Syllabus
CSUF Biology 402
Computer Lab in Molecular Systematics
Spring, 2006
(Sched. #: 17595, Sec. 1)
MH 319 - Lecture: TR 11:30-12:20; Lab: R 1-3:50

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Email: deernisse@fullerton.edu
Office MH217C, Enter Rm. 207
Office Hrs.: MW 2:15-3:45 T 1:00-3:00 (Subject to Change)
Main Course Website: http://biology.fullerton.edu/biol402
See this home page for links to the lecture and lab schedules for the course.

Prerequisites: Upper-division undergraduate or graduate student status with completion of Biology Core, or by permission of the instructor (note that upper-division computer science or chemistry students with an interest in bioinformatics are likely to be welcome). This is truly an upper-division course, which will be difficult for students without a strong background in at least some molecular biology. Some basic computer experience with word processors and web browsers is necessary. Familiarity with particular computers or software is not, but some experience with computers is generally helpful.

Objectives: To gain practical and theoretical experience with primary software tools employed in molecular systematics through a series of lab assignments and lectures. Subjects emphasized include navigation of Internet resources for molecular biologists, gene and protein sequence data acquisition, similarity searches, multiple sequence alignment, molecular secondary structure prediction, sequence evolution simulations, and especially phylogenetic analysis of sequence alignments.

Required Materials: Molecular Markers, Natural History, and Evolution, by John C. Avise, required. The attached lecture schedule specifies reading assignments. Selected reading and “Exercise” write-ups will be provided as handouts, as announced in class. The latter are specific to this course. You can store your files on a MH 319 hard disk in a “Student Temp” folder and also email them as attachments to yourself. Because neither of these strategies is completely safe, I recommend that you save to your own flash, floppy, zip, or cd drives copies of any file that you expect to keep or use on another computer. An additional requirement is that you purchase a folder or 3-ring binder in order to hold the reading handouts and assignments. The exercises build on each other so it is important that you have access to your notes and handouts from earlier ones.

Grades: These will be primarily based on successful completion of lab exercise reports write-ups, including an independent final written project and oral presentation. There will also be
periodic reading assignments and regular in-class quizzes each worth 5 points intended to encourage you to keep up with your assigned reading. You should expect a quiz at the beginning of each class session, although it is probable that some class sessions will have no quiz. There are also tentatively three non-cumulative midterm exams scheduled.

1) **Lab exercise reports** (15-30 points each, approx. 150 points total) – This course is organized around a series of exercises designed to give you first-hand experience with the concepts and skills required for molecular systematics. Specific objectives that you are expected to meet and report organization components that you are expected to include will be specified in the assignment hand-out or in a separate rubric. Unless announced otherwise, you will be required to turn in a hard copy of each write-up, to be turned in to me at the beginning of the lab meeting on the due date. If you are unable to attend class for reasons of illness, please turn the write-up in to my mailbox in the Biology Office (MH282). Missing lecture and especially lab because you are not ready to turn in a lab write-up is much worse than turning in your write-up a day late. You will receive additional instructions on how to turn any electronic version of your data set(s) or parts of your write-up if that is also required. The reason for the latter is if I want to be able to directly examine or test any data file that you have assembled in support of your hard-copy report. You are also expected to organize all files associated with particular exercises within an enclosing folder including your last name. Inside this folder, all files from each exercise should be in its own separate folder labeled as “Exercise_N” where “N” is the assignment number. There will also be very important conventions in naming files that will need to be closely followed. An example might be “Ex1c_nex.txt” for the third (“c”) updated version of your Exercise 1 data text (“.txt”) file in “Nexus” format. More details will follow. Please keep electronic files well organized so that if I need to consult them during lab troubleshooting or during grading, I can find them in your folder on the lab computer assigned to you. In general, the exercises will be designed so that you can complete the data analysis portion within the weekly lab period and, in many cases, depend on software that is licensed for use only on the lab computers. The lab will normally be opened for your use only during the time scheduled for lab, with very limited or no specially arrangement opportunities for you to use the lab during another time. For this reason, the opportunity for you to make up lab exercises will be severely limited.

2) **Independent final project** (70 points total; 10 points for an abstract, 30 points for an oral presentation in one of the last few class sessions, and 30 points for the written report (including the final abstract) that is due by regularly scheduled Final Exam). This final project will essentially be your last, and most important, assigned exercise. The written part will build on the report completion skills emphasized in the previous exercises, with a format similar to one you would use for the submission of an article for publication in an appropriate scientific journal. The first part of your final project will be an abstract that must be turned in by a date to be announced in advance of the presentations. This will be critiqued and you will have an opportunity to revise it for inclusion in the final meeting-style compilation of abstracts. It is critical that you meet the deadlines for submission, revision, and resubmission or no points will be given for the abstract. The oral presentation will require that you present a 12-15 minute summary of your final project, followed by a 5-minute period when you will be expected to answer questions from the audience. Your presentation should be supported by appropriate graphics, normally as a Microsoft PowerPoint or Apple Keynote slide presentation. The format will be the same as you would expect if you were to present your research at an appropriate scientific conference. You must assume that your audience is not already familiar with specific aspects of your study, but can
assume they will be reasonably familiar with the basic methods and terminology of molecular systematics.

