BIOL-T591
A History of Life
Spring 2019

Course Instructor:

Dr. Michael S. Finkler
Office: IU Kokomo SM 139D
(765) 455-9244 mfinkler@iuk.edu
Campus Office Hours:
Virtual Office Hours:

Description:

This graduate-level online seminar course is an examination of two dimensions of the history of life on Earth. One of these is an overview of the evolutionary history of life on the planet based on the fossil record and within the genetic codes of existing organisms. The other is an exploration of how the scientific view of biological evolution has developed over the last two centuries, from creation story-based views of the origin of life to the modern non-teleological theory of evolution through natural selection. We will also discuss the continued, and often heated, debate between these two views of life's origins and history, and the social, political, and educational consequences of this continued clash of worldviews.

Learning Outcomes:

With enrollment in this course, students will…

- Demonstrate the ability to break down and analyze biological concepts for undergraduate students
- demonstrate an achievement of depth of knowledge across a selection of subdisciplines in biology
- develop arguments supported by appropriate scientific evidence and reasoning
- evaluate the strengths and weaknesses of different perspectives
- communicate the relevance of biological principles for society in oral and written format
- critically evaluate their own ideas, arguments, and perspectives

Required text readings (additional articles will be posted on Canvas):

- William Paley. *Natural Theology.* (Complete text posted on Canvas)
    - Paley's *Natural Theology (1802)* is an excellent example of a creation-based view of life in the natural world. The work introduces one of the greatest metaphors in the philosophy of science—God as "the Watchmaker". Paley's concepts remain key

components of modern creationist arguments against evolution through natural selection.

- Charles Darwin. *The Origin of Species*. (Complete text posted on Canvas)
    - Darwin's *The Origin of Species* is simultaneously one of the most praised and one of the most maligned literary works in human history. The effect of this work on human society over the last 150 years has been profound to say the least. However, the actual ideas presented in this work are often misinterpreted and misquoted. The importance of Darwin (and Wallace's) concept of evolution through natural selection is that it is inherently non-teleological - evolution of organisms does not have a philosophical purpose or meaning, but simply occurs because some members of a population happen to produce more offspring than do others, and thus their characteristics are preferentially passed on to the next generation.

- Richard Fortey. *Life: A Natural History of the First Four Billion Years of Life on Earth*.
    - Fortey, an invertebrate paleontologist, provides this excellent overview of the history and diversity of life forms since their estimated origins some 3.8 billion years ago.

- Sean B. Carroll. *The Making of the Fittest.*
    - Carroll, a leading researcher in the field of evolutionary developmental biology, presents an excellent overview of how genetic evolution, in conjunction with morphological evidence gleaned from the fossil record, shape the current scientific views of biological evolution.

- Neil Shubin. *Your Inner Fish*
    - Shubin's bestselling volume explores the evolutionary, anatomical, and genetic connections linking the human body to those of other living organisms.

- Eugenie C. Scott. *Evolution vs. Creationism: An Introduction (2nd ed)*.
    - The debate between creation and evolution is as old as the concept of evolution itself. In many respects, the arguments presented by creationists are little different from arguments made in the 19th century, although the ideas have been adapted to account for new discoveries (e.g., genetics, molecular biology, etc.). I include this book in order to contrast modern theology-based views of the origin and history of life on Earth and the current scientific views of the theory of evolution.

Course Grades and Assignments:

Course grades will be evaluated on a standard +/- scale (93+% = A, 90-93% = A-, etc.), and will be based on the following items:

Discussions	25%
Response papers (5)	50%
Course project	25%

- *Discussions:*
  We will conduct a series of weekly student-led online discussions throughout the semester. Depending on the schedules of the students, discussions will be conducted using a "post board" approach (with written, audio, and video posts) or through live video conference. One student in each group will serve as the facilitator for a given week, and will be responsible for formulating a series of open-ended questions to guide the discussion. Specific guidance on how to formulate questions, how to manage discussions, etiquette, etc. will be provided, as will grading rubrics for peer evaluation of discussions and instructor grading.

- *Response papers:*
  Students are to write a 5-7 page response paper upon completing each book. The paper should address 3-4 key points that were presented in the book, both providing a synopsis of those concepts as presented by the author and including the student's own responses and commentary in light of their discussions with their groups. As in any good paper, the topics addressed in the paper should be interconnected to form a cohesive whole. Clearly written text with appropriate grammar and syntax, citation of ideas, etc. is expected. Moreover, as the course progresses, the response paper should incorporate and compare the ideas of each newly-read book with ideas presented in previous books read within the course.
  Each response paper needs to be uploaded to the posted assignment on Canvas no later than the due date listed. A 20% grade penalty on the assignment will be assessed for each day late.

- *Course project:*
  Each student will also complete a course project which they examine some topic related to evolution of life on Earth or the development of ideas and philosophies concerning the evolution of life. The specific topic is open, but must incorporate at least two of the assigned books for the course AND at least five additional scholarly references (scholarly books or articles from scholarly journals), at least three of which should be biology-based. Each student will need to create and deliver a 15-minute online presentation of their project. The presentation must be posted by the beginning of the last week of the course. A 5-7 page paper based on the presentation will also be submitted. A 25% grade penalty on the assignment will be assessed for each day late.

Tentative Calendar:

Reading	**Time Interval**
Paley – *Natural Theology*	Week 2
Darwin – *The Origin of Species*	Week 3-4
Fortey – *Life*	Weeks 5-6
Carroll – *The Making of the Fittest*	Weeks 7-8

Shubin – *Your Inner Fish*	Weeks 9-10
Scott – *Evolution vs. Creationism*	Weeks 11-13
Course Projects	Weeks 14-15