

**UNDERGRADUATE COURSE CHANGE
NON-GENERAL EDUCATION**

Proposal for a Course Change

Department Biological and Environmental Sciences **Submission Date** 8/19/2015
Semester of Implementation Fall 2016

I. Proposed Course Change Information

| | CURRENT | Check Box if no Change | PROPOSED CHANGE |
|-------------------|------------------|-------------------------------------|-----------------|
| Discipline Prefix | <u>BIOL</u> | <input checked="" type="checkbox"/> | _____ |
| Course Number | <u>399</u> | <input checked="" type="checkbox"/> | _____ |
| Course Title | <u>Evolution</u> | <input checked="" type="checkbox"/> | _____ |
| Credit Hours | <u>3</u> | <input type="checkbox"/> | <u>4</u> |

If yes, attach a justification for the change in credit hours and copies of current and proposed syllabi.

May this course be repeated for credit when content changes?

Yes No Maximum hours? _____

Prerequisites BIOL 324 and BIOL 341 Prerequisite or may be taken concurrently: BIOL 288 or permission of instructor

Speaking Intensive No _____

If adding a speaking intensive designation, attach a copy of the department speaking intensive policy to the proposal.

Writing Intensive Yes _____

If Cross-Listed:

Secondary Prefix N/A _____

Course Number N/A _____

Current Course Description:

BIOL 399. Evolution. A study of the basic processes of organic evolution including the historical development of evolutionary theory, sources of variation, adaptation, natural selection, speciation, the fossil record, biogeography, and major steps in evolution. Prerequisites: BIOL 324 and BIOL 341. 3 lecture periods. 3 credits. WR.

Proposed New Course Description (**Must match description on course syllabus**):

BIOL 399. Evolution. This course examines the principles of organic evolution and the patterns generated by evolutionary processes. Topics include: hypothesis testing in evolutionary biology, origins of variation and novelty, natural selection, molecular evolution, evolutionary development, speciation, and major transitions in evolutionary history. Prerequisite or may be taken concurrently: BIOL 288, or permission of instructor. 3 lecture and one 2-hour lab periods. 4 credits. WR.

Delete Course from Catalog

Submit to Storage

Please attach a proposed syllabus in Longwood format that contains proposed changes.

II. Required for Major, Minor, Concentration (please specify):

For catalogs prior to Fall 2016, this course is required for all Biology majors. This course also counts toward the Biology minor.

Beginning with the 2016-2017 catalog, this will be one of the course options in the “ecology/evolution pillar” or may count as an additional elective for the Biology Major. This course may also continue to be selected to fulfill requirements for the Biology minor.

III. Rationale for Proposed Changes:

- 1) The restructuring of the biology curriculum includes a sophomore-level Ecology & Evolution course (BIOL 251) that will introduce students to the fundamental concepts in Evolution. Thus, this course is being re-configured to build upon that foundation to create a more advanced course.
- 2) The changes in prerequisites are reflective of the change to the entire program that will remove BIOL 121 and 122 as introductory courses and places BIOL 288 as the “gateway” to upper-level courses and will allow students to take courses other than BIOL 341 as introductions to ecological concepts.

IV. Resource Assessment, if change warrants it:

- A. How frequently do you anticipate offering this course?

Once every two years, on average

B. Describe anticipated change in staffing for the course:

None

C. Estimate the cost of new equipment required due to change:

None

D. Estimate the cost of and describe additional library resources:

None

E. Will the change in the course require additional computer use, hardware or software?

Yes No

If yes, please describe and estimate cost:

F. Will a new or changed course fee be assessed? Yes No

If yes, the Fee Recommendation Worksheet must accompany this form. It is found at the following url: www.longwood.edu/budget

**SIGNATURE PAGE
UNDERGRADUATE COURSE CHANGE
NON-GENERAL EDUCATION**

Course Name/Number BIOL 399 Course Title Evolution

V. Approvals

| | Date Received | Date Approved | Signature |
|--|---------------------|---------------|-----------|
| 1. Department Curriculum Committee Chair | _____ | _____ | _____ |
| 2. Department Chair | _____ | _____ | _____ |
| The Department Chairs, whose programs may be affected, have been notified: | | | |
| Department _____ | Date Notified _____ | | |
| Department _____ | Date Notified _____ | | |
| Department _____ | Date Notified _____ | | |
| 3. College Dean | _____ | _____ | _____ |
| 4. College Curriculum Committee | _____ | _____ | _____ |
| 5. #EPC | _____ | _____ | _____ |
| 6. #Faculty Senate Chair | _____ | _____ | _____ |
| 7. Date received by Registrar | _____ | | |

#EPC & Senate approval required for change in credit hours

All curriculum proposals/changes are processed in the date order received. In order to be included in the next academic year's catalog, all paperwork must be submitted no later than:

**February 1st to the College Curriculum Committee
March 1st to the Educational Policy Committee (EPC)**

Submission within the deadlines does not guarantee processing in time for the next academic year's catalog.

