University of Arkansas - Fort Smith
5210 Grand Avenue
P. O. Box 3649
Fort Smith, AR 72913-3649
479-788-7000

General Syllabus

BIOL 4453 Human Evolutionary Genetics

Credit Hours: 3 Lecture Hours: 3 Laboratory Hours: 0

Prerequisite: BIOL 3803 Genetics
Prerequisite or corequisite: BIOL 4403 Evolutionary Biology

Effective Catalog: 2018~2019

I. Course Information

A. Catalog Description

A survey of human genomics, genetics, and phylogenetics, the major events in human evolution from a population genetics perspective, and the evolution human genetic diseases.

B. Additional Information - None

II. Student Learning Outcomes

A. Subject Matter

Upon successful completion of this course, the student will be able to:

1. Solve problems using a functional knowledge of how the human genome is organized and evolves.
2. Critically evaluate the influence of each process behind the generation of genetic diversity in the human species.
3. Examine the genetic relationships between humans and other primates, and compare and contrast the traits that have evolved since their divergence from a common ancestor.
4. Evaluate uniquely human characteristics and critically evaluate current knowledge of the historical conditions during which these traits likely evolved.
5. Criticize or defend scientific conclusions emerging from paleontological, archaeological, and genetic evidence about early global dispersal of humans and pre-humans.
6. Derive the evolutionary implications of genetic diseases and pathogens using empirical data.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Analytical Skills

Critical Thinking Skills: Students will identify and analyze a problem, break it down into its component parts and use scientific method to answer biological questions.

Communication Skills (written and oral)

Students will demonstrate proficiency in communication by composing coherent arguments presented both orally and in writing.

Ethical Decision Making

Students will identify ethical dilemmas (e.g., human cloning, transgenics, eugenics, etc.) and apply ethical frameworks in discussions about these issues.

Global and Cultural Perspectives

Students will demonstrate an understanding of how humans dispersed out of Africa to occupy a global distribution, and how the development of various aspects of society and culture (e.g., communication, transportation, biotechnology, art, etc.) may influence the future evolution of humans and the global biome.

III. Major Course Topics

A. Human Genetics & Genomics
B. Molecular Evolution & Genetic Diversity
C. Extant Hominoids
    1. Orangutans, gorillas, & chimpanzees
    2. Comparisons with humans
D. Origin of Modern Humans
    1. Fossil record
    2. Out of Africa
    3. Global migration
    4. Early technological development
E. Secondary contact of human species/populations
F. Agricultural expansion
    1. Transition from hunter/gatherer groups
    2. Domestication of plants & animals
G. Cultural and technological evolution of humans