Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
Submit original form and 2 copies. Attach a course syllabus to each.

1. This request is submitted by the Department of Wildlife & Fisheries Sciences

2. Course prefix, number and complete title: GENE 648 - Molecular Evolution

3. Course description (not more than 50 words): Theory and tools used in the analysis of molecular evolutionary patterns of DNA and protein sequences; format combines lecture presentations by instructor, discussion of relevant scientific literature, computer exercises, preparation of research proposal or independent research project, and practice in peer-review process.

4. Prerequisite(s): Basic courses in general Genetics and Evolution. Cross-listed with WFSC 648. Cross-listed courses require the signatures of both department heads.

5. Is this a variable credit course? □ Yes □ No If yes, from _____ to _____.

6. Is this a repeatable course? □ Yes □ No If yes, this course may be taken _____ times. Will the course be repeated within the same semester/term? □ Yes □ No

7. Has this course been taught as a 489/689? □ Yes □ No If yes, how many times? 1 Indicate the number of students enrolled for each academic period it was taught: fall 2008 - 6 students

8. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)

   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

PhD & MS in WFSC, PhD & MS in GENE, PhD & MS in BIOL

9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

10. Prefix: GENE, Course #: 648, Title (exclude punctuation): Molecular Evolution

    Lect. Lab SCH Subject Matter Content Code Admin. Unit Acad. Year FICE Code
    0 2 0 1 0 3 2 6 1 3 0 3 0 0 2 0 4 2 0 0 9 - 1 0 0 3 6 3 2

Do not complete shaded area.

Approval recommended by:

James R. Wild
Head of Department
08/05/02

David L. Lacey
Head of Department (if cross-listed course)
01/01/02

Donald W. Lacey
Chief, College Review Committee
01/27/02

Brian W. Lacey
Dean of College
11/15/02

Submitted to Coordinating Board by:

Dean of College
11/15/08

Director of Academic Support Services

Date

Effective Date

To have this form reviewed, please send to Linda F. Lacey, Mail Stop 1265 or fax to 847-8737.
OAR/AS-504

1 of 6 C6
WFSC/GENE 648  
Molecular Evolution  
Fall 2008  

Course Syllabus

Instructor:
Dr. Mariana Mateos  
Dept. of Wildlife and Fisheries Sciences  
979-847-9462  
mmateos@tamu.edu  
Office Hours at 320B Old Herman Heep Bldg. (HLB) by appointment.

Level = 6

Purpose: To provide students with the theoretical background and practical tools background and hands-on experience utilized in molecular evolution studies. In addition, students will practice important skills such as critical thinking, manuscript and proposal writing, peer-review, and public presentation.

Course information:
Class meets:  
  - Lecture on Mon/Wed 4:10–5:00 PM at 311 Old Heep  
  - Lab on Fri 10:00AM–12:00PM at 311 Old Heep

Course Description: Examine the theory and tools used in the analysis of molecular evolutionary patterns of DNA and protein sequences. Format combines lecture presentations by instructor, discussion of relevant scientific literature, computer exercises, preparation of research proposal or independent research project, and practice in peer-review process.

Course credit:
3 semester hours, based on two one-hour lectures per week and one two-hour laboratory/discussion session per week.

Prerequisite:
Basic courses in general Genetics and in Evolution.

Textbook (Optional):

Additional Recommended Books

Course Web Site: http://wfsr.tamu.edu/mateoslab/MolecularEvolution
The content of the website is password protected for copyright reasons. Please do not make material (including password) available to people who are not registered in this course.
Login: nature\wfsrgene689  Password: G3n32008123

Grading

[91–100% = A; 81–90% = B; 71–80% = C; 61–70 = D; ≤ 60 = F]

Grades will be based on:
Final project proposal (5%)
First draft of Final paper (10%)
Written review of peers’ (10%)
Final Paper (35%)
Final Paper in-class Presentation (10%)
Homework/lab assignments (15%)
Class participation (includes leading paper discussions) (15%)

Attendance:

Attendance to lectures and labs is compulsory. Student should inform me as soon as possible if he/she plans to miss (or has missed due to unforeseen valid reasons) a lecture or lab/discussion due to a valid reason. Assignments will be given during lectures. Student is responsible for assignments even if he/she did not attend lecture during which the assignment was given, unless other arrangements have been made with the instructor. Each student will be responsible for leading the discussion of several papers throughout the semester, which will be assigned by me.

Discussion participation: you will be expected to hand in via email or hardcopy at least three discussion points/questions regarding each paper to be discussed, prior to the discussion session. Questions that just reflect ignorance of the topic will not be accepted. However, part of the discussion session can be used to clarify concepts.

Americans with Disabilities Act (ADA) Policy Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Cain Hall or call 845-1637.