**LONGWOOD UNIVERSITY
FEE RECOMMENDATION WORKSHEET**

Prepare a worksheet for each change to an approved fee or a request to establish a new fee.

1. Fee Title:

BIOL 399 Evolution Lab fee

2. Describe the change to an approved fee or request to establish a new fee:

Inclusion of the standard lab fee to accompany the change in BIOL 399 from a lecture only 3 credit course to a 4-credit science lab course.

3. For the proposed fee, provide the following information:

- a. Currently approved fee amount:
- b. Recommended new fee amount:
- c. Budget unit to which fee will be deposited:
- d. Revenue collected in current fiscal year:
- e. Estimated revenue for upcoming fiscal year:
- f. Rationale for upcoming fiscal year estimate:
(include information such as anticipated increased fee amount and other variables such as changed participation, enrollment, etc.)

- a. None; this is a new course
- b. \$30 (the standard fee for other 4-credit science courses)
- c. BES lab fee budget, 1-11251
- d. Not applicable; new laboratory section added to existing lecture-only course
- e. Estimated revenue of \$720/semester taught
- f. One section, capped at 24 students, with lab fee of \$30 per student.

g. Do you recommend the increased revenue be shared among various units?

No

Yes

If yes, provide rationale:

If yes, provide recommended revenue distribution.

| | % | Amount |
|-------------------|-------|--------|
| Department Share | _____ | _____ |
| College/Activity | _____ | _____ |
| Share: | _____ | _____ |
| University Share: | _____ | _____ |
| Other: | _____ | _____ |

APPROVALS:

Dean _____

Vice President, Academic Affairs _____

NEW SYLLABUS

BIOL 399 • Evolution

Fall 2016

Lecture: MWF 10:00-10:50 • Chichester G12

Labs: T 11:00-12:40 • Chichester 210

Instructor: Adam Franssen, PhD

Office: Chichester 304

Email: franssenra@longwood.edu

Office phone: 395-2199

Office hours: MW 2-3:30pm; or by appointment

Course description:

BIOL 399. Evolution. This course examines the principles of organic evolution and the patterns generated by evolutionary processes. Topics include: hypothesis testing in evolutionary biology, origins of variation and novelty, natural selection, molecular evolution, evolutionary development, speciation, and major transitions in evolutionary history. Prerequisite or may be taken concurrently: BIOL 288, or permission of instructor. 3 lecture and one 2-hour lab periods. 4 credits. WR.

Introduction

The theory of evolution by natural selection is the unifying theme of biology and it has withstood rigorous scrutiny for **150 years**. As a result, the field of evolutionary biology is as broad as it is deep, covering topics as diverse as inheritance, the regulation of gene expression, genomics, population genetics, speciation and phylogeny, and global patterns of species richness. Students exploring the field of evolutionary biology can be overwhelmed by the scope of information and the degree of uncertainty, but this grandeur and possibility can (and does) also fascinate and inspire. As you explore the field of evolution, from the evolution of evolutionary theory to modern hypotheses for the emergence of *Homo sapiens*, you will most likely be overwhelmed, inspired, conflicted, and convinced; try to use the organisms, concepts, or debates that interest you to investigate organic evolution to its fullest extent.

Though I will lecture during this course, a large portion of BIOL 399 is discussion-based. This means that **your responsibility as a student is to be prepared for discussions** by reading assignments and doing your best to integrate the information you learn. I WILL call on you to offer your ideas on a given topic because I like to hear from everyone. You should not regard it as a performance test, but rather an opportunity to share your valuable insights. I welcome your thoughts regardless of whether they are the perfectly constructed answer to the questions because they help me to focus the class discussion in a way that will be most helpful to learning.

This course is also writing intensive. In addition to our normal class periods, you will be asked to integrate the basic terminology, topics of discussion, and mechanisms of evolution into multiple writing assignments. By synthesizing information and organizing your thoughts you will develop a more complete understanding of the history of evolutionary thought, the processes that govern organic evolution, and the modern debates in the field.

Required Text:

Bergstrom, CT and Dugatkin LA 2012. Evolution. Norton Publishing.

Shubin, NH 2009. Your Inner Fish. Vintage Books Publishing.

Strunk, W. and White, E.B. 1959. Elements of Style. **You can find this free online.

