

1/8/09



COVER SHEET FOR GRADUATE CURRICULUM PROPOSALS

All curriculum proposals should be sent to the Graduate School office for review and distribution. Information items will be handled administratively and require the "Cover Sheet for Graduate Information Items." New curriculum proposals and substantive curriculum changes require the action of both Graduate Council and the Executive Committee of the Faculty Senate and use this cover sheet. When all signatures have been obtained, the Graduate School will notify the originator of the proposal that it has been sent to the Graduate Council curriculum committee.

Originator: Margaret J. Kovach Date: October 2, 2008

Title of Proposal: Name Change and Modification of Course Description and prerequisites for ESC 533 Deactivate ESC 533 and new course proposed
Proposed Starting Date: Spring 2009

533 ESC XXX Environmental and Ecological Genetics

REVIEWED BY:

<u>John [Signature]</u>	<u>10/10/08</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Department Head	Date	approve	neutral	disapprove*
<u>[Signature]</u>	<u>10/10/08</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dean of the Academic College	Date	approve	neutral	disapprove*
<u>Gyenne Kelpatue</u>	<u>11/14/08</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Director, The Graduate School	Date	approve	neutral	disapprove*
<u>[Signature]</u>	<u>11/14/08</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dean, The Graduate School	Date	approve	neutral	disapprove*
<u>[Signature]</u>	<u>11-17-08</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
University Registrar	Date	approve	neutral	disapprove*

REVIEWED BY OTHER UNITS AFFECTED:

Reviewer	Date	approve	neutral	disapprove*
Reviewer	Date	approve	neutral	disapprove*
Reviewer	Date	approve	neutral	disapprove*

* Those who disapprove must attach an explanation.

SUMMARY OF ACTION BY GRADUATE COUNCIL

- Approved as submitted
- Approved with amendments (amendments indicated and transmitted to originator to revise and submit electronically for Executive Committee of the Faculty Senate)
- Reviewed by the Provost [Signature] 1/20/09
Provost's signature Date approve disapprove*
- Forwarded to Executive Committee of the Faculty Senate
- Graduate Council Chair [Signature] 1-8-09
Graduate Council Chair's signature Date

SUMMARY OF ACTION BY EXECUTIVE COMMITTEE OF THE FACULTY SENATE

- Approved as submitted
- Referred to Faculty Senate for action. [Signature] 1-15-09
President, Faculty Senate Date

1/28/09 Date sent to Originator

1/28/09 Date sent to University Registrar

09-0011G Revised

Department of Biological and Environmental Science
Curriculum Proposal to deactivate ESC 533 and propose a
new course as a replacement

The department of Biological and Environmental Science seeks to deactivate a current course and replace it with a course with a more accurate course description for the material and more closely reflect the pedagogical intent.

Rationale:

This proposal request to deactivate ESC 533 and replace it with a new course (ESC xxx) is a result of the faculty determination that the current course description is too general and does not reflect the learning objectives of the course. Moreover the new course will require a prerequisite. Graduate students in the Environmental Science MS program often enter with a variety of academic backgrounds. The inclusion of a prerequisite for a new course will help ensure that all students are operating from a common knowledge base.

Affect of proposal on other programs:

This proposal is not expected to have any impact on programs outside of Environmental Science.

Impact:

None expected; deactivating one course and adding a separate course causes no net change in the course offering of the department. The faculty who now teach the course are happy to have a catalog course description that reflects the purpose of the course. There should not be a financial cost to this university for this change.

Catalog Changes:

Current graduate catalog (p. 120)

533 Environmental Genetics (3 credits) DEACTIVATE

Applications of genetic concepts in three major areas: population genetics, molecular analysis, and management decisions. Includes case studies in application of genetics.

xxx Environmental and Ecological Genetics (3 credits)

This course integrates ecology, genetics, and evolutionary biology with emphasis on applications of genetic concepts in three major areas: molecular analysis, developmental and population genetics. Contemporary approaches to studying evolution in natural populations will be presented, including analyzing heritability of ecologically important traits, using molecular techniques to determine genotypes, evaluating the affect of environmental agents on the genetics and development of organisms, and using models to predict evolution in natural populations. Includes case studies and journal readings to examine evolutionary effects of ecological interactions among organisms. *Prerequisites: Instructor approval.*

Model Syllabus: attached

Effective date: Fall 2009

SYLLABUS
ENVIRONMENTAL AND ECOLOGICAL GENETICS
(ESC 533/ESC 4XX/BIOL 4XX)

Instructors:

Dr. Margaret Kovach
Office: 121 Holt Hall
Office Hours: MWF 9:00AM – 10:00AM; TU 2:00PM-3:00PM
Office Phone: 425-4397
e-mail: margaret-kovach@utc.edu

Dr. Ethan Carver
Office: 227 Holt Hall
Office Hours: M-F 10:00AM-11:00AM
Office Phone: 425-4315
e-mail: ethan-carver@utc.edu

Dr. Joey Shaw
Office: 113 Holt Hall; Lab: 115 Holt Hall
Office Hours: M-F 10:00AM – 11:00AM
Office Phone: 425-4265
e-mail: joey-shaw@utc.edu

Pre-requisites: Instructor approval

Course Description:

This course will cover the fundamentals of modern ecological, evolutionary and environmental genetics. The class has a lecture component as well as weekly meetings to discuss papers published in the primary research literature. The course begins with an overview of inheritance, molecular biology and genetic variation, its measurement, and the forces responsible for the origin and maintenance of variation. The remainder of the course describes the ecological and evolutionary forces that shape genetic variation within and between species and how knowledge of genetics can be applied to ecological and environmental studies. Emphasis will be placed on experimental studies of natural populations, and the relationship between theory and experiments. Examples of possible topics will include: heritability and how the heritability of traits is measured, sources of genetic variation, the biological impact of environmental toxins, the genetic structure of populations and genetic drift, models of gene flow, effects of selection on gene frequencies. In each of the section, the students are introduced to basic tools, methods and applications of the subject area, as well as to contemporary research problems with examples from literature and current research.

Course Objective:

The overall objective of this course is to obtain a general understanding of the relationships between genes and the environment. Specifically this course will introduce students to population and evolutionary genetic concepts in experimentally applied frameworks. As a result of this course the student should gain an understanding of methods for measuring genetic

variation; a basic theoretical grasp of describing the distribution of population genetic variation; an understanding of the roles of mutation, gene flow, population size, selection and recombination, and how these factors interact to influence evolution; an understanding of molecular evolution and basic phylogenetic analysis; an understanding of the genetic basis of continuous traits, including the roles of genetics, environment, and their interactions.

Attendance Policy:

You will be evaluated on your participation in lecture and group discussions. If missing class is unavoidable, please contact the instructor(s) prior to the absence in order to make arrangements to accommodate missed material.

Tentative grading scheme:

Three semester examinations will be given (100 pts each) – one by Kovach, Carver and Shaw, respectively. Graduate students enrolled in the course will have the responsibility of leading the discussion for a chosen topic(s) by providing a PowerPoint presentation on background information and a written review of the topic. The review will be a written review (as if you are reviewing the paper for its publication) and the discussion will come from your leading the class discussion on that day.

Your review should be no more than 5 pages and organized as follows*:

- 1) provide a brief introduction to the topic, including assigned papers (with some background information)
- 2) state the objectives of the studies and how they relate (ie are important) to the general field of study.
- 3) generally describe the methods used and evaluate the suitability of these methods to the project (suggest better approaches if possible)
- 4) describe the results and the author's interpretation of those results and their significance as a contribution to the topic in general.
- 5) identify the goals of the paper and evaluate whether these goals have been met by the study.

*see attached appendix for detailed format of written reviews.

ALL students (graduate and undergraduate) are required to read each article and participate in the discussion of the papers chosen (by instructors) as part of the reading material for this course. The content of each term exam will not be comprehensive but rather cover all new material given since the previous exam.

Grading

Exam I	100 pts	90%-100%	= A	(315-350 pts)
Exam II	100 pts	80%-89%	= B	(280-314 pts)
Exam III	100 pts	70%-79%	= C	(245-279 pts)
Case Studies (G)	50 pts	60%-69%	= D	(210-244 pts)
<u>Participation (UG)</u>	<u>50 pts</u>	< 60%	= F	(< 244 pts)
TOTAL*	350 pts			

* G = Graduate students

*UG = Undergraduate students

Check your UTC email address (firstname-lastname@utc.edu) for all communications. (See <http://onenet.utc.edu> for your exact address.) Please check your UTC email on a regular basis. If you have problems with accessing your email account, contact the Help Desk at 423/425-2678.

Disabilities: If you are a student with a disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) and think you might need special assistance or a special accommodation in this class or any other class, please speak with your professor as soon as possible. You may also contact the UTC Office for Students with Disabilities at 425-4006 or go by their office in 110 Frist Hall on the UTC campus.

Counseling and Career Planning Center: If you find that personal problems, career indecision, study and time management difficulties, etc. are adversely impacting your successful progress at UTC, please contact the Counseling and Career Planning Center at 425-4438.

ESC 533/ESC 4XX/BIOL 4XX Tentative Course Schedule:

MOLECULAR ANALYSIS OF POPULATIONS:

WEEK 1: Transmission Genetics and Inheritance

WEEK 2: Central Dogma of Molecular Biology, Genome Variation and Mutation

WEEK 3: (Case Studies - Papers to read, review, and discuss)

WEEK 4: (Case Studies - Papers to read, review, and discuss)

WEEK 5: Test I

TERATOGENIC EFFECT OF ENVIRONMENTAL AGENTS:

WEEK 6: Developmental Genetics and Cellular Signaling

WEEK 7: (Case Studies - Papers to read, review, and discuss)

WEEK 8: (Case Studies - Papers to read, review, and discuss)

WEEK 9: (Case Studies - Papers to read, review, and discuss)

WEEK 10: Exam II

POPULATION AND EVOLUTIONARY GENETICS:

WEEK 11: Geographical Genetic Variation, Phylogeny/Phylogeography/Population Genetics

SPRING BREAK

WEEK 12: (Case Studies - Papers to read, review, and discuss)

WEEK 13: (Case Studies - Papers to read, review, and discuss)

WEEK 14: (Case Studies - Papers to read, review, and discuss)

WEEK 15: Exam III