General Information

Instructor: Barbara Berchiolli, email address: bberchio@depaul.edu; phone number: 312-362-8001, office hours: after class, 9:30 PM or by appointment

Course Dates: October 11, 2018-November 8, 2018; TH 5:45-9:00 PM
Loop Campus, School for New Learning, DePaul University, 14 E. Jackson Blvd., 14th Floor, Chicago, IL 60604 (on ground)

Credit Hours: 2

Course Description

A human is an elaborate and highly developed form of life. To appreciate the complexity of the human design we must pay attention to the tools that an intelligent mind used to make it: genetics and the shaping forces of the environment. The works of genetics gave rise to a form of life that was shaped by limiting environmental resources. An understanding of how humans receive their endowment of genes from previous generations will allow us to see how genes manufacture specific traits, which in turn are continuously tested and edited by the environment to ensure the continuation of the species. The theme that will be stressed throughout the course is the interdependence of the three biological subspecialties of genetics, the environment and evolution.

This course requires a substantial time commitment to the reading and understanding of a complex subject matter. More specifically, students must complete four group activities, a class presentation, and a topic proposal that details the contents of the presentation.

Learning Outcomes and Competencies

Students will be able to describe and explain connections among three diverse, but related aspects of nature: genetics, the environment and the change of species over time (evolution).

Students will be able to apply the steps of the scientific process to solve everyday problems.
Using the theory of evolution, students will be able to explain the change within a population of organisms that takes place over long periods of time.

BAIFA students can complete one of these competencies through the course:

S-4: Can describe and explain connections among diverse aspects of nature.

In this course we will address the S-4 competency by stressing the interdependence of three diverse, but related aspects of nature: genetics, the environment and the change of species over time (evolution).

S-1-A: Can explore natural phenomena or the world of everyday experiences using scientific methods, and can use theories to interpret observations.

In this course we will learn that the scientific process is a reliable method of investigation because it is based on experimental data, and because its results are testable and repeatable. We will address the S-1-A competency by identifying each step of the scientific process that is used to carry on a controlled experiment.

S-2-C: Can describe, categorize and explain development or change within physical or biological systems.

In this course we will address the S-2-C competency by examining the principles of the theory of evolution and its power to modify the traits of a population over long periods of time.

While the learning outcomes of the S-4, S-1A and S-2-C competencies will be addressed throughout the entire course, week one of the term will primarily address the learning outcomes of the S-1-A competence.

Learning Strategies & Resources

Required Texts

Each concept covered in this course will be approached in a fourfold manner that will include class discussions, teacher’s presentations, group activities and student independent research. The group activities are hands-on exercises that provide visual cues and often use simple tools (e.g., the tools to build a cell’s chromosomes and the stages of cell division) to present complex information through the more approachable “learning by doing” model. Ultimately, students will expand and consolidate their understanding of a topic through independent research.
Additional reading material may be handed out in class or made available, via a link on Desire2Learn or via e-reserve.

The guidelines needed to complete the required group activities will be discussed in class or posted on Desire2Learn.

**Learning Deliverables**

**Group Activities**

The learning outcomes and competencies for this course will be satisfied in a twofold manner, by completing four group activities and by preparing a class presentation of research. Each student will choose and research a particular topic, which is closely related to the material covered in this course and will present the research to the class. The presentation must be preceded by a one-paragraph topic proposal.

Students must complete four group activities, which represent **forty points** of the total 100 course points. Each activity includes a written component and some activities include a hands-on component. Constructing a model of a biological process (a model of cell division or the formation of sex cells) and predicting the inheritance of Mendelian traits are some examples of group activities. Group activities are completed in class and must be handed in no later than a week after the activity is completed. Group activities cannot be repeated. If a student misses a class section he or she will miss the points assigned to that particular activity. All group activities will be uploaded on Desire2Learn. Students should print a copy of each activity and bring it to class at the scheduled time.

**Topic Proposal**

Students must research a topic closely related to the course material and prepare a class presentation of their research to be delivered to the classroom. The class presentation topic must be approved by the instructor. Students must submit for approval a one typed paragraph topic **proposal**. The proposal must describe the topic of the class presentation and how it relates to the course material. **Students’ topics will be approved during week three.** Only a hard copy of the proposal will be accepted. In the event of a missed submission the student must inform the instructor of the reasons for the missed submission and must submit the proposal within one week of the missed deadline. The proposal must include a separate “Works Cited” page with a list of at least three sources a student will use for his or her class presentation. The sources must be cited in MLA style and at least one of them should not be a website. Specific guidelines to cite sources can be found by visiting [http://owl.english.purdue.edu/owl/resource/544/01/](http://owl.english.purdue.edu/owl/resource/544/01/). The topic proposal is **fifteen points** of the total 100 points course points.
Class Presentation

Students must prepare a ten-minute presentation of their research. A ten-minute question and answer session will follow the presentation. Presentations should serve a dual purpose: to enrich the presenter’s knowledge and to educate the audience. **Presentations will be delivered during week five.** Specific guidelines for completing the oral presentation will be discussed in class or posted on Desire2Learn. The class presentation is worth **forty points** of the total 100 course points.

Class Participation

Class participation is worth **five points** of the total 100 course points. Students must read the assigned materials prior to class and must be fully prepared to discuss concepts, ask questions and share their insights with classmates during both the lecture/discussions and group activities.