Canvas: A Canvas page will be created where course-related documents, including lecture slides and this syllabus will be posted. Log in at *canvas.longwood.edu*

Course learning objectives

After completion of this course, students will be able to:

- 1) Summarize the historical development of modern evolutionary theory
- 2) Describe the processes of biological evolution
- 3) Synthesize information in current media – including both peer- reviewed journal and popular press articles with “textbook” knowledge
- 4) Generate testable evolutionary-relevant hypotheses based on given information (morphological, molecular, geographic, etc.)
- 5) Write a scientific lab report including relevant figures
- 6) Explain how an strong understanding of biological evolution can be applied to modern-day issues such as global warming, mass extinction, or bacterial resistance
- 7) Work with **key computer programs** and simulations to create phylogenetic trees, analyze sequencing data, establish relationships from results of blast programs, etc.

Lecture Evaluation:

- 1) *Participation:* Learning involves much more than sitting in class and listening. It is absolutely critical that you actively participate in the process. Therefore, you will be graded on your participation. This is especially true for in and out of class discussions of relevant topics and/or review papers. **(50 points)**
- 2) *Evolution Journal Club (EJC)*
 - a. *Oral Presentation:* During the semester, we will have 5 journal club discussions; I'll present the first paper. The class will be split into 4 groups, and each group will have a chance to formally present the papers of one of the remaining EJC discussions. **(50 points)**
 - b. *Participation:* Your grade will be based on presentation quality, depth of discussion, and number/quality of questions. **(50 points)**
- 3) *Quizzes and Homework:* In the place of formal exams this semester will be weekly quizzes. Quizzes will cover textbook and companion text readings, in-class lectures, and group discussions. Quizzes may be in class or online, but will always be announced in advance. Questions may be in the form of multiple-choice, short answer, or essay. **(200 points)**
- 4) *Position Papers:* You will write four position papers during the semester that will allow you to critically evaluate an aspect of evolutionary thinking. You will have a chance to rewrite your first paper following critique. ~2-3 pages; **(50 points each; 200 points)**
- 5) *Review Paper:* One (~10 pgs.) paper on a topic of your choice will be assigned over the course of the semester. The goal of this paper is to provide you with the opportunity to investigate a topic in evolution that interests you, refine your literary search skills, and practice synthesizing, elaborating, and clarifying sometimes complex topics in a written format. Details on the paper will be provided in a separate handout.
 - a. Choose topic for term paper **(0 points)**
 - b. Sentence Outline/Annotated Bibliography **(10 bonus points)**
 - c. Rough Draft **(100 points)**
 - d. Peer Review **(50 points)**

e. Final Draft (150 points)

Lab Evaluation:

- 6) *Phylogenetic Tree from Zoo Trip Lab:* During one lab period, we will be attending the Metro Richmond Zoo. There, you will be asked to choose a group of animals, create a list of morphological characters, and create a tree. Presentation of trees and class discussion will follow. (100 points)
- 7) *Lab Report from Drosophila Lab:* You will be expected to turn in a lab report in the form of a research paper based on your findings for the term paper. You will be graded on research methods, interpretation of data, background research, and writing style. (150 points)

Estimated Summary of Points:

| Component | Point value | Percentage |
|------------------------------|--------------|-------------|
| Participation | 50 | 5 |
| Journal Club | 100 | 10 |
| Quizzes & Homework | 150 | 15 |
| Position Papers (W) | 200 | 20 (W) |
| Term Paper Annotated Outline | 0 (10 bonus) | 0 |
| Term Paper Rough Draft | 50 | 5 |
| Term Paper Peer Review | 50 | 5 |
| Term Paper Final Draft (W) | 150 | 15 (W) |
| Phylogenetic Tree | 100 | 10 |
| Lab Report | 150 | 15 (W) |
| Total | 1000 | 100% |

Grading: Your final grade will be based on the percentage of possible points you earn from the lecture exams, lab exams, quizzes, other assignments, and participation according to the following scale:

A = 100-93 A- = 90-92
B+ = 89-87 B = 86-83% B- = 82-80%
C+ = 79-77 C = 76-73 C- = 72-70
D+ = 69-67 D = 66-63 D- = 62-60 F < 60%

Students with Disabilities: If you are a student with a documented disability and believe you will need accommodations for this class, please contact Disability Support Services as soon as possible. I am happy to provide accommodations, but can do so **only** through coordination with the Disability Support Services office.

Grading system: The information below will help you understand how I will assign grades to your assignments. The italicized information is from the LU Faculty Manual. The other information is my own.

