include the structure and functioning of kinship systems, lineages, clans, sibs, phratries, moieties and tribal units. Prerequisite: none. 300d recommended for undergraduates.

410K-3 Ecological Anthropology. An examination of the relationship of past and present human populations in the context of their natural and social environments. Prerequisite: 300c and 300d or equivalent.

410L-3 Transcending Gender. How do humans become male and female in different societies? Can men become women and women become men? What other gender possibilities exist? Is male dominance universal? What are the sources of male and female power and resistance? Do women have a separate culture? What is the relationship between gender, militarism and war? These and other questions will be examined in cross-cultural perspective. Prerequisite: 300d recommended for undergraduates.

410M-3 Healing and Culture. This course examines systems of healing and medicine from an anthropological perspective. The theory and practice of medicine in different cultures, including Western biomedicine, are considered. Particular attention is given to the ways, in which medical knowledge gains legitimacy in different social contexts and the problems, which arise in culturally heterogeneous arenas when different medical paradigms contend for legitimization. Prerequisite: 300d of consent of instructor.

410N-3 Anthropology of Popular Culture. An examination of recent approaches to popular culture, material culture and consumption in anthropology. Special topical focus will include sports, television and movies, food and shopping. The course will be organized around several fieldwork projects in the Carbondale community. Prerequisite: 300d recommended for undergraduates.

410O-3 Colonialism and Post-Colonialism. This course is designed to familiarize students with the experience of colonialism and the political, social, cultural implications of it. The analysis will not be limited to the study of the colonial period, but it will examine the complexities of contemporary post-colonial societies and cultures.

410P-3 Ethics and Research. This course examines the risks that any anthropological research poses, both in fieldwork and writing, as well as the questions and dilemmas that any social scientist should be aware of before getting involved in any research practice. Prerequisite: 300d recommended for undergraduates.

412-3 Visual Anthropology as a Research Methodology. The new digital technologies provide exciting new ways to conduct anthropological research and present research findings. They also raise technical, methodological and ethical questions for researchers. This course examines these issues through readings and analysis of examples of use of these media-digital video, still photography, and web authoring – in the field and in presentation to a scholarly and larger public.

415-3 Sociolinguistics. (Same as Linguistics 415) History, methodology and future prospects in the study of social dialectology, linguistic geography, multilingualism, languages in contact, pidgin and creole languages, and language planning. Prerequisite: one previous course in linguistics or consent of instructor.

417-3 Language Contact. This course will introduce students to the social conditions under which language contact occurs and the cultural and linguistic consequences of such contact. Primary topics will be language maintenance and shift, ideologies and attitudes regarding bilingualism, and language development and change,

Thesis option M.S. students must take two courses and the doctoral students must take three courses from a list of approved courses for specialization. Only one 400-level course from this list can be used to meet this requirement. Currently this list consists of MBMB 403, 405, 421, 423, 425, 444, 453, 455, 456, 470, 520, 530, 531, 532, 533, 543, 551, 552, 553, 560, and 562. These courses are selected with the approval of the student's graduate committee, Research Director or the Departmental Graduate Advisor. In addition, M.S. students are also required to earn at least 8 hours in research and thesis credit (MBMB 515, 598 and 599; a minimum of 3 and maximum of 6 hours for MBMB 599), prepare a thesis on the research project and pass a final oral examination, which serves as the comprehensive examination.

The formal course requirements for non-thesis option M.S. students with an area of specialization in public health laboratory sciences can be met by taking MBMB 403 or MBMB 405, MBMB 453 or MBMB 455, MBMB 451a, MBMB 451b, CHEM 431, MBMB 460, MBMB 510, MBMB 540, MBMB 541a and MBMB 541b. Non-thesis option M.S. students must also take 1 hour of MBMB 597 (Seminar and Professional Training) during each semester in residence. The Public Health Science Program Committee will make recommendations to the Program Director whether courses taken at SIUC or other universities are equivalent to the program requirements.

Preliminary Examination and Dissertation for the Ph.D. Degree. Each student in the doctoral program must pass a preliminary examination and meet the Graduate School residency requirement before being advanced to candidacy. The students can take the preliminary examination after completing the formal course requirements.

The student's graduate committee will prepare and administer a written preliminary examination covering various areas of molecular biology, microbiology and biochemistry, with particular emphasis in the area of concentration declared. This declaration will be done by means of a prospectus of a dissertation composed of (1) a proposal for the dissertation research, (2) biographical information on the candidate, and (3) a list of the courses taken during the candidate's graduate program. The proposal should address the proposed graduate research project, and be written in the NIH (National Institutes of Health) or NSF (National Science Foundation) approved format. The prospectus shall be available to the committee members at least 14 days prior to the date of the examination.

A written examination score of at least 80% is required before a student can proceed to the oral portion of the preliminary examination. Upon satisfactory completion of the written examination, the candidate will meet with the committee as a whole and discuss the prospectus in detail. The committee will then conduct an oral preliminary examination. At this time, the committee may ask in-depth questions about the research project and other areas of molecular biology, microbiology and biochemistry. At least 4 of the 5 committee members must judge the oral performance acceptable for a student to pass the preliminary examination overall. In the event that either the written or oral preliminary examination is failed, a student may request only one re-examination.

