George Mason University
Graduate Course Approval/Inventory Form

Please complete this form and attach a copy of the syllabus for new courses. Forward it as an email attachment to the Secretary of the Graduate Council. A printed copy of the form with signatures should be brought to the Graduate Council Meeting. Complete the Coordinator Form on page 2, if changes in this course will affect other units.

Please indicate:  ___X__ NEW  ____ MODIFY  ____ DELETE

Local Unit:  Environmental Science & Policy  Graduate Council Approval Date:

Course Abbreviation:  EVPP  Course Number:  515

Full Course Title:  Molecular Environmental Biology I

Abbreviated Course Title (24 characters max.):  MOLECULAR ENVIRON BIOL I

Credit hours:  3  Program of Record:  Environmental Science and Policy

Repeatable for Credit?  ___ D=Yes, not within same term  Up to hours
                      ___ T=Yes, within the same term  Up to  hours
                      ___ N=Cannot be repeated for credit

Activity Code (please indicate):  _X__ Lecture (LEC)  ___ Lab (LAB)  ___ Recitation (RCT)
                                 ___ Studio (STU)  ___ Internship (INT)  ___ Independent Study (IND)  ___ Seminar (SEM)

Catalog Credit Format  3 : 3 : 0  Course Level:  GF(500-600)  ___ X  GA(700+)  ____

Maximum Enrollment:  20  For NEW courses, first term to be offered:  Fall 2004

Prerequisites or corequisites:  Introductory biology and genetics or permission of instructor.

Catalog Description (35 words or less)  Please use catalog format and attach a copy of the syllabus for new courses.:  Introduction to molecular environmental biology covering basic concepts of molecular biology, molecular evolution, and bioinformatics, and their application to problems in molecular and environmental biology.

For MODIFIED or DELETED courses as appropriate:

Last term offered:  Previous Course Abbreviation:  Previous number:

Description of modification:

APPROVAL SIGNATURES:
Submitted by:  ________________________________  email:  ________________

Department/Program:  ________________________________  Date:  ________________

College Committee:  ________________________________  Date:  ________________

Graduate Council Representative:  ________________________________  Date:  ________________
Approval from other units: NONE

Please list those units outside of your own who may be affected by this new, modified, or deleted course. Each of these units must approve this change prior to its being submitted to the Graduate Council for approval.

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Graduate Council approval: _____________________________ Date: __________

Graduate Council representative: __________________________ Date: __________

Provost Office representative: __________________________ Date: __________
Molecular Environmental Biology I
EVPP 515

Instructor: Pat Gillevet
Associate Professor
Environmental Science and Policy
George Mason University, MSN 4E3,
Manassas, VA 20100
703-993-1057
pgilleve@gmu.edu

Office hours: TBA

Description:
An introduction to molecular environmental biology covering basic concepts of molecular biology, molecular evolution, and bioinformatics, and their application to problems in molecular environmental biology.

Course Goals:
The goal of the course is to equip the student with the basic fundamentals of Molecular Environmental Biology so they can read and understand the current literature in Molecular Evolution, Conservation Genetics, Genomics, and Biocomplexity.

Prerequisites: Introductory biology and genetics or permission of the instructor.

Course Textbooks and Materials:
• Molecular Cell Biology, Lodish et al, W.H. Freeman and Company, 1999
• Other reading will be assigned from the literature and from the Web.

Credits: This course carries 3 credits.

Grading:
• Grades will be based on class interaction (10%), four homework assignments (60%), a presentation (15%), and a final written project (15%).
• Final Project will be a critique on a current paper of interest in Molecular Environmental Biology.
• Class interaction will be measured by participation in class meetings and by participation in on-line discussions.

Honor Code: Students may discuss homework assignments with others, but you must turn in your own work.

Methods of Instruction: This course will be delivered primarily in a lecture format with student presentations in the last week.

Computer resources:
• You will need to have access to email and the web to access assignments.
• All of these resources are available to GMU students at the Fairfax campus and elsewhere.
• You may also need to read WWW documents in *.pdf (Adobe Acrobat) format or *.ps (Postscript) format.
Readers are available for free for Windows, Macintosh and many unix platforms at the Adobe website and Ghostscript/Univ. of Wisconsin CS Dept.

Schedule:

- TBA

COURSE OUTLINE

Molecular Biology Basics

Lecture 1:
- Introduction to Molecular Environmental Biology
- Eukaryotic and Prokaryotic Cell
- Introduction to WEBCT
- Readings: Chapter 1 in Lodish

Lecture 2:
- Chemical Foundations
- Readings: Chapter 2 in Lodish

Lecture 3:
- Proteins
- Readings: Chapter 3 in Lodish

Lecture 4:
- Nucleic Acids
- Readings: Chapter 4 in Lodish

Lecture 5:
- Recombinant DNA I
- Readings: Chapter 7 in Lodish

Lecture 6:
- Recombinant DNA II
- Readings: Chapter 7 in Lodish

Lecture 7:
- PCR
- Readings: Chapter 7 in Lodish

Lecture 8:
- DNA Sequencing
- Readings: Chapter 7 in Lodish
- Homework 1
Bioinformatics

Lecture 9:
- Web Based Resources
- Sequence Alignment
- Readings: Sequencher manual

Lecture 10:
- Phylogenetic Analysis
- Readings: assigned papers
- Homework 2

Molecular Environmental Biology

Lecture 11:
- Bacterial Systematics
- Readings: assigned papers
- Homework 3

Lecture 12:
- Phylogeography
- Readings: assigned papers

Lecture 13:
- Conservation genetics
- Readings: assigned papers
- Homework 4

Lecture 14:
- Ecogenomics
- Readings: assigned papers
- Student Presentations