UTRGV Department of Health and Biomedical Sciences Fall 2015

BMED4220_01 Medical Bioinformatics, Genomics and Systems Biology

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Thursdays 7:10am - 9:40am, LHSB 1.410
see detailed schedule below Office location: BRHP 1.121
Office hours: Thursdays 10am-1pm and by appointment

Textbook and/or Resource Material
Lesk, A. 2014: Introduction to bioinformatics, 4th edition. Oxford University Press.
ISBN: 978-0-19-965156-6
You will need a laptop with internet access. Computers are available in the classroom, but you can use your own laptop for class exercises. Tablets such as ipad are not going to work for some assignments.

Course Description and Prerequisites
This course presents a problem solving approach to understanding genomics using bioinformatics applications. Covering the latest techniques that enable the study of the genome in ever-increasing detail, this course explores what the genome reveals in health and disease. This is a course where students will learn how to work with genomic data. The course will cover the theory and latest techniques used to sequence, functionally analyze and study genes and genomes using available databases.

Learning Objectives/Outcomes for the Course

First, students should understand genomics principles and be able to apply them to medical situations. Secondly, students should be able to evaluate scientific observations and apply several biological principles to explain observations that may be encountered in medical practice relating to genomics principles. Thirdly, students should gain some insight into the methods used by genomics biologists and bioinformaticists in their research especially as it relates to large-scale high-throughput biology. Fourth, students should be able to interpret figures, tables and charts and use common genomics databases. Fifth, the student should develop an appropriate genomics and bioinformatics vocabulary to express in verbal and written form observations, principles and theories as they relate to genomics, bioinformatics and systems biology.

Course pre- or co-requisites:
BMED 4230 Medical Genetics, BMED1104 Molecular Biology, BMED1105 Introductory Medical Genetics

Grading Policies
Two practical/theory exams covering methods learned in class, each worth 20% will be given. All students are required to give a powerpoint presentation on a genomic case study, also worth 20%. Three short writing assignments are each worth 5% of the grade. Class attendance and participation counts for another 25%. UTRGV's grading policy is to use straight letter grades (A, B, C, D, or F). Details about assignments are listed below.

Calendar of Activities
Include in this section a table or list that provides information for students regarding important dates, assignments or activities. The UTRGV academic calendar can be found at http://my.utrgv.edu at the bottom of the screen, prior to login. Important dates for Fall 2015 include:

August 31	Classes Begin
September 7	Labor Day Holiday; university closed
September 16	Last day to drop a class before it appears on the transcript and counts toward the "6-drop" limit. Last day to receive a 100% refund for dropped classes (other policies apply when a student is withdrawing from all classes).
November 18	Drop/Withdrawal Deadline; last day for students to drop the course and receive a DR grade. After this date, students will be assigned a letter grade for the course that will count on the GPA.
November 26-27	Thanksgiving Holiday; university closed
December 10	Study Day; no classes
December 11-17	Final Exams

Other Course Information
Assignment Details:

Three writing assignments, each 50 points:
Watch the three episodes of the documentary "The emperor of all maldies".
Write a short essay about your thoughts on a topic of your choice of the videos, either a historical issue, or a patient case and the treatment for example.

Use 10 point font Arial, one inch margin, single spaced lines. Write 30-40 lines of text per episode.

Due dates: Episode 1: Sept. 10; Episode 2: Sept. 17; Episode 3: Sept. 24
Link: http://video.pbs.org/program/story-cancer-emperor-all-maladies/

Exam 1: 200 points: October 1 in class.
Exam 2: 200 points: take home at Oct 23, due November 19, submitted through blackboard, late submissions with 10% penalty per hour late.
Presentations of a paper using bioinformatics methods in medicine. Dec 3 and Finals week. Each student will have an assigned day (200 points).

Other class days: Sept 10, 17, 24; Oct 8,15, 22 activities and attendance, 50 points each. You can miss one of those without penalty.

Schedule, please note that we will not meet in class during some weeks. To make up for missed time we will meet at an extended time during other days. Those days, marked with an * we will meet 7:10-9:40am.

date	**Activity**	**reading assignments (before class), for additional readings check blackboard**	**assignment due**
Thursday, Sept 3	Course overview		
Thursday, Sept 10*	Topic intro and genome organization and evolution	Lesk, Ch1 and 2	first writing assignment due
Thursday, Sept 17*	databases, archives and information retrieval	Lesk, Ch 3 and 4	second writing assignment due
Thursday, Sept 24*	Alignments and phylogenetic trees	Lesk, Ch 5	third writing assignment due
Thursday, Oct 1*	First exam in class		
Thursday, Oct 8*	Structural bioinformatics and drug discovery	Lesk, Ch 6	
Thursday, Oct 15*	Systems biology and metabolic pathways	Lesk, Ch 7 and 8	final paper choice for presentation submitted in pdf format to blackboard
Thursday, Oct 22*	Gene expression and regulation	Lesk, Ch 9	take home exam 2 will be released Oct 23 on blackboard, download
Thursday, Oct 29	no class		
Thursday, Nov 5	no class		
Thursday, Nov 12	no class		
Thursday, Nov 19	no class		
Thursday, Nov 26	Thanksgiving holiday, no class		take home exam 2 is due, submission site will be set up on blackboard
Thursday, Dec 3*	paper presentations and discussions part 1		presentations according to schedule posted on blackboard
Thursday, Dec 10	university study day, no class		
Dec 11-17 finals week, day and time TBA	paper presentations and discussions part 2		presentations according to schedule posted on blackboard

UTRGV Policy Statements
The UTRGV disability accommodation, mandatory course evaluation statement and sexual harassment statement are required on all syllabi. Additional policy statements are optional, such as those covering attendance, academic integrity, and course drop policies.

STUDENTS WITH DISABILITIES:
If you have a documented disability (physical, psychological, learning, or other disability which affects your academic performance) and would like to receive academic accommodations, please inform your instructor and contact Student Accessibility Services to schedule an appointment to initiate services. It is recommended that you schedule an appointment with Student Accessibility Services before classes start. However, accommodations can be provided at any time. **Brownsville Campus**: Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at accessibility@utrgv.edu. **Edinburg Campus:** Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at accessibility@utrgv.edu.

MANDATORY COURSE EVALUATION PERIOD:
Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (http://my.utrgv.edu); you will be contacted through email with further instructions. Online evaluations will be available Nov. 18 – Dec. 9, 2015. Students who complete their evaluations will have priority access to their grades.

ATTENDANCE:
Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences. UTRGV's attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; for observance of religious holy days; or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

SCHOLASTIC INTEGRITY:
As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism, and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

SEXUAL HARASSMENT, DISCRIMINATION, and VIOLENCE:
In accordance with UT System regulations, your instructor is a "responsible employee" for reporting purposes under Title IX regulations and so must report any instance, occurring during a student's time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect in an environment free from sexual misconduct and discrimination.

COURSE DROPS:
According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the "3-peat rule" and the "6-drop" rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.