Successful completion of both written and oral examinations is required before a student can be advanced to candidacy for the Ph.D. After admission to candidacy, the student must earn at least 24 dissertation credit hours (MBMB 600), prepare and defend a dissertation, and present a public seminar based on the student's research.

Certificate in Systematic Biology

The MBMB program participates in the Certificate in Systematic Biology interdisciplinary program and offers three classes, MBMB 554 Systematic Biology Seminar, ANTH 555 or PLB 555 or ZOOL 555 Curation of Biological Collections, and MBMB 556 Computer Techniques in Systematic Biology, which are certificate requirements. For more information on the Certificate program, please see section on Graduate Degrees Offered in Chapter 1.

Courses (MBMB)

403-3 Medical Microbiology Lecture. (Same as Microbiology 403) A survey of the more common bacterial, mycotic and viral infections of humans with particular emphasis on the distinctive properties, pathogenic mechanisms, epidemiology, immunology, diagnosis and control of disease-causing microorganisms. Three hours lecture. Spring semester. Prerequisite: Microbiology 301; or consent of instructor.

405-3 Clinical Microbiology. (Same as Microbiology 405) (This course will be offered in Springfield only). A comprehensive course for health science professionals covering the biology, virulence mechanisms and identification of infectious agents important in human disease and host-defense mechanisms. Clinical applications are emphasized. Three hours lecture. Prerequisite: Microbiology 301; or consent of instructor.

421-3 Biotechnology. (Same as Microbiology 421) Topics covered will include the genetic basis of the revolution in biotechnology, medical applications including genetic screening and therapeutic agents, industrial biotechnology and fermentation, and agricultural applications. Three hours lecture. Prerequisite: Microbiology 302; or consent of instructor.

423-3 Geomicrobiology. (Same as Microbiology 423 and Geology 423) The course will focus on the role that microorganisms play in fundamental geological processes. Topics will include an outline of the present understanding of microbial involvement of weathering of rocks, formation and transformation of soils and

more than 30 working days from the completion date of the written examination. The Chair will not participate in the questioning of the student and does not have a vote regarding the proceedings. The oral preliminary examination must be announced at least 10 working days before the examination is to be given. The examination may only be scheduled when classes are in session, including finals week. The examination shall last at least two hours and not more than four hours and should be scheduled to allow attendance of a maximum number of faculty members from the student's department and all of the preliminary examination committee members. The student's answers to the written examination will be made available to the graduate faculty (upon request) before the oral part of the preliminary examination. All attending graduate faculty members will be given the opportunity to express their opinion on the examination. A vote on performance in the oral examination must be taken immediately following completion of the examination. A pass requires a vote with no more than one dissenting member of the preliminary examination committee, and may have conditions. If the vote is pass, then two levels may be recognized: Pass and Pass with Distinction. A student will be allowed two attempts to pass the oral preliminary examination. Should a student fail a second attempt to pass the preliminary examination, he/she will be dropped from the program. Doctoral students entering the program with a master's degree must take the preliminary exam by the end of 30 months and must pass the preliminary examination and be admitted to candidacy by the end of 36 calendar months after first registering in the doctoral program.

Final Examination (Dissertation Defense). The final examination will be oral. It must be preceded during that semester by a public seminar on the student's research findings. The student's advisory committee will notify the Director of Graduate Studies of its recommendation for the date of the final examination at least two weeks prior to the seminar. The seminar and examination must be announced at least 10 working days before the seminar and examination. The seminar and examination must be held when classes are in session, including finals week. The final examination shall last for no more than 3 hours. It is to cover the dissertation and related subject matter. Passage of the final oral examination should be construed to mean there shall be no more than one dissenting vote of the advisory committee. Should a student fail a second attempt to pass the final examination, she/he will be dropped from the program.

Certificate in Plant Ecology

The Department of Plant Biology participates in the Certificate in Plant Ecology to prepare candidates for the Ecological Society of America's Associate Ecologist Certification. For more information on the Certificate program, please see the section on Certificate Programs in Chapter 1.

Certificate in Systematic Biology

The Department of Plant Biology participates in the Certificate in Systematic Biology interdisciplinary program and offers two classes, PLB 554 Systematic Biology Seminar and PLB 556 Computer Techniques in Systematic Biology, which are Certificate requirements. For more information on the Certificate program, please see the section on Certificate Programs in Chapter 1.

Courses (PLB)

For all field courses in plant biology, students will be assessed a transportation fee. In addition, certain courses may require the purchase of additional materials and supplies, generally \$1 to \$5 in total cost.

400-4 Plant Anatomy. An introduction to the differentiation, diversification and structure of plant tissues and organs, with emphasis on the organization of seed plants. Laboratory will include instruction in the techniques of microscopy used in the study of plant structure. Two lectures and two laboratories per week. Lab fee: \$15. Prerequisite: Biology 200b or Plant Biology 200.

