



UNC  
WORLD VIEW

## NC SCHOLAR OF GLOBAL DISTINCTION 2024

**Instructor:** Jodi Valencic Zieverink

**Department:** Science/ Biology/ Anatomy and Physiology

**Community College:** Gaston College

### **Course Description:**

This course provides a comprehensive study of the anatomy and physiology of the human body. Topics include body organization, homeostasis, cytology, histology, and the integumentary, skeletal, muscular, and nervous system and special senses. Upon completion, students should be able to demonstrate an in-depth understanding of principles of anatomy and physiology and their interrelationships.

**Number of students enrolled in course:** 24 per section, 15-20 sections per semester

### **Description of Module:**

Before beginning the study of the systems of the body, Anatomy and Physiology students will be introduced to the Middle East and North Africa as the birthplace of humanity. Students will learn the history of the region as it relates to early humans and the base of genetic diversity found across the globe. During the study of the Integumentary System, students will learn about the evolution of skin and hair by comparing the impact of the environment of equatorial regions of Northern Africa to Northern Europe.

### **Student Global Learning Outcomes:**

- Describe study of anatomy and physiology of the Integumentary System through evolution, affected by opposing environmental factors of equatorial regions of North Africa and arctic regions of Northern Europe.
- Relate the anatomical structures and development of the structures of the Integumentary System to the physiology functions of the system through the lens of evolution, comparing the environments of North Africa to the regions of Northern Europe



- Compare common disorders of the Integumentary System in between the two regions of the world.
- Students use scientific map and graph reading skills to interpret data and draw conclusions.

## Student Global Learning Activities:

### Global Learning Activity 1

- Pre-Lab Assignment
  - Objectives
    - After watching the recorded lectures for the anatomy of the Integumentary System, students will differentiate the layers of the skin and accessory structures in a diagram.
    - Students will obtain basic background information about climate and indigenous skin colors.
  - Procedures
    - After reviewing the recorded lecture regarding the Anatomical Structures of the Integumentary System, students will label key anatomical structures of the Integumentary System.
    - **Student will review the BIO 168 Prologue to the Study of Body Systems PP ([click link here](#)), and write a hypothesis statement about the relationship between UV Index, and Integumentary structures in indigenous people of the birthplace of humanity, Northern Africa and the Middle East.**
  - Assessment
    - Students will share their understanding and hypotheses with other members of their lab group at the beginning of lab.
  - Follow Up
    - Students will gather information throughout the lab to determine if their hypotheses are correct.

### Global Learning Activity 2:

[Biology of Skin Color video](#) (19 min)

- Objectives
  - Explain the cellular and molecular mechanisms that determine the color of human skin as an adaptation to the intensity of UV radiation in different parts of the world.
  - **Explain skin color in indigenous populations of North Africa and the Middle East, and how and why skin colors evolved after some early humans migrated away from this region.**



- Procedures
  - After reviewing the recorded lecture regarding the Anatomical Structures of the Integumentary System, students will watch the short video, the Biology of Skin Color from the HHMI BioInteractive website during the lab.
  - Students will take notes to use for the Homework Assignment
- Assessment
  - The video has embedded questions with pause points where the class will discuss and deepen their understanding of the concepts presented.
- Follow Up
  - The concepts from this video will be applied to subsequent activities.

### **Global Learning Activity 3**

#### Biology of Skin Color Student Worksheet/Blackboard Homework Assignment

- Objectives
  - Describe and explain why evolutionary selection pressure depends on environment.
  - Discuss why evolution may involve trade-offs.
  - Describe why human populations living for many generations in different parts of the world have different variations in certain traits.
- Procedures
  - After working through the lab, students will apply what they learned in this individual homework assignment.
  - The worksheet will be converted into a Blackboard Assignment that challenges students to apply what they learned in the video, uses critical thinking, and support their responses with evidence from the video.
- Assessment
  - The assessment will measure understanding of the content, application of the content, as well as graph and chart reading scientific skills.
- Follow Up
  - After the homework assignment is graded, students will work on the case study assignment.

### **Global Learning Activity 4**

#### Case Study Assignment

- Objectives
  - Students will be able to compare disorders of the Integumentary System by structure and function.



- Students will relate the disorders to evolution of Integumentary physiology, comparing indigenous people of Northern Africa and the Middle East to populations in other regions.
- Procedures
  - After watching the recorded lectures for the physiological topics of pigmentation, temperature regulation, vitamin D synthesis, students will work through case studies of common disorders of the Integumentary System to apply what they have learned.
  - Students will use critical thinking to draw conclusions about what they have learned about the anatomical structures and how they relate to the physiological functions of the Integumentary System as they apply to disorders that affect skin
- Assessment
  - Students will complete the Case Study Assignment independently as preparation for the Unit Exam that covers the anatomy and physiology of the Integumentary System.
- Follow Up
  - We will build on the concepts of evolution of Integumentary structures as we move through remaining body systems.

## Resources

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- Hammouda, A. Outreach Manager, Center for Middle East & Islamic Studies. University of North Carolina at Chapel Hill (November 13, 2023) Personal communication (Zoom).
- INTERSUN Global UV Project (2004). Global Solar UV Index [https://live.staticflickr.com/593/32357653495\\_a6e394ae64\\_b.jpg](https://live.staticflickr.com/593/32357653495_a6e394ae64_b.jpg)



- Jablonski, Nina G. (2012). *Living Color: The Biological and Social Meaning of Skin Color*. University of California Press.
- Pagani, L, et al. (2016) Genomic analyses inform on migration events during the peopling of Eurasia. *Nature* 538, 238–242 (2016).  
<https://doi.org/10.1038/nature19792>
- Tierney, J., deMenocal, P., Zander, P (2017). A climatic context for the out-of-Africa migration. *Geology* (11): 1023-1026. <https://doi.org/10.1130/G39457.1>
- Weather Underground (October 23, 2023) Current Global Temperatures.  
<https://www.wunderground.com/maps/temperature/global-current>
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Www.Biointeractive.org. <https://www.biointeractive.org/classroom-resources/biology-skin-color>
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[https://live.staticflickr.com/593/32357653495\\_a6e394ae64\\_b.jpg](https://live.staticflickr.com/593/32357653495_a6e394ae64_b.jpg)
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