- A *The grade of “A” indicates excellence in learning and scholarship. Such scholarship should involve not only the recall of information, but also the ability to communicate the information effectively and to understand its importance and application. “A” work demonstrates creativity and application above and beyond the basic requirements of the assignment.*
- B *The grade of “B” indicates substantial mastery of the objectives of the course. “B” work must exceed all requirements of the assignment but does not demonstrate the excellence of “A” work.*

- C *The grade of “C” indicates average work. Any assignment that merely meets the requirements will receive a “C” grade. Grades above the “C” level require additional effort, creativity, thought, and application.*
- D *The grade of “D” indicates substandard work of sufficient quality and quantity to be counted toward graduation if balanced by above-average work in other courses.*
- F *The grade of “F” indicates failure to meet the objectives of the course.*

Course Policies

1. *Attendance:* attendance is a necessary part of this course. You are required to attend all class sessions and be prepared to discuss assigned reading from the texts. Attendance will be monitored on a regular basis.

- Absence from class will be excused only under the following circumstances: serious illness with a doctor’s excuse, recognizable emergency, or participation in a college-sponsored activity.
- There are no make-up quizzes without a documented excuse.
- If you miss a lecture for any reason, it is your responsibility to obtain any handouts and the information for that week’s work.
- Your final grade will be lowered by one letter if you miss **10%** of scheduled class meetings for unexcused absences.
- You will receive a course grade of “F” for missing **25%** of scheduled class meetings, excused or unexcused.
- Arrangements for missed assignments must be made no more than one week after the absence. Makeup of any work missed is purely at the discretion of the instructor.

2. *Late Assignments:* Due dates for homework and assignments will be announced in class. The grades of all assignments turned in after the due date will be reduced by 10% per class day late.

3. *Academic Honesty:* You will of course be asked to work in groups for certain assignments – that’s how science works! Discussions with classmates both in and out of class will assist you in understanding the material more clearly. However, it is expected that all written work turned in will be your own and **completely your own**. Plagiarism and sharing of answers will not be allowed. Each student will be expected to adhere to the Longwood University Honor Code.

5. *Honor Code:* Longwood’s Honor Code was created by its students and is administered by its students. Students are expected to observe the Longwood University Honor Code as specified in the Student Handbook. All exams, quizzes, and assignments handed in are considered to be pledged. Any student caught cheating on an exam or any assignment will receive a failing grade for the exam/assignment and perhaps the course at the instructor’s discretion. **All** honor code violations will be reported and are subject to university disciplinary procedures. Note: ANY use of a cell phone or other communication device during an exam or quiz is considered an Honor Code violation. Removal of quizzes or exams from the lecture room is considered an Honor Code violation.

6. *ADA Statement:* All reasonable efforts will be made to accommodate students with disabilities. If you have special needs, please discuss these with me immediately so that arrangements can be made.

Tentative Lecture Schedule

| Date | Lecture Topic | Lab Topic |
|--------|---|--|
| Week 1 | <ul style="list-style-type: none"> • Course Introduction; Philosophy of Science • REVIEW: the processes of evolution <ol style="list-style-type: none"> 1. Watch “Judgment Day: Intelligent Design on Trial” 2. Assignment: Read Chapters 1-3 of Bergstrom and Dugatkin (B&D) 3. Assignment: Choose Topic for Term Paper 4. Position Paper #1 – What is a species? | <p>Drosophila Lab I: Introduction to semester-long project demonstrating evolution of a population & genotypic fitness</p> |
| Week 2 | <ul style="list-style-type: none"> • Discuss “Judgment Day” • Adaptation, Natural Selection, and Constraint I <ol style="list-style-type: none"> 1. Assignment: Read Chapters 1-3 of Your Inner Fish (YIF) 2. Assignment: Choose topics for EJC Presentations 3. Assignment: Evolution Journal Club #1 papers: Read “Rabbits & Monkeyflowers” | <p>Natural Selection Lab: Understanding fundamental Modes of Natural Selection</p> |
| Week 3 | <p>No Class – Labor Day/Memorial Day</p> | |
| Week 4 | <ul style="list-style-type: none"> • EJC #1 – Evolutionary Processes (Presented by professor) • What is a species? Position Paper #1 Discussion • Adaptation, Natural Selection and Constraint II <ol style="list-style-type: none"> 1. Assignment: B&D Ch. 4 2. Bonus Assignment: Annotated Outline 3. Position Paper #2 – Current fossil discoveries & evolution | <p>Fossil Lab: How fossils are found, identified, understood, and what they tell us about evolution.</p> |
| Week 5 | <ul style="list-style-type: none"> • Your Inner Fish Discussion #1 – Chapters 1-3 • Phylogeny, Classification and Evolution I <ol style="list-style-type: none"> 1. Assignment: B&D Ch. 5 2. Assignment: Homework #4 (Making Cladograms) 3. Assignment: Evolution Journal Club #2 papers: Read “Spandrels” & “Snakes” | <p>Classification Lab: Using Caminacules to understand classification</p> |
| Week 6 | <ul style="list-style-type: none"> • EJC #2 – Evolutionary Processes • What are we learning from fossils? Position Paper #2 Discussion • Phylogeny, Classification and Evolution II <ol style="list-style-type: none"> 1. Assignment: Review B&D Ch. 6; Read B&D Chs. 7-8 2. Assignment: Read Chapters 4-6 of Your Inner Fish | <p>Phylogeny Lab I: Zoo Trip! Creating morphological phylogenetic trees.</p> <p><i>NOTE: For this lab your group will create a phylogenetic tree. Be ready to present in two weeks!</i></p> |

