

**CSBL 5025**  
**Genetics**  
**Spring 2017**

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**CLASS DAYS and TIME:** Genetics is scheduled to meet on Monday, Wednesday, and Friday, 8:30 - 10:00.

**CLASSROOM:** ALTC 2.215

**COURSE FACULTY:** Ellen Kraig, Ph.D.  
Christi Walter, Ph.D.  
Robin Leach, Ph.D.

**OFFICE LOCATION and HOURS:** For general aspects of the course, please contact Dr. Kraig. For more specific questions, you may contact any of the faculty instructors directly. We are available for meetings by scheduled appointment; please phone or email to identify a mutually convenient time. Our offices are located on the Long Campus: 4.013V-1 (Kraig), 225D (Walter), and 552C-3 (Leach).

**EMAIL:** kraig@uthscsa.edu, walter@uthscsa.edu, leach@uthscsa.edu,

**TELEPHONE:** Kraig: 567-3818, Walter: 567-3800, Leach: 567-6947

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**READ THIS DOCUMENT CAREFULLY - YOU ARE RESPONSIBLE FOR ITS CONTENTS**

## **COURSE DESCRIPTION AND OBJECTIVES**

This course is designed to provide an overview of current topics in genetics with a focus on mammalian systems. Topics to be discussed include: cytogenetics and chromosome dynamics, mitochondrial genetics, mutagenesis and genomic instability, programmed gene rearrangements and transposable elements, imprinting, genetic variation, linkage and methods for analyzing, population genetics, gene and cell-based therapies, and principles of rodent genetics.

**Pre-requisites** – this course is designed for students who have already taken Fundamentals of Biomedical Sciences IBMS 5000. In certain situations, the prerequisite may be waived; please consult Dr. Kraig if you wish to petition for enrollment without having taken IBMS 5000.

**Semester credit hours** – 1 credit hour

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

- Read, interpret, critically evaluate, and discuss peer reviewed primary scientific papers relevant to genetics, including publications that employ genetic techniques and others studying genetic disorders.
- Demonstrate foundational knowledge of genetics through written examinations and oral presentations.

## **COURSE ORGANIZATION**

**The main teaching modalities used in this course include:**

- 1) didactic lectures to deliver foundational and factual information about genetics
- 2) student discussions of peer reviewed papers to develop competency in applying foundational knowledge to current research
- 3) self study activities and online review to prepare for upcoming lectures and activities
- 4) student presentations on genetic topics of interest
- 5) problem sets and paper reviews

**Materials** – The required textbook, *Thompson & Thompson Genetics in Medicine*, 8th edition, by Nussbaum, McInnes, and Willard, is available at the reserve desk (front entrance) of the UTHSCSA library. Additional reading may be posted to CANVAS prior to individual lectures.

**Computer Access** – Various materials will be posted to CANVAS so students will require access to a computer with internet capabilities.

**Reading Assignments** – It is expected that students will already have a working knowledge of basic genetic principles (including concepts like “recessive/dominant”, “P1, F1, F2”, “meiosis, mitosis”, “linkage”, “pedigree”, “penetrance/expressivity”, etc.). An exercise/pre-test will be circulated to enrolled students the first week of January such that they can review the relevant concepts and ensure for themselves that they are adequately prepared. Any basic genetics text should suffice for reviewing these fundamental concepts. In addition, links to on-line resources will be provided.

In addition, as noted below, *Thompson & Thompson Genetics in Medicine*, 8th edition, is the required textbook for this course. Relevant sections that would prepare students for the individual lectures are noted on the attached class schedule. Additional reading assignments, such as primary scientific papers, may also be posted on CANVAS by the instructors and/or students.

## ATTENDANCE

Attendance at every session is expected to achieve the expected level of competency. If a student has an allowable absence (i.e., an out-of-town scientific conference), he/she should contact Dr. Kraig as soon as he/she becomes aware of the conflict so that accommodations can be made. Attendance and participation at the student presentations are mandatory. If a student becomes ill or misses a class for any other reason, he/she must contact Dr. Kraig and apprise her of the situation. If there are chronic or unexplained absences, the student’s grade will be lowered.

## TEXTBOOKS

**Required:** *Thompson & Thompson Genetics in Medicine*, 8th edition, by Nussbaum, McInnes, and Willard, is available at the reserve desk (front entrance) of the UTHSCSA library.

