College Document # COAS147
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CATALOG YEAR __2006-2007_____
(Please use separate form for each add/change)

COLLEGE/SCHOOL : _____College of Arts & Sciences_____

Current Catalog Page(s) Affected _____pg. 260_____

Course: Add: __X___ Delete: _____
(check all that apply) Change: Number ____ Title _____ SCH _____
Description _____ Prerequisite _____

If new, provide Course Prefix, Number, Title, SCH Value, Description, prerequisite, and lecture/lab hours if applicable. If in current catalog, copy and paste the text from the and indicate changes in red.

BIOL 5409 Molecular Systems Biology and Chemical Genetics. Four semester hours. A course dedicated to the discussion of current approaches to study "Omics" or systems biology, and the impact of chemical genetics in understanding how to activate or inactivate gene products as a way to determine the cellular function of proteins. Molecular Systems Biology and Chemical Genetics covers topics at the molecular level, including research in the evolving areas of genomics, proteomics, metabolomics, bioinformatics, microbial systems, and the integration of cell signaling and regulatory networks. Prerequisite: Graduate standing and permission of instructor. Lab fee: $30.00. (Cross-listed with BIOL 4409 and CHEM 4409)

Justification: New course to support the Master of Science in Biology. Cross listed with existing courses (BIOL4409 and CHEM4409)

Program: Add: _____ Change: _____ Attach new/changed Program of Study description and 4-year plan. If in current catalog, copy and paste the text from the and indicate changes in red.

Minor: Add: _____Delete: _____ Change: _____ Attach new/changed minor.
If in current catalog, copy and paste the text from the and indicate changes in red.

Faculty: Add: _____ Delete: _____ Change: _____ Attach new/changed faculty entry.
If in current catalog, copy and paste the text from the and indicate changes in red.

College Introductory Pages: Add information: _____ Change information: _____
Attach new/changed information. If in current catalog, copy and paste the text from the and indicate changes in red.

Approvals:	Signature	Date
Chair Department Curriculum Committee	Thomas Vaughan Digitally signed by Thomas Vaughan DN: CN = Thomas Vaughan, C = US, O = Texas A&M International University, OU = College of Arts and Sciences - Dept. of Biology and Chemistry Date: 2006.01.20 13:05:39 -06'00'	
Chair Department	D. Mott Digitally signed by D. Mott DN: CN = D. Mott, C = US, O = COAS, OU = TAMIU Date: 2006.01.20 17:28:38 -06'00'	
Chair College Curriculum Committee	Neal McReynolds Digitally signed by Neal McReynolds DN: CN = Neal McReynolds, C = US, O = TAMIU, OU = Department of Biology and Chemistry Date: 2006.01.23 16:29:05 -06'00'	
Dean	Dr. Nasser Momayezi - Dean Digitally signed by Dr. Nasser Momayezi - Dean DN: CN = Dr. Nasser Momayezi - Dean, C = US, O = Texas A&M International University, OU = C.O.A.S. - Dean's Office Reason: I have reviewed this document Date: 2006.01.23 16:45:10 -06'00'	

TEXAS A&M INTERNATIONAL UNIVERSITY
DEPARTMENT OF BIOLOGY and CHEMISTRY

BIOL5409

MOLECULAR SYSTEMS BIOLOGY &
CHEMICAL GENETICS

Semester
Class schedule
Class location
Instructor: Mario G. García-Ríos
Office: LBVC-379C
E-mail: mgarcia@tamiu.edu
Office Hours:

Course Web Pages

1. NCBI site. http://www.ncbi.nlm.nih.gov This is the main site for course algorithms.
2. GENETICS PLACE. http://www.geneticsplace.com. Navigation starting point for book activities.

I. COURSE DESCRIPTION

A discussion of current approaches to study "Omics" or Systems Biology, and the impact of chemical genetics in understanding how to activate or inactivate gene products as a way to determine the cellular function of proteins. Molecular Systems Biology and Chemical Genetics covers topics at the molecular level, including research in the evolving areas of genomics, proteomics, metabolomics, bioinformatics, microbial systems, and the integration of cell signaling and regulatory networks.

II. LEARNING OUTCOMES

By the end of the semester you should achieve the following:

1. Be capable of explaining the properties and behavior of complex biological systems in terms of their molecular components and their interactions.
2. Using the tools of genomics, identify regions of functional importance in cistronic units.
3. Identify small molecules with potential activity in signal transducing pathways.
4. Evaluate different algorithms used in systems biology and combinatorial chemistry to determine biochemical activity.

III. COURSE GRADING POLICY

We will discuss several papers from the primary literature that are fundamental in understanding systems biology. As a graduate student, you are expected to work on 120 discovery inquiries to learn the fundamentals of bioinformatics and "omics" techniques and tools. Each discovery question must be successfully answered in order to proceed to the next question. Therefore, it is of utmost importance that you make every effort to clarify any concerns in a timely manner. You are expected to write a critical summary for each of the papers assigned in the course. Each summary must include the following: 1) Statement indicating a major goal of the topic, 2) Alternate techniques available, with advantages and shortcomings, and 3) Potential improvements.

Your grade will be computed as follows:

1. Chapter Discovery Questions	30%
2. Exam I	20%
3. Exam II	20%

4. Final Exam	20%
5. Critical summaries	10%

E-mail communication will be important. Please make sure that I have your working TAMIU e-mail address. No exceptions. Announcements, lecture notes, and other course materials will often be distributed electronically. Also, you should bring a laptop computer to class every day after the first week. I have five laptops available for those of you who do not own one. Please let me know before the end of the first week of classes if you will be borrowing a laptop from me.