| | | |
|---------|---|--|
| Week 7 | <ul style="list-style-type: none"> • Your Inner Fish Discussion #2 – Chapters 4-6 • Evolutionary Genetics I <ol style="list-style-type: none"> 1. <i>Assignment: B&D Chs. 9-10</i> 2. <i>Turn in Rough Draft!</i> | Evolutionary Genetics Case Study: Malaria and Evolution |
| Week 8 | <ul style="list-style-type: none"> • Your Inner Fish Discussion #2 – Chapters 4-6 • Evolutionary Genetics II <ol style="list-style-type: none"> 1. <i>Assignment: B&D Ch. 11-12</i> 2. <i>Assignment: Evolution Journal Club #3 paper: Read “Self-replicating Systems”</i> | Phylogeny Lab II: Zoo Trip tree discussion. |
| Week 9 | No Class – FALL/SPRING BREAK | |
| Week 10 | <ul style="list-style-type: none"> • EJC #3 – The Beginnings of Life • Origin and Evolution of Early Life • Major Transitions <ol style="list-style-type: none"> 1. <i>Assignment: B&D Ch. 13</i> 2. <i>Homework: Origins of Multicellularity</i> 3. <i>Assignment: Read Chapters 7-9 of Your Inner Fish</i> | Molecular Evidence for Evolution I: Introduction to GENBANK Data |
| Week 11 | <ul style="list-style-type: none"> • Your Inner Fish Discussion #3 – Chapters 7-9 • Evolution and Development <ul style="list-style-type: none"> • <i>Assignment: B&D Ch. 16-17</i> • <i>Assignment: Evolution Journal Club #4 paper: Read “Sexual Selection”</i> | Molecular Evidence for Evolution II: Hypothesis testing using GENBANK Data |
| Week 12 | <ul style="list-style-type: none"> • EJC #4 – Sexual Selection • Evolution of Sex & Sexual Selection <ol style="list-style-type: none"> 1. <i>Assignment: B&D Ch. 18&20</i> 2. <i>Position Paper #3 – Extinction</i> 3. <i>Term Paper final draft due in two weeks!!</i> | Drosophila Lab II: <i>Final sampling day. Individual and class data collected and compiled</i> |
| Week 13 | <ul style="list-style-type: none"> • Human Evolution – Fossil record • Human Evolution – What species are we? <ol style="list-style-type: none"> 1. <i>Assignment: Evolution Journal Club #4 paper: “Evolutionary Medicine”</i> | Molecular Evidence for Evolution III: Hypothesis testing using GENBANK Data |
| Week 14 | <ul style="list-style-type: none"> • EJC #5 – Evolutionary Medicine • Human Evolution – Sociality <ol style="list-style-type: none"> 1. <i>Assignment: Turn in Term Paper final draft</i> 2. <i>Assignment: Read Chapters 10-Epilogue of Your Inner Fish</i> | Jelly Beans Lab: Competition |

| | | |
|---------|--|--|
| Week 15 | <ul style="list-style-type: none"> • Your Inner Fish Discussion #2 – Chapters 10-Epilogue • Human Evolution <ol style="list-style-type: none"> 1. <i>Homework: Course Evaluation</i> 2. <i>Position Paper #4 – Explaining the Importance of Understanding Evolution</i> | Outreach Lab: Communicating evolutionary concepts to non-scientists |
| Week 16 | Final Exam Period Position Paper #4 Due | |

OLD SYLLABUS

BIOL 399 • Evolution Spring 2015

Lecture: TR 6:00-8:45pm • Chichester G03

Instructor: Adam Franssen, PhD

Office: Chichester 304

Email: franssenra@longwood.edu

Office phone: 434-395-2199

Office hours: MF 9-11:30am; or by appointment

Course description:

A study of the basic processes of organic evolution including the historical development of evolutionary theory, sources of variation, adaptation, natural selection, speciation, the fossil record, biogeography and the major steps in evolution. Prerequisite: BIOL 324 and BIOL 341. 3 lecture periods (*or equivalent*). 3 credits. You must earn a 70% or better to receive writing-intensive credit.

