

# **COURSE TITLE: BIOL 316 – EVOLUTION**

**WINTER 2023: Web , December 12 – January 14**

**INSTRUCTOR: Dr. Scott Grubbs, OCH G011, e-mail: [scott.grubbs@wku.edu](mailto:scott.grubbs@wku.edu)**

**OFFICE HOURS: By appointment via Zoom or e-mail**

**TEXTBOOK: Herron & Freeman, 2014. Evolutionary Analysis (5<sup>th</sup> Edition, but the older 4<sup>th</sup> Edition is fine, too)**

**LECTURE MATERIALS: Available on your BIOL 316 Blackboard site**

## **Course Description and Purpose**

Evolutionary Biology embodies a fundamental framework from which we understand the natural world and comprises two primary components:

1. The historical facts of evolution, and...
2. The theories of how evolution occurs.

Evolutionary biology is multidisciplinary, synthesizing information from geology, paleontology, chemistry, genetics, systematics, ecology, and biogeography. We will address facts (**that life has changed**) and theories of evolution (**how life has changed**). Upon completion of this course, you should be able to:

1. Describe examples of changes in life over time,
2. Identify the four major mechanisms of evolutionary change,
3. Identify the facts and inferences regarding natural selection,
4. Explain the tenets and rationale of Hardy-Weinberg equilibrium theory, and
5. Compare and contrast individuals and populations in the context of evolutionary biology.

## **Overall, the goals of this course are to:**

1. Develop a general understanding of the fact and theory of biological evolution,
2. Learn how to apply an evolutionary perspective to questions in other areas of biology, and
3. Develop an appreciation of evolutionary biology as a dynamic, rigorous, hypothesis-driven field of science.

## **Important Information**

### ***Grade Evaluation***

There will be four exams, four short summary papers, and four assignments (in development). Exams 1–4 are each worth 40 points. Exam questions will come from material from lectures, assigned readings from the textbook, and from additional assigned videos. Exams may include multiple choice, short answer, and problem-solving questions. The latter includes understanding the basic arithmetic of calculating allele and genotype frequencies. Please note that make-up exams are uncommon. You should expect to be present for all exams. To qualify for a make-up exam, you need to have contacted me prior to the exam. This is your main bargaining tool, but I reserve the right to decide if a make-up exam is afforded.

### **Tentative (= subject to change) schedule and pertinent lecture material information**

#### ***Introduction to Evolution & Evolutionary Thinking***

- Lecture 1 – Introduction to Evolution & Snapshot of History
- Lecture 2 – Snapshot of History
- Lecture 3 – Chapter 4, Phylogenies
- Lecture 4 – Chapter 2, Patterns of Evolution

**Sunday, December 18<sup>th</sup> – EXAM 1**

#### ***Mechanisms of Evolution***

- Lecture 5 – Chapter 3, Natural Selection + videos
- Lecture 6 – Chapter 5, Mutations + videos
- Lecture 7 – Chapter 6, Mutations & Selection + videos
- Lecture 8 – Chapter 7, Genetic Drift + videos

**Wednesday, December 28<sup>th</sup> – EXAM 2**

#### *Adaptation, Character Evolution, Sexual Selection & Speciation*

- Lecture 9 – Chapter 9, Quantitative Traits + videos
- Lecture 10 – Chapter 10, Adaptations
- Lecture 11 – Chapter 11, Sexual Selection + videos
- Lecture 13 – Chapter 13, Speciation

**Sunday, January 8<sup>th</sup> – EXAM 3**

#### *Systematics, History of Life, Macroevolution, & Human Evolution*

- Lecture 14 – Chapter 17, Origins & Deep Time + videos
- Lecture 15 – Chapter 18, Fossils & Macroevolution
- Lecture 16 – Chapter 20, Human Evolution

**Sunday, January 15<sup>th</sup> – EXAM 4**

Seven or eight readings from the primary literature will be assigned that focus on various aspects of evolutionary biology. You will be required to provide written four separate two-page summaries. Each summary paper is worth 20 points. I will provide detailed instructions and a written rubric.