Academic Integrity Statement:
"An Aggie does not lie, cheat, or steal or tolerate those who do.”
<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Date</th>
<th>Tentative Topic/Activity</th>
<th>Final project requirements</th>
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<tbody>
<tr>
<td>1</td>
<td>Mon</td>
<td>8/25</td>
<td>Introduction to course</td>
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<td></td>
<td>Wed</td>
<td>8/27</td>
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<td></td>
<td>Fri</td>
<td>8/29</td>
<td>Basic Bioinformatics exercise</td>
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<td>2</td>
<td>Mon</td>
<td>9/1</td>
<td>Dynamics of genes in populations</td>
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<td>Wed</td>
<td>9/3</td>
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<td></td>
<td>Fri</td>
<td>9/5</td>
<td>Discussion</td>
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<td>3</td>
<td>Mon</td>
<td>9/8</td>
<td>Evolutionary change in nucleotide sequences</td>
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<td></td>
<td>Wed</td>
<td>9/10</td>
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<td></td>
<td>Fri</td>
<td>9/12</td>
<td>No Class; Academic Convocation</td>
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<td>4</td>
<td>Mon</td>
<td>9/15</td>
<td>Molecular Phylogenetics</td>
<td>One-page proposal</td>
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<td></td>
<td>Wed</td>
<td>9/17</td>
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<td>due</td>
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<td></td>
<td>Fri</td>
<td>9/19</td>
<td>Discussion: Species trees from gene trees</td>
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<td>5</td>
<td>Mon</td>
<td>9/22</td>
<td>Rates and Patterns of nucleotide substitution: Molecular Clocks</td>
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<td></td>
<td>Wed</td>
<td>9/24</td>
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<td>Fri</td>
<td>9/26</td>
<td>Lab: relaxed clocks</td>
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<td>6</td>
<td>Mon</td>
<td>9/29</td>
<td>Measures of clade support</td>
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<td>Wed</td>
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<td>Fri</td>
<td>10/3</td>
<td>Discussion: Topology-Bayes vs Clade Bayes</td>
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<td>7</td>
<td>Mon</td>
<td>10/6</td>
<td>Rates and Patterns of nucleotide substitution: Detecting positive selection (Phylogenetic approach)</td>
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<td>Fri</td>
<td>10/10</td>
<td>Lab: detecting positive selection</td>
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<td>8</td>
<td>Mon</td>
<td>10/13</td>
<td>DNA Polymorphism in populations: Detecting natural selection</td>
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<td></td>
<td>Wed</td>
<td>10/15</td>
<td>Introduction to the Coalescent</td>
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<td>Fri</td>
<td>10/17</td>
<td>Discussion: Detecting natural selection</td>
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<td>9</td>
<td>Mon</td>
<td>10/20</td>
<td>DNA Polymorphism in populations: the Coalescent</td>
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<td>Wed</td>
<td>10/22</td>
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<td>10/24</td>
<td>Discussion</td>
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<tr>
<td>10</td>
<td>Mon</td>
<td>10/27</td>
<td>DNA Polymorphism in populations: Population structure and migration</td>
<td>First draft due</td>
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<td></td>
<td>Wed</td>
<td>10/29</td>
<td>Recombination</td>
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<td>Fri</td>
<td>10/31</td>
<td>Lab: LAMARC</td>
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<td>11</td>
<td>Mon</td>
<td>11/3</td>
<td>Evolution by Gene Duplication, Exon Shuffling and Concerted Evolution</td>
<td>Peer-reviews due</td>
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<td>Wed</td>
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<td>Fri</td>
<td>11/7</td>
<td>Discussion</td>
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<td>12</td>
<td>Mon</td>
<td>11/10</td>
<td>Evolution by transposition and horizontal transfer</td>
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<td>Wed</td>
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<td>Fri</td>
<td>11/14</td>
<td>Discussion</td>
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<td>13</td>
<td>Mon</td>
<td>11/17</td>
<td>Genome organization and Evolution</td>
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<td>Fri</td>
<td>11/21</td>
<td>Discussion</td>
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<tr>
<td>14</td>
<td>Mon</td>
<td>11/24</td>
<td>Roles of Mutation and Selection in Molecular Evolution</td>
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<td>Wed</td>
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<td>Fri</td>
<td>11/28</td>
<td>No Class; Thanksgiving Holiday</td>
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<tr>
<td></td>
<td>Mon</td>
<td>12/1</td>
<td>Redefined Friday. Start 9:30 AM.</td>
<td>Final presentations</td>
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<td>Wed</td>
<td>12/3</td>
<td>Tentative date for course evaluations</td>
<td>Final paper due</td>
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3
May 1, 2008

Memorandum

To: Dr. James R. Wild  
Faculty of Genetics  
MS # 2128

Through: Dr. Tom Lacher, Head  
Department of Wildlife & Fisheries Sciences

From: Dr. Mariana Mateos, Assistant Professor  
Department of Wildlife and Fisheries Sciences

Re: WFSC 648 Molecular Evolution

The Department of Wildlife and Fisheries is proposing a new course, WFSC 648 “Molecular Evolution.” The course is intended for graduate students from any department, particularly those students within the Ecology and Evolutionary Biology group. We believe this course does not overlap but is complementary to Quantitative Phylogenetics, Population Genetics, and Conservation Genetics (courses in your program; one of which I teach). I am hoping that we can cross-list this new course with your program.

Attached is the syllabus with a course description for your evaluation. Please review these materials and indicate, by your signature below, that this course does not replace curricula in your program. We would appreciate your response by Friday, April 18, 2008. If you have any questions, please feel free to contact me by email at mmateos@tamu.edu or phone number 847-9462.

_________________________  6 May 2008
James R. Wild  
Signature  
Date

2258 TAMUS  
College Station, TX 77843-2258  
Tel. 979.847.9642  
Fax. 979.845.4096  
Email: mmateos@tamu.edu  
http://wfsc.tamu.edu/mateoslab/
March 5, 2008

Memorandum

To: Dr. Vincent Cassone, Head
Department of Biology
MS # 3258

Through: Dr. Tom Lacher, Head
Department of Wildlife & Fisheries Sciences

From: Dr. Mariana Mateos, Assistant Professor
Department of Wildlife and Fisheries Sciences

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The Department of Wildlife and Fisheries is proposing a new course, WFSC 648 “Molecular Evolution.” The course is intended for graduate students from any department, particularly those students within the Ecology and Evolutionary Biology group. We believe this course does not overlap but is complementary to Evolution courses in your department.

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[Signature]

Date

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http://wfsc.tamu.edu/mateoslab/