Introduction

The theory of evolution by natural selection is the unifying theme of biology and it has withstood rigorous scrutiny for **150 years**. As a result, the field of evolutionary biology is as broad as it is deep, covering topics as diverse as inheritance, the regulation of gene expression, genomics, population genetics, speciation and phylogeny, and global patterns of species richness. Students exploring the field of evolutionary biology can be overwhelmed by the scope of information and the degree of uncertainty, but this grandeur and possibility can (and does) also fascinate and inspire. As you explore the field of evolution, from the evolution of evolutionary theory to modern hypotheses for the emergence of *Homo sapiens*, you will most likely be overwhelmed, inspired, conflicted, and convinced; try to use the organisms, concepts, or debates that interest you to investigate organic evolution to its fullest extent.

Though I will lecture during this course, a large portion of BIOL 399 is discussion- based. This means that your responsibility as a student is to be prepared for discussions by reading assignments and doing your best to integrate the information you learn. I WILL call on you to offer your ideas on a given topic because I like to hear from everyone. You should not regard it as a performance test, but rather an opportunity to share your valuable insights. I welcome your thoughts regardless of whether they are the perfectly constructed answer to the questions because they help me to focus the class discussion in a way that will be most helpful to learning.

This course is also writing intensive. In addition to our normal class periods, you will be asked to integrate the basic terminology, topics of discussion, and mechanisms of evolution into multiple writing assignments. By synthesizing information and organizing your thoughts you will develop a more complete understanding of the history of evolutionary thought, the processes that govern organic evolution, and the modern debates in the field.

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Shubin, NH 2009. Your Inner Fish. Vintage Books Publishing.

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Canvas: A Canvas page will be created where course-related documents, including lecture slides and this syllabus will be posted. Log in at canvas.longwood.edu

Course learning objectives

- 8) Summarize the historical development of modern evolutionary theory
- 9) Describe the processes of biological evolution
- 10) Synthesize information in current media – including both peer- reviewed journal and popular press articles with “textbook” knowledge
- 11) Generate testable evolutionary-relevant hypotheses based on given information (morphological, molecular, geographic, etc.)
- 12) Explain how an strong understanding of biological evolution can be applied to modern-day issues such as global warming, mass extinction, or bacterial resistance

Evaluation:

- 8) *Participation:* Learning involves much more than sitting in class and listening. It is absolutely critical that you actively participate in the process. Therefore, you will be graded on your participation. This is especially true for in and out of class discussions of relevant topics and/or review papers. **(50 points)**
- 9) *Evolution Journal Club*
 - a. *Oral Presentation:* During the semester, we will have 4 journal club discussions. The class will be split into 4 groups, and each group will have a chance to formally present the papers of one EJC for discussion. **(50 points)**
 - b. *Participation:* Your grade will be based on presentation quality, depth of discussion, and number/quality of questions. **(50 points)**
- 10) *Phylogenetic Tree from Zoo Trip:* In place of one week of class, we will be attending the Metro Richmond Zoo. There, you will be asked to choose a group of animals, create a list of morphological characters, and create a tree. Presentation of trees and class discussion will follow. **(100 points)**
- 11) *Quizzes and Homework:* In the place of formal exams this semester will be weekly quizzes. Quizzes will cover textbook and companion text readings, in-class lectures, and group discussions. Quizzes may be in class or online, but will always be announced in advance. Questions may be in the form of multiple-choice, short answer, or essay. **(200 points)**
- 12) *Position Papers:* You will write four position papers during the semester that will allow you to critically evaluate an aspect of evolutionary thinking. You will have a chance to rewrite your first paper following critique. ~2-3 pages; **(200 points; 25pts, 75pts, 100pts)**
- 13) *Review Paper:* One (~10 pgs.) paper on a topic of your choice will be assigned over the course of the semester. The goal of this paper is to provide you with the opportunity to investigate a topic in evolution that interests you, refine your literary search skills, and practice synthesizing, elaborating, and clarifying sometimes complex topics in a written format. Details on the paper will be provided in a separate handout.
 - a. Choose topic for term paper **(0 points)**
 - b. Sentence Outline/Annotated Bibliography **(10 bonus points)**
 - c. Rough Draft **(100 points)**
 - d. Peer Review **(50 points)**
 - e. Final Draft **(200 points)**