Your final grade, determined from 240 points total, will be based on a straight scale according to WKU 10-point grading scale: A = 100-90%, B = 89-80%, C = 79-70%, D = 69-60%, F = 59-0%.

#### **Attendance**

This course will be delivered asynchronously.

#### **Academic Dishonesty**

Students are expected to do their own work throughout this course and demonstrate academic integrity. Academic dishonesty in the form of cheating or plagiarism will not be tolerated. Dishonesty on quizzes, exams, or written assignments (see WKU's plagiarism statement below) will result in a failing grade for the class. Cheating (completing an assignment for someone else, allowing someone else to copy your assignment, copying and pasting from internet sources or elsewhere when you have not been instructed that this is acceptable, etc.) on online assignments will be tracked by computer.

Please refer to the WKU Student handbook for policies and definitions regarding academic integrity at:

<http://www.wku.edu/Dept/Support/StuAffairs/StuLife/handbook/academicOffenses.htm>

**WKU'S PLAGIARISM DEFINITION: "To represent written work taken from another source as one's own is plagiarism. Plagiarism is a serious offense. The academic work of a student must be his/her own. One must give any author credit for source material borrowed from him/her. To lift content directly from a source without giving credit is a flagrant act. To present a borrowed passage without reference to the source after having changed a few words is also plagiarism."**

#### **Classroom Behavior**

My policy is simple: be on time and help create a positive learning environment free of distractions. This course is a restricted elective for biology majors and needs to be treated with respect. Food and sleeping are prohibited. **This is also a tobacco-free classroom, including all forms of chewing tobacco.** Students unwilling to abide by my policy will be asked to leave the classroom.

#### **Drop and Withdrawal Dates**

Be aware of the dates to drop and receive refunds. This is your responsibility, if you so choose, to drop the class in a timely manner.

#### **Civility**

All students are expected to abide by the Code of Student Conduct

<https://www.wku.edu/studentconduct/student-code-of-conduct.php>

***Students with Disabilities – ADA Accommodation***

In compliance with University policy, students with disabilities who require academic and/or auxiliary accommodations for this course must contact the Student Accessibility Resource Center (SARC) located in Downing Student Union, 1074. SARC can be reached by phone number at 270-745-5004 [270-745-3030 TTY] or via email at [sarc.connect@wku.edu](mailto:sarc.connect@wku.edu) . Please do not request accommodations directly from the professor or instructor without a faculty notification letter (FNL) from The Student Accessibility Resource Center.

***Title IX/Discrimination & Harassment***

Western Kentucky University (WKU) is committed to supporting faculty, staff and students by upholding WKU's Title IX Sexual Misconduct/Assault Policy (#0.2070) at:

<https://wku.edu/eoo/documents/titleix/wkutitleixpolicyandgrievanceprocedure.pdf> and

Discrimination and Harassment Policy (#0.2040) at

[https://wku.edu/policies/hr\\_policies/2040\\_discrimination\\_harassment\\_policy.pdf](https://wku.edu/policies/hr_policies/2040_discrimination_harassment_policy.pdf).

Under these policies, discrimination, harassment and/or sexual misconduct based on sex/gender are prohibited. If you experience an incident of sex/gender-based discrimination, harassment and/or sexual misconduct, you are encouraged to report it to the Title IX Coordinator, Andrea Anderson, 270-745-5398 or Title IX Investigators, Michael Crowe, 270-745-5429 or Joshua Hayes, 270-745-5121. Please note that while you may report an incident of sex/gender-based discrimination, harassment and/or sexual misconduct to a faculty member, WKU faculty are "Responsible Employees" of the University and MUST report what you share to WKU's Title IX Coordinator or Title IX Investigator. If you would like to speak with someone who may be able to afford you confidentiality, you may contact WKU's [Counseling and Testing Center](#) at 270-745-3159.

***RSI (Regular and Substantive Interaction) statements***

In this course, regular and substantive interaction will take place in the following ways:

- Replies to e-mails with 24-48 hours,
- Regular announcements, and
- Timely and detailed feedback on assignments provided within 24-48 hours of submission.