Principles of Modern Biology - Laboratory (BIOL1011.21) Syllabus

Fall 08

Lab Location/ Hours: DH 5523, Tues 8:10-9:50 or 1-2:50
Professor: Richard W. Lo Pinto, Ph.D., lopintor@fdu.edu, Tel: 201-692-2297
Office Hours: Monday 3-4:40; Tues 11:40 – 1 pm
Office Location: DH 4412

Basic Principles of Biology - from the nature of science to how science is applied to understanding the physical, chemical, and interactive aspects of living systems. For non-biology majors.

Student Learning Outcomes
1. Know the parts, function & proper use of the compound & dissecting microscopes.
2. Distinguish between prokaryotic & eukaryotic plant & animal cells.
4. Know all the cell parts & functions of eukaryotic plant & animal cells, their similarities and differences.
5. List, explain and identify the events that occur when plant & animal cells divide during mitosis and meiosis.
6. Write the summary equation for photosynthesis & identify the role of each reactant & identify the chloroplast pigments experimentally.
7. Describe the 3 major groups of organic compounds, which compose living organisms, and to describe some simple tests, which were performed to identify these compounds.
8. Explain Mendel’s principles of segregation & independent assortment and to be able to solve simple genetics problems involving dominance, recessiveness, co-dominance and sex linkage.
9. Identify the organ systems of the body; discuss their general functions and the major organs that compose them. Identify the 4 major types of tissues and describe the locations, characteristics and their distinguishing characteristics and functions.
10. Classify members of the Kingdom Plantae on the basis of external & microscopic structures.
11. Classify a group of diverse animals into their Phylum & Classes on the basis of their distinguishing characteristics.

Grading:
The final lab grade is an average of the two lab exams.
The letter grade scale is the same as for lecture.
Laboratory Requirements:
- Lab Coat, Foot Protecting Shoes (no sandals or open toed shoes), Dissecting Kit
- Safety Glasses Whenever Chemicals or Sharp Instruments are Used
- No Food or Drink May Be Brought Into Lab
- Read Lab Exercise Prior to Attending Each Lab Class - see sequence lab sequence
- Weekend Field Trip - Bring boots or get wet sandals, food & drink, appropriate clothes
- Scheduling of lecture/lab/ and field experiences may vary from that outlined as conditions dictate.

**Fall 08 LABORATORY SCHEDULE**

<table>
<thead>
<tr>
<th>Date</th>
<th>Lab Exercise</th>
<th>Description</th>
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<tbody>
<tr>
<td>1. Sept 2</td>
<td></td>
<td>Introduction- Requirements for lab (above): equipment and lab book</td>
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<tr>
<td>3. Sept 16</td>
<td>EX 5</td>
<td>Exchange between cells &amp; their environment: Test the reactions of cells when exposed to hypo-tonic, hypertonic, &amp; isotonic solutions. Explain osmosis, hemolysis, crenation, turgidity and plasmolysis on the basis of test results of experiments.</td>
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<td>4. Sept 23</td>
<td>EX 9</td>
<td>Compare slides of mitosis in Allium (plant) &amp; whitefish blastula (animal) mitosis. Study meiosis using chromosome simulation kits.</td>
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<td>5. Sept 30</td>
<td>EX 3</td>
<td>Chemicals of life. Test for the presence of inorganic &amp; organic compounds in foods. Benedicts test, test for starch, Sudan stain for lipids, and Biuret test for proteins</td>
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<td>6. Oct 7</td>
<td>EX 8</td>
<td>Photosynthesis: Extract chlorophyll from spinach- do paper chromatography to determine what pigments are present; &amp; spectrophotometry to determine absorption spectrum of chlorophyll. Explain the effects of light on photosynthesis utilizing a coleus plant.</td>
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<td>7. Oct 14</td>
<td>EX 10</td>
<td>Mendelian Genetics. Study dominant and recessive traits in humans and in corn. Examine widow’s peak, free ear lobes, bent and little fingers for hitchhiker’s thumb, etc. Solve genetic problems involving blood groups &amp; monohybrid cross in Indian Corn.</td>
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<td>8. Oct 21</td>
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<td>Lab Exam- Covers up to and including EX 8</td>
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<td>9. Oct 28</td>
<td>EX 27</td>
<td>Microscope study of prepared slides of epithelial, connective, adipose, muscle &amp; nervous tissue. Know the difference between cells &amp; tissues &amp; organs</td>
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<td>10. Nov 4</td>
<td>EX 19</td>
<td>Study monocot &amp; dicot flowers. Know all the parts &amp; functions. Study prepared slides of lily ovary &amp; flower buds. Examine several fruits, which develop from ovary. Identify parts of a non-germinating seed &amp; a germinating seedling. Know how to differentiate between monocot and dicot flowering plants.</td>
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<td>13. Nov 25</td>
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<td>Lab Exam</td>
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<td>14. Dec 2</td>
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<td>Field Compensation Day</td>
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<td>15. Finals</td>
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<td>FINAL EXAM Week December 10–16 - (Wednesday-Tuesday)</td>
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LABORATORY POLICIES AND PROCEDURES

PROPER LAB ATTIRE:
To increase laboratory safety SONS has instituted the following policy on lab attire. It will be strictly enforced so that anyone failing to comply with these policies will be asked to leave.

“No student will be permitted into laboratories wearing shorts, halter tops, open toed sandals, undershirts, tank tops or any other inappropriate attire”.

“All students are to purchase a full length laboratory coat which can be used for any Biology or Chemistry class which requires a lab-non-majors or majors”.

In addition all students must wear protective safety glasses at all times when in the laboratory except if otherwise specified. It is not necessary to wear these glasses during “lab lecture” as long as no laboratory activities are in progress and if sharp instruments are not being used. Safety glasses will be provided for your use. Please return them at the end of the lab session. If you observe any activity that may present danger please report it to the instructor immediately.

TARDINESS:
An aspect of lab work that is important for academics and for safety is the instruction given at the beginning of each class. It is essential therefore that all students be present exactly at the time class is scheduled to begin. Therefore anyone arriving late may be asked to leave and his/her absence for that day will be noted.

If for any serious reason you have to be late for class the instructor should be notified in advance. A message may be left at 201 692 2297.