BIOL 102: HUMAN GENETICS

Citrus College Course Outline of Record

Heading	Value
Effective Term:	Spring 2022
Credits:	3
Total Contact Hours:	54
Lecture Hours :	54
Lab Hours:	0
Hours Arranged:	0
Outside of Class Hours:	108
Strongly Recommended:	ENGL 101; Elementary algebra or higher or direct placement based on multiple measures.
District General Education:	B1. Natural Sciences - Life Sciences
Transferable to CSU:	Yes
Transferable to UC:	Yes - Approved
Grading Method:	Standard Letter

Catalog Course Description

General principles of genetics and reproduction in wellness and disease as applied in humans. Topics include Mendelian inheritance, variations on Mendelian inheritance, multifactorial traits, DNA structure, function, and replication, cell division, population genetics, evolution, immunity, cancer, and genetic technologies. 54 lecture hours.

Course Objectives

- Articulate the laws of genetics using scientific terminology
- Calculate estimated genotypic and phenotypic frequencies as they pertain to Mendelian and variations of Mendelian genetics
- Explain the basic principles of genetics and reproduction as applied to humans
- Examine genetic variations (chromosomal and molecular).
- Demonstrate an understanding of the basic principles of probability and critically apply them to the analysis of simple genetics problems
- Explain how some traits are the result of both genes and environment
- Articulate the role that genetics plays in human health and evolution

Major Course Content

1. Cellular structure and reproduction
2. Mendelian inheritance
3. Variations on Mendelian inheritance
4. Multifactorial traits
5. Genetics of Behavior
6. DNA structure and replication
7. DNA expression and epigenetics
8. Gene mutation
9. Chromosomes
10. Population genetics
11. Human evolution
12. Genetics of immunity
13. Genetics of cancer
14. Genetic technologies

Suggested Reading Other Than Required Textbook

Students read and review prepared lecture presentations that are available on the Citrus College LMS.

Examples of Required Writing Assignments

Students are asked to answer short answer questions on exams. Following are examples of these short answer questions:
1. Behavior is a complex mixture of emotions, moods, intelligence, and personality that influences the way we function on a daily basis. Behavior is largely dependent upon signals between neurons within the nervous system. Explain how both genetics and the environment control behavior in humans.
2. The human genome only contains about 20,300 protein-producing genes. However, humans are capable of producing many more than 20,300 proteins. Explain how a single gene can result in the production of more than one specific protein.

Examples of Outside Assignments

Students are required to turn in answers to homework questions pertaining to the course material. The homework is submitted via the Citrus College LMS and is screened for plagiarism using available LTIs (Turn-it-in). Examples of homework questions are below.
1. What is genetics? How is genealogy different from genetics? 2. Do inherited traits only include physical traits that we can see? If not, what are some other types of inherited traits? 3. What are genes, and what do they code for? 4. How many copies of a gene do most cells have? 5. Genetics considers the transmission of information at several levels. Describe these levels. 6. What does DNA stand for? What does RNA stand for? What are the four building blocks of DNA? 7. What is Proteomics? 8. Approximately how many protein-coding genes are in the human genome? 9. What percent of our DNA codes for proteins? What are functions of the rest? 10. What is a mutation? How are mutations passed from one generation to the next? 11. Are mutations good, bad or neutral? Why? 12. What is polymorphism? How do polymorphisms arise? 13. Do all cells express the same amount of protein? Explain. 14. How many chromosomes does each human somatic cell contain? How many autosomes? How many sex chromosomes?

Instruction Type(s)

Lecture, Online Education Lecture

IGETC Area 5: Physical and Biological Sciences

5B. Biological Science