

TSCI 6067
Genomic Healthcare
Spring 2018

CLASS DAYS and TIME: Alternate Wednesdays (January 17 – May 9, 2018), 3:00 – 5:00 pm

CLASSROOM: LIB 2.088

COURSE DIRECTOR: Donna Lehman, PhD

OFFICE LOCATION and HOURS: Medical Bldg 238D.1 Monday – Friday (8:00 am – 5:00 pm by appointment)

EMAIL: lehman@uthscsa.edu

TELEPHONE: 210-567-6714

READ THIS DOCUMENT CAREFULLY – YOU ARE RESPONSIBLE FOR ITS CONTENTS

COURSE DESCRIPTION AND OBJECTIVES

This course prepares students to integrate genomic and other omics technology into patient care and clinical research. It begins with an introduction to genomics and concise overview of omics technologies. Students will explore the different resources of genomic information and have opportunities to apply these resources to keep abreast of current knowledge in their health topic of interest including the ethical individual and societal challenges ahead. Genomics in cancers is an active area in personalized medicine, and this topic will be discussed by a local cancer genomics expert. The course will also provide an introduction and overview of current applications of gene therapeutics to a variety of disorders. By the end of the course, students will have a working knowledge of the human genome and the tools for integrating this information into clinical research as well as conveying it to patients.

Pre-requisites – There are no pre-requisites for this course.

Semester credit hours – 1.0 SCH

By the end of this course, each student should be able to:

- Articulate basic concepts and current analytical methods used for human genomics and other omics research and personalized medicine.
- Identify and use relevant databases and data sources for genomics research and application in medicine.
- Outline key concepts of study design.
- Discuss current issues of genomics in healthcare including ethical and societal challenges.
- Interpret published reports
- Discuss the potential and current limits of personalized medicine.

COURSE ORGANIZATION

The main teaching modalities used in this course include:

1. Lectures including online components
2. Class discussions requiring active student participation.
3. Assignments and in-class workshop
4. Capstone project or presentation

Materials:

No special materials are required for this course.

Computer Requirements:

Students are required to have a laptop computer that can connect to and operate over a wireless network.

Software required:

- Microsoft Office Suite (A personal copy of the latest version can be purchased at The UTHSCSA bookstore at student pricing with a student ID)

Laptops with an Apple based Operating System must be able to also operate using a Windows based Operating System. It may be necessary to purchase Windows (student pricing available at The UTHSCSA bookstore with a student ID) and virtualization software.

All laptops will connect to The UTHSCSA network via the HSCwave broadcast wireless connection. Authentication for wireless use is based on The UTHSCSA domain username and password.

Verification of proper operation **prior** to the start of class is highly recommended.

Assistance is available thru the IMS Service Desk

- Telephone:(567-7777
- E-mail (ims-servicedesk@uthscsa.edu)

Assistance is also available at the IMS Student Support Center (4.421T, DTL).

Reading Assignments – Reading assignments will be listed in the individual class sections of this syllabus.

ATTENDANCE

Attendance at scheduled classes and examinations is crucial to meeting course objectives. Therefore, regular attendance in class is expected of each student.

- Attendance is defined as being present within 15 minutes after the scheduled beginning of the class and until 15 minutes before the scheduled ending of the class.
- Excused absences may be granted by the Course Director in cases such as formal presentations at scientific meetings, illness, or personal emergency.
- Excused absences are considered on an individual basis and require electronic communication with the Course Director to request an excused absence. The e-mail request to the Course Director for consideration of an excused absence must provide details regarding the circumstances and specific dates.

- It is expected that students will provide *advanced notice* of absence for scheduled events.
- If a student has excessive unexcused absences in a given course, they will automatically receive a grade of *unsatisfactory* unless *makeup* has been approved by the Course Director.
- Makeup of absences (both excused and unexcused) is allowed at the discretion of the Course Director.
- Allowable unexcused absences will be determined by the credit hours of the course as follows:
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Course Semester Credit Hours	Allowable Unexcused Absences
3.0	3
2.0	2
1.0	1

TEXTBOOKS

None Required

GRADING POLICIES AND EXAMINATION PROCEDURES

1. Class attendance is essential for anyone who wishes to obtain credit for the course. You must attend 7 of the 8 class sessions in order to obtain credit for the course. You can make up any sessions missed due to unexpected schedule conflicts, professional travel, or other extenuating circumstances, provided you contact your course director as soon as you know you will need to miss a class. Any student who fails to meet this requirement will receive an UNSATISFACTORY grade for the course.
2. Two graded assignments are to be completed during the semester. These assignments are posted on Blackboard. Each assignment will be scored on a 100-point scale. ***You must complete and turn-in both assignments on time and receive a minimum score of 70/100 points on each assignment in order to receive credit for the course.***
 - A student who completes assignments one with 70/100 points, but fails to complete the capstone assignment with a score of 70/100 points, will receive an incomplete.
3. A student who receives an INCOMPLETE must meet with the Course Director and develop a plan of action to complete the outstanding work. All outstanding work must be completed within 1 year after the end of the course; otherwise the grade will be changed to UNSATISFACTORY.
4. A student who receives an UNSATISFACTORY grade must retake the course in order obtain a change of grade.

