

**BIO 13 Course Outline as of Spring 2022****CATALOG INFORMATION**

Dept and Nbr: BIO 13

Title: HUMAN BIOLOGY

Full Title: Human Biology

Last Reviewed: 1/25/2021

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	6	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:**

Survey course primarily for students not majoring in biological sciences, presenting topics from biology dealing specifically with humans. Topics include cellular biology, genetics, anatomy and physiology, reproduction, evolution, and human impacts on the environment. Not an anatomy and physiology course.

**Prerequisites/Corequisites:****Recommended Preparation:**

Eligibility for ENGL 1A (or ESL 10) or equivalent or appropriate placement based on AB705 mandates

**Limits on Enrollment:****Schedule of Classes Information:**

Description: Survey course primarily for students not majoring in biological sciences, presenting topics from biology dealing specifically with humans. Topics include cellular biology, genetics, anatomy and physiology, reproduction, evolution, and human impacts on the environment. Not an anatomy and physiology course. (Grade or P/NP)

Prerequisites/Corequisites:

Recommended: Eligibility for ENGL 1A (or ESL 10) or equivalent or appropriate placement based on AB705 mandates

Limits on Enrollment:

Transfer Credit: CSU;UC.

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

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>		Effective:	Inactive:
	C	Natural Sciences	Fall 1981	
<b>CSU GE:</b>	<b>Transfer Area</b>		Effective:	Inactive:
	B2	Life Science	Fall 1981	
<b>IGETC:</b>	<b>Transfer Area</b>		Effective:	Inactive:
	5B	Biological Sciences	Fall 1981	
<b>CSU Transfer:</b>	Transferable	Effective:	Fall 1981	Inactive:
<b>UC Transfer:</b>	Transferable	Effective:	Fall 1981	Inactive:

**CID:**

**Certificate/Major Applicable:**

Major Applicable Course

## **COURSE CONTENT**

**Student Learning Outcomes:**

At the conclusion of this course, the student should be able to:

1. Apply the scientific method and critical thinking techniques to evaluate biological information from the popular media.
2. Apply information about biological processes to human health issues.
3. Investigate the impacts of human population growth and resource use on the environment and human species.

**Objectives:**

At the conclusion of this course, the student should be able to:

1. Describe the structure of atoms, molecules, and biological polymers, and relate their significance to cell structure and function, anatomy, physiology, genetics and evolution.
2. Relate knowledge of cell structure to metabolism, cell respiration and organ function.
3. Examine structures and functions of cell membranes.
4. Compare and contrast methods of cellular reproduction (mitosis and meiosis) and their significance.
5. Explain how DNA codes for proteins, how the code is translated by the cell, and the relationship of genes to specific traits and inheritance.
6. Compare and contrast the different inheritance patterns observed in human traits, and analyze these patterns using pedigrees.
7. Compare and contrast the structures and functions of human tissues, organs, and organ systems.
8. Describe the mechanisms of evolution, adaptation, and speciation.
9. Relate the principles of genetics to the processes of evolution.

10. Differentiate scientific reasoning and facts from other ways of constructing beliefs.
11. Evaluate the impacts of human population growth and resource use, as a whole and by country, on the environment and the human species.
12. Describe and objectively analyze current news and research on human biology.

## **Topics and Scope:**

### **I. Scientific Method**

### **II. Cell Biology**

#### **A. Cell chemistry**

1. Atomic structure
2. Molecular bonding
3. Acids/bases/pH
4. Macromolecule structure and function
5. Enzyme structure and function

#### **B. Cell structure and ultra structure**

1. Eukaryotic cell organelles and their functions
2. Cell membrane structure and transport functions

#### **C. Cell respiration**

1. Chemical equation, including relationship of reactants and products to organ systems
2. Importance of ATP
3. Aerobic vs. anaerobic respiration

#### **D. Cellular reproduction**

1. Mitosis
2. Meiosis including sources of genetic variation

### **III. Molecular Genetics**

#### **A. DNA replication**

#### **B. Protein synthesis**

#### **C. Mutations and mutagens**

#### **D. Changes in chromosome number and chromosome structure**

### **IV. Transmission Genetics**

#### **A. Mendelian genetics**

1. Monohybrid and dihybrid crosses
2. Autosomal and sex-linked human genetic disorders

#### **B. Post-Mendelian genetics**

1. Incomplete dominance and co-dominance
2. Polygenic inheritance
3. Sex-influenced traits

#### **C. Effects of environment on genetic expression**

### **V. Human Organ Systems**

#### **A. Tissues**

1. Structure and function
2. Organization of organs

#### **B. Digestive system**

1. Structure and function
2. Diet and nutrition

#### **C. Respiratory system**

1. Structure and function
2. Effects of smoking

#### **D. Cardiovascular system**

1. Structure and function
2. Heart and degenerative vascular diseases

- E. Lymphatic system
  - 1. Circulation of lymph
  - 2. Infectious diseases, including AIDS
  - 3. Immunization
- F. Muscular and skeletal systems
  - 1. Muscle structure and function
  - 2. Bone growth and development
  - 3. Joint structure and function
- G. Nervous system structure and function
- H. Urinary system structure and function
- I. Endocrine system structure and function
- J. Reproductive system
  - 1. Structure and function
  - 2. Contraception
  - 3. Sexually transmitted diseases
- VI. Human Evolution
  - A. Mechanisms of evolution
    - 1. Natural selection
    - 2. Genetic drift and gene flow
    - 3. Mutation
    - 4. Non-random mating
  - B. Speciation and reproductive isolation mechanisms
  - C. Evidence for evolution
    - 1. The fossil record
    - 2. Comparative anatomy and physiology
    - 3. Molecular and biochemical evidence
    - 4. Observation of current populations
    - 5. Artificial selection
- VII. Human Population
  - A. Exponential growth
  - B. Carrying capacity and limiting factors
  - C. Resource use and ecological footprint
  - D. Environmental change and its affect on human well-being
- VIII. Current Research Topics in Human Biology

### **Assignment:**

- 1. Weekly reading including but not limited to scientific papers, handouts, and text assignments (10-50 pages per week)
- 2. Essay(s) (1-3) or a written term paper (6-10 double-spaced pages)
- 3. Exams including objective and essay questions (2-4 exams and 1 comprehensive final)
- 4. Quizzes (2-10)
- 5. Participation

### **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.

Essay(s) or written term paper	Writing 10 - 20%
<b>Problem Solving:</b> Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.	
None	Problem solving 0 - 0%
<b>Skill Demonstrations:</b> All skill-based and physical demonstrations used for assessment purposes including skill performance exams.	
None	Skill Demonstrations 0 - 0%
<b>Exams:</b> All forms of formal testing, other than skill performance exams.	
Quizzes and exams	Exams 70 - 90%
<b>Other:</b> Includes any assessment tools that do not logically fit into the above categories.	
Participation	Other Category 0 - 10%

### **Representative Textbooks and Materials:**

Human Biology. 11th ed. Starr, Cecie and McMillan, Beverly, Brooks/Cole. 2016 (classic)  
Human Biology. 9th ed. Chiras, Daniel. Jones and Bartlett. 2019  
Human Biology. 16th ed. Mader, Silvia and Windelspecht, Michael. McGraw Hill. 2020