

DNA the Code of Life - BIOL 4350
Fall 2017

Instructor: Dr. Janey Youngblom
Office Hours: Tues. & Thurs. 2:15-3:45
Email address: jyoungblom1@csustan.edu

Office Phone: 667-3487
Rm: N-265

Purpose: This course is designed to introduce students of various backgrounds and majors to some of the most fundamental concepts of human genetics. The concepts will be linked to current events and contemporary societal issues as much as possible to help highlight the relevancy of the information. With the accelerated pace of genetic discoveries, technologies, and their ever growing impact on so many sectors of our society, it is imperative to have a genetically literate populace who are informed on the issues and can help guide judiciously on genetics related policies. Advances in personalized genomics that is at the leading edge of individualized healthcare will also require large scale education of the public on basic genetics concepts. Therefore the relevancy of this course hits at the personal, societal, and even the global levels.

Participation in class discussions is required, and reading assigned articles in advance of the class is critical for contributing to meaningful discussions.

As this is a general education course, there are certain goals that the course will aspire to achieve as described below. It is rare that any one course can achieve all these goals, but concerted efforts will be made to promote at least a few of them.

General Education Course Goals

1. **Subject Knowledge.** To provide an educational experience that will enhance student's understanding of the discipline's basic principles, methodologies, and perspectives.
2. **Communication.** To provide an educational experience that will enhance the ability to communicate.
3. **Inquiry and Critical Thinking.** To provide an educational experience that will enhance critical thinking skills and will contribute to continuous inquiry and life-long learning.
4. **Information Retrieval and Evaluation.** To provide an educational experience that will enhance the ability to find, understand, examine critically, and use information from various sources.
5. **Interdisciplinary Relationships.** To provide an educational experience that will enhance students' understanding of a discipline's interrelationships with other disciplines.
6. **Global or Multicultural Perspectives.** To provide an educational experience that will enhance the ability to look at issues from multiple perspectives and/or that will describe a discipline's impact on or connection to global issues,
AND/OR
7. **Social Responsibility.** To provide an educational experience that will help students understand the complexity of ethical judgment and social responsibility and/or that will describe the discipline's impact on or connection to social and ethical issues.

Required Texts:**Human Genetics: Concepts and Applications (2014, edition 11), by Ricki Lewis ”**

Note: The list of topics shown below will be covered in the sequence indicated, but the exact dates when they will be discussed in class may not adhere precisely to the schedule provided below.

<u>WEEK OF:</u>	<u>TOPICS</u>	<u>Readings – Lewis (Chapter)</u>
Aug. 24	What is a Human Genome?	1
Aug. 29-30	Cells (Stem cells/ Human Microbiome) Meiosis, Development, Aging Progeria/ Maternal & Paternal age effects on gametes	2 3
Sept. 5-7	Single Gene Inheritance Family exome analysis solves medical mystery	4
Sept. 12-14	INSTRUCTOR AT A PROFESSIONAL MEETING Tuesday – Attend class – form your groups to work on the “Escape room” assignment. Email the instructor the members of your group by the end of the day Thursday –No class, but must view Stem Cell video (Miracle Cells) - link provided by instructor and read New York Times article titled “In Breakthrough, Scientists Edit a Dangerous Mutation From Genes in Human Embryos”. Both available on Blackboard	
Sept. 19-21	Tuesday - Quiz on Stem cell video – 10 pts Beyond Mendel’s Laws Mitochondrial genes – discuss article “A Baby with 3 Genetic Parents...” LAST DAY TO DROP THE CLASS – September 20	5
Sept. 26-28	Matters of Sex Video: 20/20 segment on Intersex Tuesday - Reflection paper for New York Times article due – 5 pts.	6
Oct. 3-5	Exam I – (Tuesday, Oct. 3) – 50 pts Genetic Testing and Treatment Assignment: Watch video called “In the Family” – use link provided	20
Oct. 10-12	Tuesday (Oct. 10) - Quiz on “In the Family” video - 10 pts CRISPR – treatment for Huntington disease, genetically altered embryos	Assigned articles
Oct. 17-19	Chromosomes NIPT/ declining Down syndrome individuals?	13
Oct. 24-26	Reproductive Technologies Savior siblings Tuesday – Reflection paper for “In the Family” video due – 5 pts.	21
Oct. 31-Nov. 2	Multifactorial Traits Exam #2 – THURSDAY – (November 2) - 50 pts	7
Nov. 7-9	DNA structure and Replication	9
Nov. 14-16	Gene Action: From DNA to Protein Gene Mutations	10 12
Nov. 21	Gene expression and epigenetics Assignment: View epigenetics video “Ghost in your genes”	11