Grading System

The grading will be conducted on a pass fail basis and both assignments need a Satisfactory in order to pass the course.

S = Satisfactory U = Unsatisfactory
A – 90-100% B = 80-89% C = 70-79% F = 69% and below

REQUESTS FOR ACCOMODATIONS FOR DISABILITIES

In accordance with policy 4.2.3, **Request for Accommodation Under the ADA and the ADA Amendments Act of 2008 (ADAAA)**, any student requesting accommodation must submit the appropriate request for accommodation under the American with Disabilities Act (ADA, form 100). To his/her appropriate Associate Dean of their School and a copy to the ADA Coordinator. Additional information may be obtained at <http://uthscsa.edu/eo/request.asp>.

ACADEMIC INTEGRITY AND PROFESSIONALISM

Any student who commits an act of academic dishonesty is subject to discipline as prescribed by the UT System Rules and Regulations of the Board of Regents. Academic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an exam for another person, signing attendance sheets for another student, and any act designed to give unfair advantage to a student or the attempt to commit such an act. Additional information may be obtained at <http://catalog.uthscsa.edu/generalinformation/generalacademicpolicies/academicdishonestypolicy/>

TITLE IX AT UTHSCSA

Title IX Defined:

Title of the Education Amendments of 1972 is a federal law that prohibits sex discrimination in education. It reads “no person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance.”

University of Texas Health Science Center San Antonio’s Commitment:

University of Texas Health Science Center San Antonio (UTHSCSA) is committed to maintaining a learning environment that is free from discriminatory conduct based on gender. As required by Title IX, UTHSCSA does not discriminate on the basis of sex in its education programs and activities, and it encourages any student, faculty, or staff member who thinks that he or she has been subjected to sex discrimination, sexual harassment (including sexual violence) or sexual misconduct to immediately report the incident to the Title IX Director.

In an emergency, victims of sexual abuse should call 911. For non-emergencies, they may contact UPD at 210-567-2800. Additional information may be obtained at <http://students.uthscsa.edu/titleix/>

EMAIL POLICY

All correspondence will be sent to the student using the student’s LiveMail address and CANVAS. All correspondence from the student to the course director should be sent to the course director’s e-mail as listed on the first page of this syllabus.

USE OF RECORDING DEVICES

Only with course director’s or instructor’s permission.

ELECTRONIC DEVICES

Cell phones must be turned off during all class meetings and exams. Computers and electronic tablets are allowed only for participating in classroom activities (*e.g.*, viewing slides presented in lecture or conference materials). No texting, tweeting, e-mailing, web-surfing, gaming, or any use of electronic devices that is not directly connected with classroom activities is permitted.

TENTATIVE CLASS SCHEDULE

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Week	Date	Title	Instructor(s)
1	01/17/2018	Review of genome structure and Omics	Dr. Donna Lehman
2	01/31/2018	The Epigenome – Health impact and methods for study	Dr. Melanie Carless
3	02/14/2018	Stem Cells for Therapies and Disease Modeling	Dr. Donna Lehman
4	02/28/2018	Bioinformatics Resources for Human Genomics In-class hands-on workshop Assignment 1 given – due 03/28/2018	Dr. Donna Lehman
5	03/14/2018	Spring Break NO CLASS: Select papers for presentation Due for approval 03/28/2018	
6	03/28/2018	Cancer Genetics and Precision Medicine	Dr. Gail Tomlinson and START Center guest
7	04/11/2018	Gene Therapies: Methods and Applications	Dr. Donna Lehman and guest TBN
8	04/25/2018	Genetic Ethical Issues and Study Design	Dr. Donna Lehman
9	05/9/2018	Capstone Project Presentations by students	

Week: 1
Date: January 17, 2018 (3:00 - 5:00 pm)
Room: LIB 2.028
Instructor(s): Donna Lehman
Topic: Introduction and Review of Genome Structure and Omics Technologies
Learning Objectives and Competencies– Participants will be able to:
<ol style="list-style-type: none"> 1. Describe the major components of chromosome and genome structure and functional elements. 2. Understand genetic ancestry, methods to determine it, and its relevance to counseling or study of patient populations. 3. Be familiar with clinical validity and utility in genetic testing
Class Assignment:
Readings: Handouts at time of class

Week: 2
Date: January 31, 2018 (3:00 - 5:00 pm)
Room: LIB 2.028
Topic: The Epigenome – Health Impact and Methods for Study
Instructor(s): Melanie Carless, PhD
Learning Objectives – Participants will be able to:
<ol style="list-style-type: none"> 1. Articulate the major components of the epigenome 2. Understand the impact of epigenomic changes to clinical characteristics 3. Be knowledgeable of current methodologies for study of the epigenome in human context.
Class Assignment: Read assigned material and be prepared to discuss
Readings: Handouts to be distributed prior to class.

