Plant Physiology
Biology 414
Spring 2015

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Lecture: Butte 201, Tuesday and Thursday 12:30-1:45 Laboratory: Holt 225, Tu or Th 2:00-4:50

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/20</td>
<td>Course introduction</td>
<td>Syllabus and lab schedule</td>
</tr>
<tr>
<td>1/22-1/27</td>
<td>Plant and Cell Architecture</td>
<td>1-49</td>
</tr>
<tr>
<td></td>
<td>Organization of Plants and Cells</td>
<td></td>
</tr>
<tr>
<td>1/29</td>
<td>Genome and Gene Expression</td>
<td>51-79</td>
</tr>
<tr>
<td></td>
<td>• Nuclear Organization</td>
<td></td>
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<td></td>
<td>Gene Expression</td>
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<td><strong>Water and Plant Cells</strong></td>
<td></td>
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<tr>
<td>2/3</td>
<td>• Water and Water Potential</td>
<td>83-98</td>
</tr>
<tr>
<td></td>
<td><strong>Water Balance and the Plant</strong></td>
<td></td>
</tr>
<tr>
<td>2/5-2/10</td>
<td>• Water Absorption</td>
<td>100-118</td>
</tr>
</tbody>
</table>
- Transpiration

**Plant Mineral Nutrition**

2/17-2/19
- Essential Mineral Nutrients: Nutrient Deficiencies and Symptoms
- Treating Nutritional Deficiency
- Root-Microbe Interactions

**Solute Transport**

2/24-2/26
- Membrane Transport and Ion Uptake
- Membrane Transport Proteins
- Ion Transport in Roots
- Soil Properties and Nutrient Content

**Photosynthesis: The Light Reactions**

3/3-3/10
- Photosynthesis in Higher Plants
- Structure, Bioenergetics and Light-dependent Reactions
- Regulation and Genetics of Photosynthetic Systems

3/12

**Examination 1**

3/16-3/20

**Spring Break**

**Photosynthesis: Carbon Reactions**

3/24-3/26
Calvin Cycle: Photosynthetic Carbon Reduction
- Photorespiratory Carbon Oxidation
- CO₂ Concentrating Mechanisms and Synthesis of Sucrose and Starch

**Photosynthesis: Physiological and Ecological Considerations**

3/31-4/2
- Leaves and Photosynthesis
Leaves and Gas Exchange

Translocation in the Phloem

- Distribution and Translocation of Photoassimilates
- Sink-Source Interactions
- Phloem Loading and Unloading

Examination 2

Respiration and Lipid Metabolism

- Respiration: Energy Retrieval
- Lipid Metabolism

Nutrient assimilation

- Nitrogen and Sulfur Assimilation

Phytochrome and Light Control of Plants

- Photochemical and Biochemical Properties of Phytochrome
- Ecological Functions

Plant Growth Regulators

- Auxins
- Giberellins and Cytokinins
- Ethylene and Abscisic Acid
- Review for Final Exam

Examination 3

Grading Basis:
The course grade will be determined on the following basis: There will be a total of 500 points possible, which are distributed between the lecture and laboratory.

Late Assignments and make-up examinations: No assignments will be accepted past the due date. Arrangement for make-up examinations must be made in advance. There will be no exceptions!

Examinations: 300 points
• **Lecture examinations:** There will be two scheduled mid-term examinations and a final, each worth 100 points. The format of these exams will be short answer and essay.

**Laboratory 200 points**

• Laboratory grade: The laboratory will contribute 200 points toward the final course grade. Here is the point distribution:
  - Attendance and Participation - 30 points
  - Laboratory Notebook: This will be graded 3 times over the course of the semester - 60 points
  - Weekly homework questions, due at the beginning of the following lab - 30 points
  - Laboratory synopsis, typed, due at the beginning of the following lab - 30 points
  - Laboratory final exam - 50 points