Estimated Summary of Points:

| Component | Point value | Percentage |
|------------------------------|--------------------|-------------------|
| Participation | 50 | 5 |
| Journal Club | 100 | 10 |
| Phylogenetic Tree | 100 | 10 |
| Quizzes & Homework | 200 | 20 |
| Position Papers (W) | 200 | 20 (W) |
| Term Paper Annotated Outline | 0 (10 bonus) | 0 |
| Term Paper Rough Draft | 100 | 10 |
| Term Paper Peer Review | 50 | 5 |
| Term Paper Final Draft (W) | 200 | 20 (W) |
| Total | 1000 | 100% |

Grading: Your final grade will be based on the percentage of possible points you earn from the lecture exams, lab exams, quizzes, other assignments, and participation according to the following scale:

| | | | |
|------------|------------|-------------|---------|
| A = 100-93 | A- = 90-92 | | |
| B+ = 89-87 | B = 86-83% | B- = 82-80% | |
| C+ = 79-77 | C = 76-73 | C- = 72-70 | |
| D+ = 69-67 | D = 66-63 | D- = 62-60 | F < 60% |

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- B *The grade of "B" indicates substantial mastery of the objectives of the course. "B" work must exceed all requirements of the assignment but does not demonstrate the excellence of "A" work.*
- C *The grade of "C" indicates average work. Any assignment that merely meets the requirements will receive a "C" grade. Grades above the "C" level require additional effort, creativity, thought, and application.*
- D *The grade of "D" indicates substandard work of sufficient quality and quantity to be counted toward graduation if balanced by above-average work in other courses.*
- F *The grade of "F" indicates failure to meet the objectives of the course.*

Course Policies

1. *Attendance:* attendance is a necessary part of this course. You are required to attend all class sessions and be prepared to discuss assigned reading from the texts. Attendance will be monitored on a regular basis.

- Absence from class will be excused only under the following circumstances: serious illness with a doctor's excuse, recognizable emergency, or participation in a college-sponsored activity.
- There are no make-up quizzes without a documented excuse.
- If you miss a lecture for any reason, it is your responsibility to obtain any handouts and the information for that week's work.
- Your final grade will be lowered by one letter if you miss **10%** of scheduled class meetings for unexcused absences.
- You will receive a course grade of "F" for missing **25%** of scheduled class meetings, excused or unexcused.
- Arrangements for missed assignments must be made no more than one week after the absence. Makeup of any work missed is purely at the discretion of the instructor.

2. *Late Assignments:* Due dates for homework and assignments will be announced in class. The grades of all assignments turned in after the due date will be reduced by 10% per class day late.

3. *Academic Honesty:* You will of course be asked to work in groups for certain assignments – that's how science works! Discussions with classmates both in and out of class will assist you in understanding the material more clearly. However, it is expected that all written work turned in will be your own and **completely your own**. Plagiarism and sharing of answers will not be allowed. Each student will be expected to adhere to the Longwood University Honor Code.

5. *Honor Code:* Longwood's Honor Code was created by its students and is administered by its students. Students are expected to observe the Longwood University Honor Code as specified in the Student Handbook. All exams, quizzes, and assignments handed in are considered to be pledged. Any student caught cheating on an exam or any assignment will receive a failing grade for the exam/assignment and perhaps the course at the instructor's discretion. **All** honor code violations will be reported and are subject to university disciplinary procedures. Note: ANY use of a cell phone or other communication device during an exam or quiz is considered an Honor Code violation. Removal of quizzes or exams from the lecture room is considered an Honor Code violation.

6. *ADA Statement:* All reasonable efforts will be made to accommodate students with disabilities. If you have special needs, please discuss these with me immediately so that arrangements can be made.