Assessment of Student Learning

The questions found in the Group Activities are objective and will be evaluated at face value. Typically, during a group activity, the instructor will visit all student groups to answer questions, demonstrate a procedure and guide student thinking process. Each activity is submitted within one week from the day the activity is completed. Graded activities are returned to students (summative assessment) approximately a week after their submission.

The instructor will provide a rubric that identifies all the components students must include in their class presentation, (e.g., providing supporting arguments and acknowledging sources) and how points are assigned to each component of the presentation. Students are encouraged to schedule a time, during the instructor’s office hours, to do a mock presentation (formative assessment) with the intent to receive feedback they can use during their real presentation (summative assessment). Also, the instructor will provide a rubric that will be used to evaluate the topic proposal.

Attendance is part of a student’s class participation grade. Missing one of the five course meetings will result in the loss of five points of the total 100 course points.
Grading Criteria and Scale

Grading Scale: Coursework Weight

- **A = 93-100%**
  - Group Activities = 40 points
- **A- = 90-92%**
  - Topic Proposal = 15 points
- **B+ = 87-89%**
  - Class Presentation = 40 points
- **B = 83-86%**
  - Class Participation = 5 points
- **B- = 80-82%**
  - **Total points = 100**
- **C+ = 77-79%**
- **C = 73-76%**
- **C- = 70-72%**
- **D+ = 67-69%**
- **D = 63-66%**
- **D- = 60-62%**
- **F = ≤ 59%**

Students have the option of taking the course on a Pass/Fail basis. Students who intend to do so must inform the instructor early in the course. Once students commit to taking a course Pass/Fail, they cannot switch back to a letter grade.

Fractional points/percentage will be rounded to the higher grade.

**Incomplete (IN) Grade:** An **incomplete grade** (IN) will be granted when evidence of an extenuating circumstance will be provided. To qualify for the IN, a student must have regularly attended class, and must have completed two thirds of assignments. The student must also initiate and file a **Contract for Issuance of Incomplete Grade** before the fourth week of the course to receive an incomplete grade.
The following class schedule is tentative and subject to change at the discretion of the instructor. Any changes to the syllabus will be discussed by the instructor in class.

**CLASS SCHEDULE**

<table>
<thead>
<tr>
<th>Week</th>
<th>Discussion Topic</th>
<th>Class Activity (each activity will exemplify and reinforce the concepts discussed in class)</th>
<th>Chapter in Textbook or Other Reading Material</th>
<th>Homework</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Introduction and Overview. The Scientific Process:</strong> What makes the scientific process a reliable method of investigation? What are the tools of the scientific process? <strong>Evolution by Natural Selection:</strong> How are genetics, the environment and evolution interrelated? How do they relate to the competencies? How does differential reproduction produce evolutionary changes?</td>
<td>Survival of the Fittest. Read the summary of a controlled experiment and identify all the components of the scientific process. Read the summary of an experiment pertinent to natural selection and identify the control group, controlled variables and the environmental pressures that triggered natural selection</td>
<td>1</td>
<td>Class Notes</td>
</tr>
</tbody>
</table>
| 2    | **Cells and Mitosis:** How can inherited characteristics be explained at the cellular level? What regulates cell division and death? | Construct a 3-D model of mitosis Mitosis video | 2       | Class Notes | Ch. 2
| 3 | **Meiosis**: How are sperm and egg cells formed? What generates genetic variability? | Construct a 3-D model of meiosis | 3 | Ch. 3 |
|   | **Concept Map of Meiosis** | Class Notes | Approval of student’s chosen topic for oral presentation |
| 4 | **Mendelian Inheritance**: How are single-gene traits transmitted from one generation to the next? Why does a trait seem to disappear in one generation and reappear in the next one? | Solve a series of genetics problems | 4 | Ch. 4 |
|   | Class Notes | Submission of outline of research. Only hard copies of the outline will be accepted. |
| 5 | **Student Presentations** | **Student Presentations** |
| 6 | Submit any late assignments |
Course Policies

Attendance

Regular attendance is mandatory. Since group activities are a considerable part of a student’s grade and can be completed only at the specific time they are scheduled, a student risks failing the course if he or she misses any classes. A student can obtain permission to miss a class only in the event of an extenuating circumstance, such as a major illness or hospitalization. If a class is missed the student is responsible for (1) obtaining all notes and assignments from a classmate, and (2) contact a classmate ahead of time to be the “tutor” for the missed session and (3) consulting Desire2Learn to obtain a list of the missed events and classroom activities. Students are expected to be on time and to remain for the duration of each class.

This course includes and adheres to the college and university policies described in the links below:

- Academic Integrity Policy (UGRAD)
- Incomplete (IN) and Research (R) Grades Expiration Policy
- Course Withdrawal Timelines and Grade/Fee Consequences
- Accommodations Based on the Impact of a Disability
- Protection of Human Research Participants

Other Resources for Students

- University Center for Writing-based Learning
- SNL Writing Guide
- Dean of Students Office
- Suggested readings/sources listed by instructor

Instructor’s Biographical Sketch:

I completed my undergraduate and graduate work in the field of biology with emphasis in botany, at the University of Rome, Italy where I received my degree of doctor in natural sciences (M.S. in natural sciences in the US). I also completed additional graduate studies and received a MA in education at the California State University of Northridge.