3) **Quizzes** (5 points each, approx. 100 to 150 points total) – You should expect a brief (usually two question) quiz every lecture period, although I might elect to cancel the quiz for a particular date either with or without warning. Quizzes will normally be short-answer questions related to the assigned material and particularly related to on-line review questions linked to the on-line lecture schedule to help you guide your studying. The quizzes might bring in other aspects of the assigned material as well so you still need to read and comprehend the entire assigned pages. Because this is a new book for me to read as well, I will only guarantee that I will post the review questions by the morning the day before the scheduled course meeting and quiz, although I anticipate that I will normally post questions earlier than this. There will be no make-up for quizzes for any reason. If you have a legitimate excuse for missing a quiz, I can pro-rate the missed quiz. An example of a legitimate excuse would be an illness with an accompanying note from your physician.

4) **Other assignments** (5-10 points each, approx. 30 points total) – There could be take-home or on-line assignments for material that I feel would be best learned by giving you hands-on problem solving experience.

5) **Midterm exams** (60 points each, three exams total) will be confined to the 50 minute lecture portion of the course on the scheduled date, unless otherwise announced. For example, it is possible that I will elect to give the second or third exam as a take-home exam. Because of their short duration, do not expect that everything we have studied will be on the exam. Instead, they will be designed to assess your overall comprehension and integration of the concepts and important themes covered.

6) **The following scale:** Grades will be assigned based on the following scale (i.e., percentage of the total possible points): The following +/- grading scale will be used in this course:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>92-100</td>
</tr>
<tr>
<td>A−</td>
<td>88-91</td>
</tr>
<tr>
<td>B+</td>
<td>85-87</td>
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<tr>
<td>B</td>
<td>80-85</td>
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<tr>
<td>B−</td>
<td>77-79</td>
</tr>
<tr>
<td>C</td>
<td>69-71</td>
</tr>
<tr>
<td>C−</td>
<td>66-68</td>
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<tr>
<td>D+</td>
<td>60-65</td>
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<tr>
<td>D</td>
<td>55-59</td>
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<tr>
<td>F</td>
<td>0-54</td>
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<tr>
<td>C+</td>
<td>72-76</td>
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The cut-off levels might be lowered in your favor but will not be raised.

You can turn in one exercise write-up and one assignment late. After that, any late write-up/assignment turned in late without a valid excuse will be subject to a standard penalty of at least 10 percent reduced possible score (increasing the later it is turned in). However, it will be much better to turn in any exercise write-up or assignment late than not at all. In special cases, where I anticipate that the majority of the class will be unable to complete an assignment by the announced due date, I may elect to postpone the due date. Explanatory email messages to me at least one day before a class meeting will help me make such decisions. Because we have MH319 available for the lab component of this course for only 3 hours per week, you will be expected to use the scheduled lab time expediently and, if necessary, complete exercises at available
computers at home or in drop-in campus computer labs. The lab exercises (including the final project) are emphasized as the most important component of this course.

Some extra credit points (max. 15) will be available for attending and appropriately reporting on specific optional activities such as selected seminars related to the course, with a maximum of 5 points per activity. Further details will be announced well in advance of any activity that qualifies for extra credit.

MAKE-UP POLICY
Missed exams or assignments (but see above) that are feasible to make up can be made up or rescheduled ONLY under the following conditions:

1. Arrangements are made a week or more prior to the exam or assignment for important, unavoidable conflicting activities (e.g., surgery, out-of-town job interview, etc.). Documentation is required.
2. For illness, personal tragedy, or unavoidable emergencies, call me or leave a message with the department before the assignment or within two days thereafter.

Contact me to confirm whether you meet the requirements for make-up exams or assignments. That is your responsibility. Failure to follow the above guidelines will result in a zero grade for an exam or assignment. Failure to complete any graded assignment may result in a lowered grade or a grade of “incomplete” for the course.