Tentative Lecture Schedule

| Date | Topic |
|-------------------|---|
| Week 1 Jan. 13 | <ul style="list-style-type: none"> • Course Introduction; Philosophy of Science <ol style="list-style-type: none"> 5. Watch “Judgment Day: Intelligent Design on Trial” 6. Assignment: Read Chapters 1-3 of <i>Your Inner Fish</i> 7. Assignment: Choose Topic for Term Paper |
| Week 2 Jan. 20 | <ul style="list-style-type: none"> • Discuss “Judgment Day” • Early Ideas of Evolution, the process of evolution <ol style="list-style-type: none"> 4. Assignment: Read Bergstrom and Dugatkin (B&D) Chs. 1 & 2 5. Assignment: Choose topics for EJC Presentations 6. Assignment: Evolution Journal Club #1 papers: Rabbits & Monkeyflowers |
| Week 3 Jan. 27 | <ul style="list-style-type: none"> • Evolution Journal Club #1 – Evolutionary Processes (Dr. Franssen) • Adaptation, Natural Selection and Constraint <ol style="list-style-type: none"> 4. Assignment: B&D Ch. 3 5. Annotated Outline 6. Position Paper #1 – What is a species? |
| Week 4 Feb. 3 | <ul style="list-style-type: none"> • Your Inner Fish Discussion #1 – Chapters 1-3 • Adaptation, Natural Selection and Constraint <ol style="list-style-type: none"> 1. Assignment: B&D Ch. 4 2. Assignment: Evolution Journal Club #2 papers: “Spandrels” & “Snakes” |
| Week 5 Feb. 10 | <ul style="list-style-type: none"> • Evolution Journal Club #2 – Evolutionary Processes • Phylogeny, Classification and Evolution <ol style="list-style-type: none"> 1. Assignment: B&D Ch. 5 2. Assignment: Read Chapters 4-6 of <i>Your Inner Fish</i> 3. Assignment: Homework #4 (Making Cladograms) |
| Week 6 Feb. 17 | <ul style="list-style-type: none"> • Your Inner Fish Discussion #2 – Chapters 4-6 • Phylogeny, Classification and Evolution <ol style="list-style-type: none"> 3. Assignment: B&D Chs. 6-8 |
| Week 6 Feb. 21 | <p>Richmond Metro Zoo Trip Saturday, February 21st Assignment: Create a Morphological Phylogenetic Tree</p> |
| Week 7 Feb. 24 | <ul style="list-style-type: none"> • Evolutionary Genetics • Hardy Weinberg According to Hoyle <ol style="list-style-type: none"> 3. Turn in Rough Draft! 4. Homework: Hardy-Weinberg |

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| | <p>5. <i>Assignment: B&D Ch. 11</i></p> <p>6. <i>Assignment: Create a Morphological Phylogenetic Tree (due after break)</i></p> |
| <p>Week 8 Mar. 3</p> | <p>No Class – SPRING BREAK</p> |
| <p>Week 9 Mar. 10</p> | <ul style="list-style-type: none"> • Zoo Trip Tree Discussion • Origin and Evolution of Early Life <p>1. <i>Assignment: B&D Ch. 12</i></p> <p>2. <i>Assignment: Evolution Journal Club #3 paper: “Self-replicating Systems”</i></p> |
| <p>Week 10 Mar. 17</p> | <ul style="list-style-type: none"> • Evolution Journal Club #3 – The Beginnings of Life • Major Transitions <p>1. <i>Assignment: B&D Ch. 13</i></p> <p>2. <i>Homework: Origins of Multicellularity</i></p> <p>3. <i>Assignment: Read Chapters 7-9 of Your Inner Fish</i></p> |
| <p>Week 11 Mar. 24</p> | <ul style="list-style-type: none"> • Your Inner Fish Discussion #3 – Chapters 7-9 • Major Transitions • Evolution and Development <p>1. <i>Assignment: B&D Ch. 18&20</i></p> <p>2. <i>Position Paper #2 – Extinction</i></p> <p>3. <i>Term Paper final draft due in two weeks</i></p> |
| <p>Week 12 Mar. 31</p> | <p>No Class – Credit for time spent on zoo trip outside of class</p> |
| <p>Week 13 April 7</p> | <ul style="list-style-type: none"> • Evolution of Sociality • Evolutionary Medicine <p>1. <i>Turn in Term Paper final draft</i></p> <p>2. <i>Assignment: Evolution Journal Club #4 paper: “Evolutionary Medicine”</i></p> <p>3. <i>Assignment: Watch “Becoming Human” Part 1 w/Homework sheet</i></p> |
| <p>Week 14 April 14</p> | <ul style="list-style-type: none"> • Evolution Journal Club #4 – Evolutionary Medicine • Human Evolution <p>1. <i>Assignment: Watch “Becoming Human” Parts 2&3 w/Homework sheet</i></p> <p>2. <i>Assignment: Read Chapters 10-Epilogue of Your Inner Fish</i></p> |
| <p>Week 15 April 21</p> | <ul style="list-style-type: none"> • Your Inner Fish Discussion #2 – Chapters 10-Epilogue • Human Evolution <p>1. <i>Homework: Course Evaluation</i></p> <p>2. <i>Position Paper #3 – Why Evolution?</i></p> |
| <p>Week 16 April 23</p> | <p>Final Tuesday, April 23rd 6-9:30pm</p> <p>Position Paper #3 Due</p> |