IV. TEXT

Discovering Genomics, Proteomics and Bioinformatics. A. Malcolm Campbell and Laurie J. Heyer (2003) CSHL Press/Benjamin Cummings; ISBN 0-8053-4722-4

Microarray Gene Expression Data Analysis: A Beginner's Guide. H. C. Causton, J. Quackenbush and A. Brazma (2003) Blackwell Publishing; ISBN 1-40510-682-4

Genomic Medicine Readings (GM readings). http://content.nejm.org/misc/genmed.shtml

Additional Readings will be assigned in class.

V. ATTENDANCE and PARTICIPATION

Regular attendance and thoughtful, informed participation in class discussions is expected. You should read the appropriate material prior to attending lecture. This will ensure a better understanding of the ideas presented in the classroom. Special reading assignments will be announced in class, and may include material not present in your text. You are expected to be present for every class meeting. **No** make-ups of exams will be allowed except in the case of verifiable serious illness or other similar situation.

VI. UNITS OF INSTRUCTION

1. Course schedule (subject to adjustments):

Topic	Date	Readings
Introduction		
Genomic Medicine I		GM reading 1
Genome Sequence Acquisition and Analysis		Chapters 1-3
Genomic Medicine II		GM reading 2
GATTACA analysis		
Exam I		
Genome Sequences Answer Crucial Questions		Chapters 4-6
Genomic Medicine III		GM Reading 3
NCHPEG case studies		CD/NHPEG
Exam II		
Genomic Variations		Chapter 7-9
Genomic Medicine IV		GM Reading 4
Basic Research with DNA Microarrays		Chapter 10 &11
Final Exam		

VII. READINGS LIST

The following readings are available at:

http://content.nejm.org/misc/genmed.shtml

GM reading 1: http://content.nejm.org/cgi/content/full/347/19/1512

GM reading 2: http://content.nejm.org/cgi/content/full/347/23/1867

GM reading 3: http://content.nejm.org/cgi/content/full/348/1/50

GM reading 4: http://content.nejm.org/cgi/content/full/348/6/529

VIII. UNIVERSITY REGULATIONS

Classroom Behavior

The College of Arts and Sciences encourages classroom discussion and academic debate as an essential intellectual activity. It is essential that students learn to express and defend their beliefs, but it is also essential that they learn to listen and respond respectfully to others whose beliefs they may not share. The College will always tolerate diverse, unorthodox, and unpopular points of view, but it will not tolerate condescending or insulting remarks. When students verbally abuse or ridicule and intimidate others whose views they do not agree with, they subvert the free exchange of ideas that should characterize a university classroom. If their actions are deemed by the professor to be disruptive, they will be subject to appropriate disciplinary action, which may include being involuntarily withdrawn from the class.

Copyright Restrictions

The Copyright Act of 1976 grants to copyright owners the exclusive right to reproduce their works and distribute copies of their work. Works that receive copyright protection include published works such as a textbook. Copying a textbook without permission from the owner of the copyright may constitute copyright infringement. Civil and criminal penalties may be assessed for copyright infringement. Civil penalties include damages up to $100,000; criminal penalties include a fine up to $250,000 and imprisonment.

Copyright laws do allow students and professors to make photocopies of copyrighted materials under strict conditions. You may not copy most, much less all, of a work, but you may copy a limited portion of a work, such an article from a journal or a chapter from a book. These copies must be for your own personal academic use or, in the case of a professor, for personal, limited classroom use. In general, the extent of your copying should not suggest that the purpose or the effect of your copying is to avoid paying for the materials. And, of course, you may not sell these copies for a profit. Thus, students who copy textbooks to avoid buying them or professors who provide photocopies of textbooks to enable students to save money are both violating the law.

Plagiarism and Cheating

Plagiarism is the presentation of someone else's work as one's own. Recently, the Internet has complicated the picture. Getting something from the Internet and presenting it as one's own is still plagiarism. Copying another student's paper or a portion of the paper - is usually called "copying". Neither plagiarism nor copying will be tolerated. Should a faculty member discover that a student has

committed plagiarism, the students will receive a grade of 'F' in that course and the matter will be referred to the Executive Director of Student Life for possible disciplinary action.

Students with Disabilities

Texas A&M International University seeks to provide reasonable accommodations for all qualified persons with disabilities. This University will adhere to all applicable federal, state, and local laws, regulations and guidelines with respect to providing reasonable accommodations as required to afford equal education opportunity. It is the student's responsibility to register with the Director of Student Counseling and to contact the faculty member in a timely fashion to arrange for suitable accommodations.

Incompletes

Incompletes are discouraged and are assigned only under extenuating circumstances. In fairness to those students who complete the course as scheduled, under no circumstances will an Incomplete ("I") be changed to an "A" unless the student has experienced a death in the immediate family or has a written medical excuse from a physician.

Independent Study Courses

Independent Study (IS) courses are offered only under exceptional circumstances. Required courses intended to build academic skills may not be taken as IS (e.g., clinical supervision and internships). No student will take more than one IS course per semester. Moreover, IS courses are limited to seniors and graduate students. Summer IS course must continue through both summer sessions.

Student Responsibility For Dropping a Course

"It is the responsibility of the STUDENT to drop the course before the drop date. Faculty are not responsible for dropping students who suspend class attendance".

Final Examination

Final Examinations must be comprehensive and must be given on the day specified.

Student E-mail Address

All students must obtain a TAMIU e-mail address