

Use your other three study guides to prepare for the cumulative part of the Final Exam. The following is to help guide you through your notes to prepare for the cumulative portion of the exam.

The Bryophytes

Know the general anatomy of the main groups of bryophytes.

Know how bryophytes are different from the tracheophytes.

Know the meaning/significance of: gametophyte, sporophyte, gamete, spore, sporophyll, microsporophyll, megasporophyll, microspore, megaspore, archegonium, antheridium

Know the characters that set each group of bryophytes apart from the more primitive groups.

Know the meaning/significance of isogamy, heterogamy, oogamy, rhizoid, thallus

What is the Doctrine of Signatures? Read the link to the web page on the Doctrine, and be ready for a question or two.

The Seedless Tracheophytes

Know the synapomorphies that set tracheophytes apart from bryophytes, and which ones continued the inexorable trek towards a terrestrial existence.

Know how seedless tracheophytes (STs) are still tied to water and why.

Know the organs and which is the most primitive and most derived.

Recall the four types of tissue (meristematic, ground, vascular, dermal), their derivatives, and components. How are they specialized in each group of seedless tracheophytes?

Know the meaning/significance of tracheids, vessel elements, tracheary elements, stele (and the parts thereof), protostele (e.g., haplostele, actinostele, plectostele, and where you'd be likely to find them), siphonostele (e.g., solenostele, dictyostele, eustele), enation, microphyll, megaphyll

Know the generalized life cycle of the seedless tracheophytes (ferns as an example), the ploidy of each stage, etc.

Know the general characteristics of the three extinct STs we discussed in lecture, and how they reflect characters now seen in extant taxa.

Know the general characteristics of Club Mosses, and the main differences between *Lycopodium* and *Selaginella*.

Know the meaning/significance of strobilus, eusporangium, leptosporangium, rhizome, rachis, fiddlehead, sorus, indusium, annulus

Know the general anatomy of a fern gametophyte and where the antheridia and archegonia are located, as well as where the sporophyte grows.

Know the general characteristics of the Psilotales (whisk ferns), Equisetales (horsetails), and the interesting dispersal mechanism exhibited by the spores of the latter.

The Gymnosperms

Know the five phyla of seed plants, and which are gymnosperms. Know the general characteristics of each of the gymnosperm taxa, as well as their names.

Know how gymnosperms are different from angiosperms.

Know the general anatomy of an ovule and of a seed, and which tissues are derived from which generation (sporophyte, gametophyte, new sporophyte)

Know the meaning/significance of nucellus, integuments, micropyle, seed coat, ovule,

Know the ecological significance of the "Coal Age" plants, and how human activity might be changing the climate to more like what it was in the Carboniferous.

Know the general life cycle of the Pine, and the ploidy of all the stages.

Know the meaning/significance of pollen, pollination, fertilization, pollen tube, ovulate, staminate, monoecious, dioecious (and which plant groups tend to be which), haustorial,

What is taiga? Why are conifers dominant there, and not flowering plants?

Know the general anatomy of the leaf arrangement in a pine, as well as the terminology associated with pine needles and their clusters.

Know the meaning/significance of softwood, hardwood, springwood, summerwood, heartwood, sapwood.

Be able to recognize common examples of conifers.

Know the general characteristics of the cycads.

What is distinctive about the female seed of the Ginkgo?

What are the general characteristics of the Gnetophytes, and what links them as the probable sister taxon to Anthophyta?

What's interesting about our only North American Gnetophyte, *Ephedra*? What about *Gnetum* and *Welwitschia*?

The Anthophytes: Introduction

Know the synapomorphies that set Anthophytes apart from the other Spermatopsida.

Know the parts of a flower, and from what each is derived. Know all the flower's anatomical terms and be able to apply them.

Be able to recognize the different types of placentation.

Know the meaning/significance of: perfect vs. imperfect flowers, complete vs. incomplete flowers.

Recognize the most common types of inflorescences, as we discussed in lecture. Know the difference between a determinate and indeterminate inflorescence.

Know the parts of the special inflorescence called a capitulum, and what family has it.

Know the anatomical terms and structures associated with a capitulum.

Know the meaning/significance of: hypogynous, perigynous, and epigynous flowers, superior and inferior ovary (and which type of flower is associated with which ovary position), double fertilization, endosperm

Know the generalized anthophyte life cycle (as exemplified by the lily). Know the anatomy of the female gametophyte, and the names and fates of her eight nuclei.

The Anthophytes: Evolution

Know the earliest anthophytes from the fossil record (e.g., *Archaeofructus*), their general anatomical characteristics, and how they foreshadowed Things to Come in the Anthophyta.

Know the major taxonomic groups within the Anthophytes: Amborellaceae, Magnoliidae, Nymphaeaceae, monocots, eudicots, and what distinguishes them from each other.

Know the characters that helped make anthophytes the most successful organisms on the planet.

Know the general features of pollination, and the features of flowers that are evolved to attract particular types of pollinators (as per lecture notes).

Know the general evolutionary trends seen in flowers, and the significance of those trends.

Know the general characteristics of the two most speciose flower families, Asteraceae and Orchidaceae.

The Anthophytes: Anatomy and Function

Know the meaning/significance of: perfect vs. imperfect flowers, complete vs. incomplete flowers.

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Know the parts of the special inflorescence called a capitulum, and what family has it.

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Angiosperms: Anatomy and Significance of Fruits

Know the general anatomy and parts of a fruit, the ploidy of its layers and components, and what generation each represents.

Know the names and main characteristics of the various types of botanical fruits (berry, pome, drupe, different types of berries, dry dehiscent and indehiscent fruits, etc.).

Know the meaning/significance of: simple, aggregate, multiple, and accessory fruits;

Be able to recognize a fruit that developed from an inferior ovary, as opposed to a superior ovary. Which configuration is more primitive?

Plant Ecology

Understand the significance of coevolution between plants and animals and the evolutionary advantages of secondary metabolites.

What is ethnobotany, and how might it be beneficial to modern society?

Know the meaning and significance of ecological succession, pioneer species, climax communities, tree fall gaps, the causes of initiating succession, etc.

Know the general characteristics, locations and typical flora and fauna of the major terrestrial biomes.