**Bio 2 Exam 2 Study Guide**

Fill in the blank answers will come from the key words or terms from each lecture. Words not used in fill in questions will likely be used in true or false, or multiple choice questions. **Short answer and short essay questions will come from emboldened topics.** **Long essay questions will come from the emboldened and underlined topics**

**Chapter 29 – Plant Diversity 1**

**Know the following**: Characteristics of plants. Know the characteristics that plants share with green algae and the derived traits of land plants. Difference between gametophyte and sporophyte. Alteration of generation process. Male and female gametangia and what they produce. Adaptations for terrestrial life. Types of vascular tissue. Characteristics of the different non-vascular and vascular seedless plant phyla, including presence or absences of true leaves, stems and roots, vascular tissue, type of sporangia, types of leaves, presence of flagellated sperm, and modes of reproduction. **Life cycle of Bryophyta**. Types of sporangia. **Pterophyte life cycle**.

**Key words or terms**: sporopollenin, sporangia, gametophyte, sporophyte, archegonia, antheridia, thallus, seta, homosporous, heterosporous, microphylls, megaphylls, sporophylls, strobili, sori, prothallus

**Chapter 30 – Plant Diversity II**

**Know the following**: Adaptations for success in terrestrial landscape. Shift in alteration of generations from non-vascular seedless plant to vascular seedless plants to vascular seed plants. Benefits form a reduction in the gametophyte generation. Differences between monecious and dioecious plants. Characteristics of the four gymnosperm phyla. **Life cycle of Coniferophyta**. Characteristics of Anthophyta. Parts of the flower. Difference between complete and incomplete flowers. Different types of fruit development (simple, aggregate, and multiple). **Life cycle of Angiosperms**. **Differences between monocots and dicots (Table)**. Characteristics of the nine angiosperm plant families described in lecture. Causes of deforestation.

**Key words or terms**: sporopollenin, monecious, dioecious, sepal, petals, carpel, stamen, spikelet, hypanthium, legume, areoles, glochids, silique

**Chapter 35 – Plant Structure and Growth**

**Know the following:** Function of the different tissue systems. Description and function of the different ground tissue cell types. Description and function of different dermal tissue components. Cells and tissues in that make up the vascular tissue system and their function, including xylem (tracheids, vessel elements) and phloem (sieve-tube elements and companion cells). What vascular tissue is lacking in most gymnosperms which results in softer wood? (vessel elements). Know the function of the vascular cell types and if they are alive or dead at maturity. Different types of meristematic tissue and what they produce, including apical meristem (protoderm, ground meristem, and procambium) and lateral meristem (vascular cambium and cork cambium). **The different tissues within a monocot and dicot root and the function of each tissue type**. Know where lateral roots develop from. Different root types. Differences between monocot and dicot roots and stems. Which ones have a pith? Different types of modified stems. **Be able to describe the process of secondary growth in stems**. Different layers of a leaf and the function or each layer. Different types of modified leaves.

**Key words and terms:** parenchyma cells, collenchyma cells, sclerenchyma cells, sclerids, lignin, cuticle, trichomes, periderm, stele, xylem, phloem, tracheids, vessel elements, sieve-tube elements, companion cells, apical meristem, protoderm, ground meristem, procambium, lateral meristem, vascular cambium, cork cambium, pith, pericycle, endodermis, casparian strip, passage cells, cortex, buttress roots, pneumatophores, haustorial roots, axillary bud, stolons, rhizomes, tubers, cladophylls, guard cells, mesophyll, palisade layer, spongy layer, stomata, tendrils

**Chapter 36 – Resource Acquisition and Transport in Plants**

**Know the following:** The equation for water potential and how the solute and pressure potentials change within a cell depending on the environmental conditions. Be able to predict the direction of water movement given the solute and pressure potentials inside of a cell and in the environment surrounding the cell. Know the difference between turgid, flaccid and plasmolyzed. **The difference between the apoplastic and symplastic routes. Know the areas where the solutes are screened along each route.** **Know the function of the casparian strip and what it is made up of**. What is bulk flow and how does it differ from diffusion? **Be able to describe the movement of a water molecule as it moves into the roots through the different routes, up woody dicot tree and into the leaves, then describe how water is pulled up the tree by the transpiration in the leaves.** The role of K+ and H+ ions in opening and closing of the stomata. Things that stimulate stomatal opening and closing. Adaptations for reduced transpiration. Areas that typically act as sugar sources and sinks.

**Key words and terms:** tonicity, hypertonic, isotonic, hypotonic, turgid, flaccid, plasmolyzed, apoplastic, symplastic, casparian strip, suberin, transpiration, cohesion-tension hypothesis, guttation, bulk flow, translocation, sugar source, sugar sink, circadian rhythm

**Chapter 39 – Response to Signals in Plants**

**Know the following:** The five major hormones in plants (auxin, cytokinins, gibberellins, abscisic acid, and ethylene), including the location where they are produced and the major functions. **The role of auxin and cytokinins in regulating apical dominance**. The polar transport of auxin (why is it one directional). **Cell elongation in response to auxin or the acid growth hypothesis**. Know how light can work as an on and off switch when exposed to short-day and long-day flowering plants. Plant response to environmental stress (drought, oxygen deprivation, salt, heat, cold) and herbivory (signal predators, produce chemicals, alter flowering). **Be able to describe the differences between the two types of plant responses to pathogens (hypersensitive, and systemic-acquired).**

**Key words and terms:** tropism, phototropism, gravitropism, statoliths, thigmotropism, senescence, photoperiodism, phytochrom red, phytochrome far-red, Pathogen-associated molecular patterns (PAMPs), hypersensitive response, systemic acquired response,

**Chapter 37 – Soil and Plant Nutrition**

**Know the following:** What is the most fertile soil**?**  **Be able to describe how soils attract positively charged molecules (cation exchange) then transport those molecules through the two routes through the roots.** Purpose of nitrogen fixation. Ways that plants absorb or obtain nitrogen. Different types of mycorrhizae.

**Key words and terms:** topsoil, loams, nodules, ectomycorrhizae, arbuscular mycorrhizae, arbuscules, epiphytes, haustoria