Biology 453 Learning Outcomes

After completion of this course, successful students should be able to:

1. Describe the influence of various abiotic stresses on plant growth and distribution

2. Explain the molecular and physiological effects of different extreme environmental conditions on plants and describe key processes involved in plant acclimation to extreme environmental conditions

3. Compare and contrast the various nutrient pools in terms of the availability of nutrients in that pool to plants. For pools containing unavailable nutrients, explain what processes must happen to make nutrients available to plants.

4. Explain how plant symbioses with microorganisms (mycorrhizal fungi, nitrogen-fixing and other bacteria) influences the availability of nutrients in different pools to plants

5. Analyze the costs and benefits of symbiosis with microorganisms to both partners

6. Give examples of plant interactions with animals as prey, herbivores and pollinators; explain how these interactions influence plant growth and distribution

7. Categorize plant defense mechanisms into structural, constitutive biochemical, and induced biochemical responses, evaluating the cost and benefits of each mechanism

8. Provide and explain examples of how flowers and pollinators have evolved physiological compatibilities

9. Identify strategies by which plants attract pollinators as well as strategies that allow plants to minimize pollen herbivory and maximize pollen transfer

10. Write a concise and accurate summary or critique of articles from the primary literature