**Recommended:** none

## GRADING POLICIES AND EXAMINATION PROCEDURES

The student’s grade will be based on a composite score comprised of his/her performance on a written comprehensive exam covering all material presented in the course by either faculty or students (50%) and a combined score for class participation and the performance of the individual student on his/her presentation (50%). Grading is on a letter scale with the following minimal requirements: A ≥ 90%, B ≥ 80%, C ≥ 70%, D ≥ 60%, F < 60%. Fractions are rounded to the nearest whole number for the final grade. Passing requires a grade of A or B.

**Exam:** The exam will cover all material presented in the lectures, the student presentations, and any required class exercises. It may also test the ability of students to apply fundamental knowledge to discussion of primary scientific literature. Examinations can be composed of multiple choice, short answers and essay questions. NO electronic devices, extra paper, books, backpacks, etc are permitted in the testing area. Hats must be removed prior to starting the test. If you arrive late to the exam and are given permission to take the exam, you will not be given additional time to complete your test. If another student has departed the room before you arrive, you will not be able to take the exam. If a student misses the scheduled examination, he/she should contact Dr. Kraig as soon as possible to make arrangements; acceptable absences are limited to serious injury or illness to the student or a member of the student’s immediate family. If it is determined that there was an excused absence, a make-up examination will be scheduled as soon as possible at a time determined by a course director. A student who misses an exam and does not receive an excused absence from a course director, will receive a zero for the grade.

**Student presentations:** Each student will prepare a 15 minute presentation on a topic chosen by the student in consultation with the faculty instructors. The grade determined by the instructors present will be based on the student’s performance, including the scholarliness of the material selected, the care in preparation of the slides, and the clarity of the oral presentation.

## 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/eeo/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

As a matter of University Policy, official communications between students and faculty occur using the student’s university assigned “livemail” email address. Students are expected to check their university email on a daily basis. Missed communication due to inadequate monitoring of university email is not a valid excuse for failing to perform expected activities. Students are welcome to email the instructors at any time.

## USE OF RECORDING DEVICES

Course policy allows the use of recording devices, if given permission by the presenter.

## ELECTRONIC DEVICES

Cell phones shall not be used during class (unless requested to do so by the instructors). Use of social media or email via any devices is not allowed during class.

## TENTATIVE CLASS SCHEDULE

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WEEK	DATE	TOPIC	ASSIGNMENT Required readings from Thompson & Thompson; additional papers may be posted on CANVAS prior to class time	INSTRUCTOR/ MODALITY
<b>Week 1</b>	Jan 9	Chromosomes, Cytogenetics, Chromosome breakage, Aneuploidy, Syndromes	pages 57-105 <a href="http://www.slh.wisc.edu/wp-content/uploads/articulate_uploads/KARYOTYPER-Chromosome-Identification/story.html">http://www.slh.wisc.edu/wp-content/uploads/articulate_uploads/KARYOTYPER-Chromosome-Identification/story.html</a>	Chris Walter
	Jan 11	Mitochondrial genetics & diseases	pages 128-131 (required) 246-251 (recommended)	Chris Walter
	Jan 13	Genome instability: Mutagenesis, triple repeats, etc	pages 124-126, 251-255	Chris Walter
<b>Week 2</b>	Jan 16	HOLIDAY		
	Jan 18	Programmed gene rearrangements and transposable elements	37-38, 53-54	Ellen Kraig
	Jan 20	Population genetics and risk assessment	pages 155-170, 336-344	Robin Leach
<b>Week 3</b>	Jan 23	Genetic variation (including CNVs), linkage, QTLs	pages 43-48, 171-191	Robin Leach
	Jan 25	Imprinting and X chromosome inactivation	pages 39-41, 85-87, 91-94	Robin Leach
	Jan 27	Gene therapy and Cell based therapies	pages 257-281	Ellen Kraig
<b>Week 4</b>	Jan 30	Mouse genetics: practical applications (tg and ko), founder effects, backcross, speed genotyping)		Chris Walter
	Feb 1	{No class - student preparation time}		
	Feb 3	Student presentations		Walter / Kraig
<b>Week 5</b>	Feb 6	Exam		