2015

132-02 Human Biology Lab

Nancy Matre
matre@xavier.edu

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Course Description: This course will promote depth of thought through the perspectives of guided (instructor guides students through the inquiry process) and open (students design their own experiments) inquiry to understand the process scientists use to gain new knowledge. This lab is a corequisite to Biology 102: Human Biology Lecture. In lecture, students will study five human body systems that work together to keep our body within normal limits in spite of the abuse we hand out on a daily basis with our eating, exercise, and sleeping habits. We will specifically look at how maintaining the body within normal limits, called homeostasis, as the basis for life.

Student Learning Outcomes (SLOs): Cohen et al., addressing science literacy, wrote in the American Biology Teacher in 2004 that science courses needed to be relevant to students’ lives. They point out that if the curriculum is made relevant then students would be more motivated to learn. Because of this learning, the following SLOs will result from a knowledge of body systems that will lead to a lifetime of healthy decisions:

a. Objective 1a: students will discuss, after designing and carrying out experiments, significant questions involving homeostasis as it relates to all five body systems that we study.
b. Objective 2a: students will find, evaluate, and logically convey information (results) and ideas (conclusions) in written and oral presentations by presenting their open inquiry results on homeostasis as it relates to the five body systems.
c. Objective 2b: students will evaluate their results from these experiments using quantitative methods and arguments (discussion/conclusions)
d. Objective 4b: students will discuss and evaluate (using experiments involving the five body systems) what constitutes human wellness.

Attendance is mandatory. The nature of this course depends on the active participation of all students. Announcements are made at the beginning of class. Missing the first few minutes of class will result in you not knowing what is going on that day. Roll will be taken at the start of each class. More than two absences will result the lowering of your final grade by a whole letter. Each additional two absences will lower your grade another whole letter. The only exception to this requirement will be for pre-approved absences due to University-related activities. No laptops, cell phones, or smart phones may be used during class unless you are told to look something up. Any exception to this policy must be pre-approved.

Homework is due at the beginning of class and will not be accepted later. Forgetting to bring the homework to class (saying you left it on your desk) will earn you a zero just as leaving a legal brief or business proposal on your home desk would probably leave you without a job. Homework assignments due on the day of an excused, prearranged absence must be turned in before the class meets to get credit. You must read the lab before you come to class because failure to read the lab will mean that you have no idea what you are doing that day. Keep in mind that although most of the assignments are worth just five to ten points, a five-point assignment is ~ 1% of your grade and a 10-point assignment is ~ 2% of
your grade. This is a one-credit hour class; therefore, you will be expected to spend a minimum of two to three hours per week studying outside of class.

**Tests** are given at the start of class. The same test is given in all three sections with graphs, photos, or other test question materials changed for each class. All instructors have been invited to submit questions and the test is a compilation of questions submitted. Because the tests are the same for each class, once the first section has taken a test, your instructor will not answer any questions that you have about the material, so students in all three sections should review the material before the test starts in case there are questions.

**Laptops, ipads, cell phones, smart phones, beepers, pagers, other handheld electronic devices, and all ipod-type devices:** so that your classmates are not distracted and lab interrupted, you must turn off all electronic devices during lab, including laptops. Lab is a time for the exchange of knowledge free from the distraction of other media. There may be times when you are allowed to get out a laptop in lab to search the internet for lab-related material, but you will be told when you can do this. No handheld devices (such as cell phones, smart phones, calculators, beepers, or pagers) or devices attached to your ear (such as ipods or bluetooth) may be used during the exams. Anyone found to have any of these devices out during an exam will be told to leave the exam and will receive a zero on the exam. You will need to put all electronic devices away (none are allowed on your person during the exam). If you do not have a backpack to place these in, you may leave them with your instructor during the exam. If calculators are needed on the test, the computers will have the calculators displayed for your use. You are not allowed to use a personal calculator or cell phone as a calculator during a test.


<table>
<thead>
<tr>
<th>Individual Grades</th>
<th>Pts</th>
<th>Team Grades</th>
<th>Pts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Popular Press Articles (Labs 3,7,12,13)</td>
<td>28</td>
<td>Graph/conclusion Salsa</td>
<td>15</td>
</tr>
<tr>
<td>Tests 1, 2, 3</td>
<td>225</td>
<td>Graph/conclusion another food test</td>
<td>25</td>
</tr>
<tr>
<td>Breakfast/lunch/dinner calculations</td>
<td>13</td>
<td>Graph/conclusion stress</td>
<td>25</td>
</tr>
<tr>
<td>Worst Food in Cincinnati</td>
<td>25</td>
<td>Graph/conclusion BP/Heart</td>
<td>25</td>
</tr>
<tr>
<td>Plastic</td>
<td>14</td>
<td>Graph/conclusion bacteria</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Graph/conclusion more bacteria</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>305</td>
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<td>140</td>
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**Academic Misconduct:** The Xavier University Handbook states that “…violations of certain standards of ethical behavior will not be tolerated at Xavier University. These include theft, cheating, plagiarism, unauthorized assistance in assignments and tests, unauthorized copying of computer software, the falsification of results and material submitted in reports…” . The first incidence of academic misconduct will result in a zero for the assignment. The second incidence will result in failure of the course. When the misconduct involves two or more students, all students involved will receive a zero the first time and an F for the course the second time. It does not matter if you copied the work or allowed it to be copied. Both are academic misconduct, and will receive the same treatment.
### Schedule of Labs:

<table>
<thead>
<tr>
<th>Lab/Dates</th>
<th>Activity</th>
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| **Lab 1** Aug 27 | Discussion: The process of science compared to pseudoscience  
Understanding guided and open inquiry  
Writing Science  
Peer Review  
Activity: Reading Science in the Popular Press  
Sugar in Pop  
Guided Inquiry: discuss eating hot foods and formulate hypotheses about how eating hot salsa affects homeostasis.  
Due at end:  
Homework: Read Lab 2, Read and sign Lab Safety Agreement |
| **Lab 2** Sept 3 | At the start of lab: Laboratory Safety Agreement due  
Discussion: Correlational, causal or mechanistic?  
Graphing  
Writing Conclusions  
The big picture: life is all about homeostasis  
Activity: Model of human body/ look at digestive system  
Guided Inquiry: Do salsa experiment/record results, graph team data/ discuss conclusions  
Due at end: Team Graph (10 pts) /conclusions (5 pts)  
Homework: Read Lab 3, article |
| **Lab 3** Sept 10 | At the start of lab: article (7 pts)  
Discussion: Worst Food in Cincinnati Project  
Obesity: Portion/Serving through the decades of government reaction to obesity  
BMI/BMR  
Activity:  
Calculate BMI/BMR  
Looking at government food portions and servings  
Calculate calories for breakfast, lunch, and dinner  
Open Inquiry: propose new homeostasis and food experiment  
Due at end: proposal for open inquiry, calculations for breakfast, lunch, and dinner as well as gain or loss (13 pts)  
Homework: Read Lab 4, Worst Food in Cincinnati |
| **Lab 4** Sept 17 | At the start of lab: Worst Food in Cincinnati due (25 pts)  
Discussion:  
Activity: Present and vote on worst food  
Review Food Labels  
Open Inquiry: Do food experiment/record results, graph team data/ discuss conclusions  
Due at end: Team graph (15 pts) and conclusions (10 pts)  
Homework: Read Lab 5/ Study for Test 1 |
| **Lab 5** Sept 24 | At the start of lab: **Lab Test 1 (75 pts)**  
Discussion:  
Activity  
Due at end:  
Homework: Read Lab 6 |
| Lab 6 | Oct 1 | At the start of lab:  
Discussion: How our five senses process information  
Brain on a case of beer  
Using a microscope  
Activity: Models of the brain/ neuron, eye, and ear.  
Guided Inquiry: testing general and special sensory receptors  
Microscopic examination of nerves  
Calculating BAC  
Due at end:  
Homework: Read Lab 7, article |
| --- | --- | --- |
| Oct 8 and 9 | Fall Holiday: No lab Thursday  
Lab 7 | Oct 15 | At the start of lab: article (7 pts)  
Discussion: Reflexes  
Balance  
Activity: Guided Inquiry: balance  
Guided Inquiry: reflexes  
Calculating BAC using different ABVs  
Open Inquiry: discuss stress and formulate hypotheses about how an exercise affects homeostasis  
Due at end:  
Homework: Read Lab 8 |
| Lab 8 | Oct 22 | At the start of lab:  
Discussion:  
Activity: Open Inquiry: Do stress experiment/record results, graph team data/ discuss conclusions  
Due at end: Team Graph (15 pts) /conclusions (10 pts)  
Homework: Read Lab 9/ study for Test 2 |
| Lab 9 | Oct 29 | At the start of lab: Lab Test 2 (75 pts)  
Discussion:  
Activity: Look at plastic demo  
Due at end:  
Homework: Read Lab 10, plastic information |
| Lab 10 | Nov 5 | At the start of lab: plastic information (14 pts)  
Discussion: Measuring blood pressure and heart rate  
Plastic  
Activity: Open Inquiry: discuss heart rate and blood pressure and formulate hypotheses about how they might change and how fast they return to normal (homeostasis) (? Revisit salsa experiment)  
examples of plastic in classroom  
Open Inquiry: Do BP and heart rate experiment  
Due at end:  
Homework: Read Lab 11 |
| Lab 11 | Nov 12 | At the start of lab:  
Discussion: Bacteria, culturing bacteria  
Common skin/throat bacteria  
Activity: Open Inquiry: Discuss BP and heart rate experiment/record results, graph team data/ discuss conclusions  
Guided Inquiry: culture bacteria from hands and cough  
Microscopic examination of bacteria |
<table>
<thead>
<tr>
<th>Date</th>
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</table>
| Nov 19     | **Open Inquiry**: propose something else to test/ formulate hypotheses/ design experiment  
**Due at end**: Team Graph (15 pts) /conclusions (10 pts)  
**Homework**: article                                                                 |
| **Lab 12** | **At the start of lab**: article (7 pts)  
**Discussion**: viruses  
H1N1 or H5N2  
**Tables**  
**Activity**: Results of skin bacteria experiment/graph or table/ discuss conclusions  
**Video**: Invasion of the Influenza B virus  
**Open Inquiry**: do new bacteria experiment  
**Due at end**: Team Graph or Table (15 pts) /conclusions (10 pts)  
**Homework**: Read Lab 13, article |
| **Nov 25-29** | **Thanksgiving Holiday No Lab Thursday**                                                                                               |
| **Lab 13** | **At the start of lab**: article (7 pts)  
**Discussion**: Drug inserts  
**Revisit and summarize the Big Idea: Homeostasis**  
**Activity**: Reading drug insert sheets  
**Results of skin bacteria experiment/graph or table/ discuss conclusions**  
**Due at End**: Team Graph or Table (15 pts) /conclusions (10 pts)  
**Homework**: Study for Test 3 |
| **Lab 14** | **Lab Test 3 (75 pts)**                                                                                                                  |

The above schedule is subject to change.