404-4 The Algae. A phylogenetic approach to the study of algae with emphasis on comparative cytology, morphology and ecology. Laboratories include a detailed survey of freshwater algae and a general treatment of representative marine forms. Two lectures and two two-hour laboratories per week. Prerequisite: 204 or consent of instructor.

405-4 The Fungi. A survey of the fungi — their structure, development, relationships, ecological roles and economic importance. Two lectures and two laboratories. Lab fee: \$15. Prerequisite: Biology 200b or Plant Biology 200 or equivalent; Plant Biology 300 or equivalent recommended.

406-3 Bryology. An introduction to the biology of mosses, liverworts, and hornworts, with emphasis on structure, development, and phylogeny, but also including the study of their genetics, biochemistry, and physiology. Two lectures and one laboratory per week. Lab fee: \$15. Prerequisite: 300.

409-3 Field Mycology. The taxonomy, ecology, and distribution of fungi in southern Illinois and environs with emphasis on techniques of specimen collection, preservation, identification, and recognition. This is a field-based course wherein field trips are made most weeks. Also microscopic examination of living specimens is required. Lab fees are needed for travel and microscope supplies. Prerequisite: Biology 200b or Plant Biology 200; Plant Biology 300 recommended.

410-4 Ecology of Bryophytes. A field-based focus on learning identification of the local flora. Interactions of bryophytes to their environment are examined through lectures, laboratories, and field study. Importance of

- A thesis embodying results and analysis of original research and a final examination are required.

Final Examination.

- Each candidate for a master's degree is required to pass a final examination. The examination will be oral and should be taken no later than 4 weeks before graduation.
- The examination consists of 2 parts:
 - Presentation of the results of the research in a seminar.
 - A closed session of inquiry by the student's advisory and research committee following the seminar.

Graduation. Candidates for a master's degree must follow and fulfill all Graduate School procedures and requirements for processing one's application for graduation.

The Ph.D. Degree

Graduate study and research in the Department of Zoology is organized around three broad, overlapping areas in the life sciences: animal diversity; ecology and environmental science; and genetics, molecular and cell biology. Entering doctoral students are expected to take (or have taken) at least eight courses: three courses from each of any two areas and two courses from the third.

There is no minimal credit-hour requirement beyond the Graduate School's residency and dissertation hour requirements. A student in consultation with an adviser prepares a program of study including courses in the major, in the minor, in areas of deficiency, and to complete the research tool requirement. This program when approved by the student's advisory and research committee is filed with the director of graduate studies in zoology.

Acceptable tools include foreign language, statistics, computer science, mathematics, biochemistry, and biotechnology. Normally two tools are required; however, one tool with exceptional expertise may satisfy the requirement if approved by the student's committee (exception: English as a second language). A student may qualify in a foreign language by completion of FL 488 with a grade of *A* or *B* or a score of at least 465 on the ETS proficiency exam. To qualify in statistics, a student must have at least two semesters of course work approved by the advisory committee. In computer science a student should take CS 200 and one of the following: 129, 215, 220, and 470. For the tool requirements in mathematics, biochemistry, and biotechnology, the student will arrange a program of 2 or 3 courses acceptable to the advisory committee. Previously acquired skills or knowledge may satisfy the tool requirement if the student passes an appropriate proficiency examination.

A 3.25 grade point average in graduate level course work must be maintained; failure to meet this requirement will result in loss of any financial support provided by the department. No course in which the grade is below *C* is acceptable for credit.

Preliminary Examinations. These examinations (oral and written) are taken after the tool requirement and a major portion (approximately 80 percent) of formal course work are completed, usually at the end of the second year of graduate study. The student with the approval of the adviser, advisory committee, and the director of graduate studies in zoology registers with the chair of the preliminary examination committee to take the examination. The written and oral examinations emphasize competence in the areas of specialization.

Dissertation. The nature of the research to be used for the dissertation is established in consultation with the student's adviser, and is approved by the advisory and research committee. An approved copy of the research proposal is filed with the director of graduate studies in zoology. The student is required to register for a minimum of 24 semester hours in ZOOL 600, Dissertation Research. The dissertation is evaluated by the student's advisory and research committee, reviewed for approval by the chair and submitted to the graduate dean for final approval.

Final Examination. Upon approval of the dissertation by the student's advisory and research committee, the candidate requests the director of graduate studies in zoology to schedule a seminar and a final examination. Following the seminar, the final examination over the dissertation is conducted by the student's committee.

Graduation. Candidates for a Ph.D. degree must follow and fulfill all Graduate School procedures and requirements for processing one's application for graduation.

Certificate in Systematic Biology

The Department of Zoology participates in the Certificate in Systematic Biology interdisciplinary program and offers three classes, ZOOL 554 Systematic Biology Seminar, ZOOL 555 Curation of Biological Collections, and ZOOL 556 Computer Techniques in Systematic Biology, which are Certificate requirements. For more information on the Certificate program please see the section on Graduate Degrees Offered in Chapter 1.

Courses (ZOOL)

Students enrolled in zoology courses may incur field trip or laboratory expenses of \$5 to \$25.