

CATALOG INFORMATION

Dept and Nbr: BIO 20

Title: HUMAN GENETICS

Full Title: Human Genetics

Last Reviewed: 10/22/2018

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	17.5	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade or P/NP

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

Catalog Description:

Mechanisms of heredity, with applications to human populations, including medical genetics.

Prerequisites/Corequisites:

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:

Description: Mechanisms of heredity, with applications to human populations, including medical genetics. (Grade or P/NP)

Prerequisites/Corequisites:

Recommended:

Limits on Enrollment:

Transfer Credit: CSU;UC.

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	Area		Effective:	Inactive:
	C	Natural Sciences	Fall 2020	
	C	Natural Sciences	Fall 1981	Summer 2011
CSU GE:	Transfer Area		Effective:	Inactive:
	B2	Life Science	Fall 2020	
	B2	Life Science	Fall 1981	Summer 2011
IGETC:	Transfer Area		Effective:	Inactive:
	5B	Biological Sciences	Fall 2020	
	5B	Biological Sciences	Fall 1981	Summer 2011
CSU Transfer:	Transferable	Effective:	Fall 1981	Inactive: Summer 2011
UC Transfer:	Transferable	Effective:	Fall 1981	Inactive: Summer 2011

CID:

Certificate/Major Applicable:

Not Certificate/Major Applicable

COURSE CONTENT

Outcomes and Objectives:

A successful student in Biology 20 should be able to:

- 1) Describe and explain basic biochemistry for biology, including the structure and functions of major biological molecules.
- 2) Describe and explain cellular organization and structure.
- 3) Describe the role and chemistry of chromosomes, DNA, and RNA in cell function and information transfer.
- 4) Describe and explain an understanding of cellular replication/duplication by means of the process of meiosis and mitosis.
- 5) Describe and explain an understanding of the relationships between genotypes and phenotypes and genetic expression.
- 6) Describe and explain basic Mendelian inheritance and patterns of Mendelian pedigrees.
- 7) Describe and explain mutation and its relationship to genetic disease.
- 8) Apply principles of genetics to gene frequencies in populations.
- 9) Describe and explain genetics as applied to the concepts of human diversity, twinning, cancer, and genetic counseling.
- 10) Construct and analyze simple karyotypes.
- 11) Describe and explain recent advances in genetics such as recombinant DNA, genetic engineering, and the human genome project.

Topics and Scope:

1. History of genetics.
2. Cell structure.
3. Cell function as applied to genetics.

4. Information machinery of the cell.
 - a. the nucleus: structure, DNA, RNA.
 - b. the chromosomes: structure and function.
 - c. protein synthesis.
5. Communication between generations.
 - a. mitosis
 - b. meiosis
6. Genotype vs Phenotype.
 - a. loci vs. alleles.
7. Sex chromosomes.
 - a. sex determination.
 - b. human sex ratios.
 - c. sex linkage.
 - d. abnormalities of sex chromosomes.
8. Gene Interaction.
 - a. genetic ratios.
 - b. crossing over.
 - c. lineage.
 - d. mosaics.
 - e. cytoplasmic inheritance.
9. Polygenic systems.
 - a. the normal distribution.
10. Mutation - genetic disease.
 - a. types
 - b. rates
 - c. macro vs. micro mutation
 - d. causes
 - e. human examples - case studies
11. Human diversity.
 - a. differences in gene frequencies
 - b. twins
 - c. race
 - d. population structure
12. Recent developments in genetics.
 - a. recombinant DNA
 - b. genetic engineering
 - c. the human genome project

Assignment:

1. Reading in textbooks and scientific journals.
2. Problem sets.
3. Chromosome karyotype analysis.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Written homework, Essay exams	Writing 20 - 50%
Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.	
Homework problems	Problem solving 10 - 60%
Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.	
None	Skill Demonstrations 0 - 0%
Exams: All forms of formal testing, other than skill performance exams.	
Multiple choice, True/false, Matching items, Completion	Exams 10 - 60%
Other: Includes any assessment tools that do not logically fit into the above categories.	
None	Other Category 0 - 0%

Representative Textbooks and Materials:

HUMAN GENETICS: AN INTRODUCTION TO THE PRINCIPLES OF HEREDITY, 2nd ed.,
by S. Singer, W.H. Freeman Co., 1995
HUMAN GENETICS: CONCEPTS AND APPLICATIONS, by R. Lewis, Wm. C. Brown
Publishers, 1993