ACADEMIC DISHONESTY POLICY
Academic dishonesty includes such things as cheating, inventing false information or citations, plagiarism, and helping someone else commit an act of academic dishonesty. It usually involves an attempt by a student to show possession of a level of knowledge or skill that he or she does not possess. Cheating is the act of obtaining or attempting to obtain credit for work by the use of any dishonest, fraudulent, or unauthorized means. Plagiarism is the act of taking the specific substance of another and offering it as one's own without giving credit to the source. Although you will regularly be working together with one or more of the other students in order to complete your lab exercise, it is expected that you will complete your exercise write-ups or other take-home assignments on your own. Use online forums, work together, and get information from the Web, but when you write your exercise reports or write answers to assignments, your work must reflect your independent thinking. When you use information from sources external to yourself, you need to reference the source appropriately (literature citation, URL for web-derived material). Just because you referenced a source does not give you the right to insert segments, verbatim, into papers you write. An instructor who believes that an act of academic dishonesty has occurred is obligated to discuss the matter with the student involved. The instructor should possess reasonable evidence, such as documents or personal observation. An instructor who is convinced by the evidence that a student is guilty of academic dishonesty shall (1) assign an appropriate academic penalty; and (2) report to the student involved, to the department chair, and to the vice president for student affairs the alleged incident and make recommendations for action. See the CSU Fullerton Catalog for further details.

Rules About Withdrawing from Courses: CSUF has a policy (UPS 300.016) regarding withdrawal from classes. After the first census date, students may be granted withdrawal only by presentation of documentation outlining a physical, medical or emotional condition that prevents completion of the course. Poor academic performance is not evidence of a serious reason for
withdrawal. Students unable to produce official documentation will be required to take the grade they have earned in the class.

**Major Fields Test in Biology:** IF YOU ARE A SENIOR BIOLOGICAL SCIENCE MAJOR WHO IS PLANNING TO GRADUATE IN JUNE, AUGUST, or DECEMBER 2006 (January 2007): You are required to take the Major Fields Test in Biology in order to graduate. There is no cost to you to take the exam, which is paid for by the Department of Biological Science. The 2006 exam will be offered tentatively Thursday March 16 from 4-7 pm and Friday March 17 from 1-4 pm. You will receive the details about signing up for the exam early in the semester.

**Classroom and Computer Lab Safety:**
In the event of an emergency such as earthquake or fire:
- Take all your personal belongings and leave the classroom. Use the stairways located at the east, west, or center of the building.
- Do not use the elevator. They may not be working once the alarm sounds.
- Go to the lawn area towards Nutwood Avenue. Stay with class members for further instruction.
- For additional information on exits, fire alarms and telephones, Building Evacuation Maps are located near each elevator.
- Anyone who may have difficulty evacuating the building, please see me after class.
- Dial 911 on any campus phone, pay phone, or blue emergency phones to connect directly to University Police. Dialing 911 on your cell phone will connect with the Highway Patrol. Tell CHP dispatcher that CSUF Police is the responding agency. Stay on the line until asked to hang up.

Other safety issues:
- Food or drink is not allowed in the computer lab in order to protect the computers. Exceptions must be cleared with the instructor.
- To avoid the risk of electrocution, never stick your fingers in an electrical outlet and do not touch the metal parts of plugs that are in contact with an electrical outlet.
- Do not touch internal portions of any computer that might be opened for maintenance as some parts can pose a significant threat of electrical shock.
- If you want to bring visitors to the classroom, you must obtain permission from the instructor in advance and must sign a volunteer form.
- You may work alone in the computer lab only with explicit permission of the instructor.
- There is no smoking within 20 feet of every campus building. This especially includes the MH balcony because the air intake for MH is directly above these balconies.

**Tentative Schedule:** There are provisional lecture and lab appended to this syllabus, copied from: [http://biology.fullerton.edu/biol402/lecture.html](http://biology.fullerton.edu/biol402/lecture.html) and: [http://biology.fullerton.edu/biol402/lab.html](http://biology.fullerton.edu/biol402/lab.html). Please note that the current and official schedule will be the one posted to the web by Monday at 8 a.m. of each week. If there are problems, please contact me as soon as possible. In the event that the Biology server ([http://biology.fullerton.edu](http://biology.fullerton.edu)) is down for unknown reasons, I will attempt to mirror critical course web pages at: [http://scied.fullerton.edu/biol409/biol402/index.html](http://scied.fullerton.edu/biol409/biol402/index.html) (not yet available).

**Email and Phone Logistics:** Due to the increase in SPAM email, please ALWAYS put “BIOL402” or something similar in the subject of your email. Also, if you mail from a campus or family member’s computer, so that it is not obvious who sent the email, please remember to end your email with your name and current email address. It is my policy to respond to email
questions or comments that meet these criteria within 48 hours. Under most circumstances, I will reply even sooner. Alternatively, feel free to call my office at extension 3749 [or (714) 278-3749].

**Office Hour Logistics:** Many students are confused on their first to my office. In order to get to my office (MH217C) you must first gain access to the outside door (MH207) by calling me on the campus phone (extension 3749) just outside that door.