THURSDAY – THANKSGIVING –NO CLASS

Nov 28-30	Tuesday – Quiz – Epigenetics video- 10 pts / “Escape Room” demonstrations “Escape Room” demonstrations
Dec. 5-7	“Escape Room” demonstrations
Dec. 19	FINAL EXAM (Tuesday 11:15 – 1:15) – 50 pts.

EXAMS, CLASS ASSIGNMENTS, AND GRADING INFORMATION

1. Exams – 150 pts. total

There will be three exams in the class, each worth 50 points. The exams will include material covered in the assigned reading material, lectures, and videos if applicable. Each exam will consist of 4 sections: multiple choice, matching or True/False, essays, and problems. There will be NO make up for exams unless you contact the instructor *before* the exam is given and have a valid excuse.

2. Three Quizzes – 10 pts each

There will be an in-class quiz associated with each video that you are assigned to watch at home. The topics for each video are:

- 1) Miracle cells – discusses stem cells and their applications
- 2) In the family – a personal documentary about a woman who tests positive following a genetic test for breast cancer, and her journey through the difficult choices she needs to make, both medical and personally in the aftermath of her test results.
- 3) Ghosts in your Genes – covers the topic of epigenetics and how it can impact gene expression.

There will be no make for these quizzes unless you contact the instructor before the quiz is given and have a valid excuse..

3. Two short writing assignments – 5 pts. each

There will be two short writing assignments, each worth 5 pts. Each paper should describe your personal reflections and thoughts about what was discussed in the article or video. It should be 2 pages in length, 12 point font, with one inch marginal on all sides. The Reflection papers will be in response to:

- 1) New York Times article titled “In Breakthrough, Scientists Edit a Dangerous Mutation From Genes in Human Embryos”, August 2, 2017
Paper due = September 26
- 2) Video titled “In the Family”
Paper due = October 24

4. The Escape Room Project – 40 pts.

This is an experimental assignment that will involve working in groups comprised of 6 students meeting throughout the semester to create a genetics theme based Escape Room scenario. The majority of the clues and answers have to be genetics related in order to solve all the steps and finally escape the room before time runs out. Time will run out in 20 mins. Examples of some clues will be provided in class. The last 1 ½ - 2 weeks of the semester will be devoted to each group displaying their Escape room, with all their props, and letting volunteers from the rest of the class get locked in and attempt to escape. Video and audio connection to the room will provided through Zoom and a laptop installed in the room. Locations of the rooms will be provided much later in the semester More on the rubrics of what needs to be included in the project will be provided a little later.

5. PROBLEMS AT THE END OF THE CHAPTERS

You are highly encouraged to answer the questions at the end of each chapter. However, you are not required to hand anything in to me documenting your efforts.

6. GRADING SYSTEM

The total maximum number of points from all categories (exams, quizzes, project) is 230 pts.

This course may be taken for a letter grade or credit/no credit. You can opt for the credit/ no credit grading on the registration form, or by changing your Registration Option Form at least ONE week before the last day of our class meeting (Dec. 7). Otherwise you will receive a letter grade if that is what you signed up for. No exceptions will be made. The grading system is as follows:

93.5-100%	= A
90-92%	=A-
87-89.5%	=B+
83.5-86.5%	=B
80-83	=B-
77-79.5%	=C+
73.5-76.5	=C
70-73%	=C- (minimum score needed for Credit)
67-69.5%	=D+
63.5-66.5	=D
60-63%	=D-
<60%	=F