Week: 3
Date: February 14, 2018 (3:00 - 5:00 pm)
Room: LIB 2.028
Topic: Stem Cells in Therapies and Disease Modeling
Instructor(s): Donna Lehman, PhD
Learning Objectives – Participants will be able to:
<ol style="list-style-type: none"> 1. Articulate pros and cons of animal vs. human models of genetic disease 2. Understand sources of stem cells for research vs therapies and their limitations 3. Understand basic induced pluripotent stem cell reprogramming concepts 4. Be able to describe uses and advantages of human derived cells in discovery and/or preclinical research including the current limitations of this technology 5. Be familiar with contemporary applications of stem cell based therapies
Class Assignment: none
Readings: Hand out available on CANVAS

Week: 4
Date: February 28, 2018 (3:00 - 5:00 pm)
Room: LIB 2.028
Topic: Bioinformatics Resources for Genetic Analysis
Instructor(s): Donna Lehman, PhD
Learning Objectives – participants will be able to: <ol style="list-style-type: none">1. Effectively search at least 3 genomics information databases – e.g. Genetics Home Reference, UCSD Genome Browser, OMIM, ENCODE, NIH Roadmap/GTEX2. Develop a focused database search specific to their research project or health topic of interest
Class Assignment: Complete assignment out of class and submit by due date.
Readings: Posted on Canvas - optional

Week: 5
Date: March 14, 2018
SPRING BREAK – NO CLASS - Students are to select papers or specific educational topic for Capstone project/presentation and email course director with topic and/or choice of papers: Due for approval 03/28/2018

Week: 6
Date: March 28, 2018 (3:00 - 5:00 pm)
Room: LIB 2.028
Topic: Cancer Genetics
Instructor(s): Gail Tomlinson, MD and START Center clinician (TBN)
Learning Objectives – Participants will be able to: <ol style="list-style-type: none">1. Identify the hallmarks of inherited cancer susceptibility2. Describe the spectrum of genetic syndromes and risk associated with inherited breast cancer susceptibility3. Describe the genetic basis of Lynch Syndrome4. Discuss sensitive issues in communication of cancer risk.5. Understand the role of translational research in cancer care and articulate specific examples of genomics informed treatments.
Class Assignment: Read assigned material and come to class prepared to discuss.
Readings: Posted on Canvas

Week: 7
Date: April 11, 2018 (3:00 - 5:00 pm)
Room: LIB 2.028
Topic: Gene Therapies: Methods and Applications
Instructor(s): Donna Lehman, PhD and special guest TBN
Learning Objectives – Participants will be able to: <ol style="list-style-type: none">1. Understand molecular methods for gene editing and delivery of gene therapies in clinical applications2. Understand the different requirements of therapy by disease class.3. Be knowledgeable of current clinical trials and future applications.
Class Assignment: Read assigned material and be prepared to discuss
Readings: Handouts to be distributed prior to class.

Week: 8
Date: April 25, 2018 (3:00 - 5:00 pm)
Room: LIB 2.028
Topic: Genetic Study Design and Ethical Issues
Instructor(s): Donna Lehman, PhD and guest
Learning Objectives – Through class room activities, participants will be able to: <ol style="list-style-type: none">1. Articulate the means of assessing statistical and clinical significance of genetics findings in research.2. Define sources of potential confounding in genetic studies and delineate strategies to reduce it.3. Articulate the many elements of risk involved with genetic testing to patients or to participants in genetics research.4. Have a working knowledge of required IRB protocol components for genetic studies (minor aspect)
Class Assignment: Read assigned material and come to class prepared to discuss. We will work through cases in class.
Readings: To be determined.

Week: 9
Date: May 9, 2018
Room: LIB 2.028
Instructor(s): Donna Lehman, PhD
Topic: Capstone Project Presentations by students
Learning Objectives and Competencies– Participants will be able to: <ol style="list-style-type: none">1. Effectively evaluate published genetic studies OR develop a learning tool for patients or clinicians2. Define the gaps in knowledge in current studies and design study plans to fill them, OR define gaps in genetics education for clinicians and/or their patients and design educational tool to fill gap
Class Assignment: Students will present and participate in presentations of capstone projects. Students can choose from the following: in person presentation, educational tool or video
Readings: All student papers posted to Canvas – prior to class