

Course Information

Course Number: BIMS/GENE 320
Course Title: Biomedical Genetics
Section: 550
Time: Times will vary do the nature of this education abroad experience.
Location: via Zoom or In-person class meets at the TAMU Soltis Center, Costa Rica
Credit Hours: 3

Instructor Details

Instructor: James Derr, Ph.D.
Office: 307 VRB 1197
Phone: 979-574-5915
E-Mail: jderr@cvm.tamu.edu
Office Hours: By appointment

Course Description

Fundamental genetic principles as applied to biomedical science; Mendelian inheritance, linkage and genetic mapping, mutagenesis and pedigree analysis; molecular basis of gene function and inherited disease; gene therapy and genetic counseling. Credit cannot be given for both GENE 301 and GENE 320.

Course Prerequisites

Junior or senior classification; BIMS major with a minimum overall 2.5 TAMU GPA

Course Learning Outcomes

1. Refine the concepts of the genetic unit by tracing the development of the gene from a visible trait, to a location on a chromosome (locus) to a nucleotide sequence.
2. Develop methods to predict the genotype and phenotype of members of a pedigree or cross.
3. Develop the concept that the phenotype of an individual results from the interaction of genes which are influenced by the environment.
4. Analyze the arrangement of genes on chromosomes and the altered genetic behavior that results from changes in chromosome structure and number.
5. Describe the biochemical basis of heredity and use newly acquired understanding of gene and chromosome mutations to genetically dissect the normal or "wild type" condition.
6. Give examples of genetic manipulation and engineering in agriculture, medicine, and industry.
7. Analyze the behavior of alleles in populations and the phenomena which govern allelic and genotypic frequencies.
8. Discuss human genetics in term of genomics, diversity, evolution, forensics and gene therapy.

Textbook and/or Resource Materials

Human Heredity, Principles and Issues 11th (Michael R. Cummings)

Grading Policy

- Ten quizzes are required during the course (10 points each with the lowest two scores dropped) (80 points). Quiz dates/times announced in class.
- A written report 1000 – 1250 words (total including references) on an approved current topic of personal interest in biomedical genetics. Deadline to approve is Wednesday October 16th and the final report is due on Wednesday October 30th (50 points).
- Ten-minute PowerPoint presentations on your essay subject will be scheduled for October 21st and 22nd. (20 points).
- The Final Exam (100 total points) is optional and to be determined the week of November 8th.
- Total points for course 150 (or 250 if you take the final exam).
- Total points: >90% A, 80%– 89.5% B, 70% – 79.5% C, 60% – 69.5% D

Late Work Policy

No work will be accepted late without instructor approval.

Course Schedule

Lectures: A tentative list of lectures.	Chapter
Overview of the Course and Expectations	1
Cells, Chromosomes and Cell Division	2
Transmission Genetics	3
Pedigree Analysis	4
Interaction of Genes and the Environment	5
Cytogenetics	6
Development and Sex Determination	7
DNA Structure and Chromosome Organization	8
Gene Expression	9
Proteins and Phenotypes	10
Mutation and Mutagenesis	11
Genes and Cancer	12
Biotechnology and Society	14
The Human (and other species) Genome Project(s)	15
Reproductive Technology, Gene Therapy and Counseling	16
Genes and the Immune System	17

Genetics of Behavior	18
Population Genetics and Human Evolution	19

Important Dates

Zoom lectures on: Aug. 23, 25, 27, 30, Sep. 1, 3, 15, 17

In-person (Costa Rica-Soltis Center) lectures on: Oct. 13, 14, 15, 18, 19, 20, 21, 22
 1.5-hour lectures

Wednesday October 16th	Final date for written topic approval
Tuesday October 21st and 22nd	PowerPoint presentations
Friday October 29th (5:00pm)	Final written report due
The week of Nov. 8st (TBD)	Optional Final Exam

Attendance Policy

In order to do well in this course, it is important that you attend all lectures. The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments. Please refer to [Student Rule 7](#) in its entirety for information about excused absences, including definitions, and related documentation and timelines.

Makeup Work Policy

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor.

Please refer to [Student Rule 7](#) in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor" ([Student Rule 7, Section 7.4.1](#)).

"The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence" ([Student Rule 7, Section 7.4.2](#)).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (See [Student Rule 24](#).)

Academic Integrity Statement and Policy

"An Aggie does not lie, cheat or steal, or tolerate those who do."

"Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to

authenticate one's work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case" ([Section 20.1.2.3, Student Rule 20](#)).

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at aggiehonor.tamu.edu.

Americans with Disabilities Act (ADA) Policy

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact the Disability Resources office on your campus (resources listed below) Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.

Texas A&M at College Station

Disability Resources is located in the Student Services Building or at (979) 845-1637 or visit disability.tamu.edu.

Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see [University Rule 08.01.01.M1](#)):

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, a person who is subjected to the alleged conduct will be able to control how the report is handled, including whether or not to pursue a formal investigation. The University's goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need.

Texas A&M at College Station

Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with [Counseling and Psychological Services \(CAPS\)](#).

Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's [Title IX webpage](#).

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Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student's academic success and overall wellbeing. Students are encouraged to engage in healthy self-care by utilizing available resources and services on your campus

Texas A&M College Station

Students who need someone to talk to can contact Counseling & Psychological Services (CAPS) or call the TAMU Helpline (979-845-2700) from 4:00 p.m. to 8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at suicidepreventionlifeline.org.