BIOL 221 – Concepts of Botany; Dr. Hardy
Exam 1 Guide

Topic 01 – Introduction to Botany
Reading: Evert & Eichhorn (2013) Chapter 1 & 3 (pp 38-62)

I. Plants are more important to you than you know
   A. The naked truth (about plant fibers)
      1. Cotton is king
         Cotton facts and extraction process
      2. Flax was king
         Flax fiber facts and extraction process
      3. Pineapple fiber
         Pineapple fiber facts and extraction process
   B. Biomass in the ecosystem
   C. Your mass
   D. Your caloric intake
   E. Wood fueled human development
   F. Human intellectual development driven by paper
   G. Plants as shelter
   H. Plants set the landscape, atmosphere
   I. Medicines and recreational drugs
   J. Forensics
   K. The future...

II. Cycad stories
   A. Vegetative morphology
   B. Reproductive morphology
   C. Economic botany
   D. Biogeography and conservation
   E. Cycads and Guam dementia

Topic 02 – Primary Body
Reading: Evert & Eichhorn (2013) Chapter 22, 24, 25

I. Introduction
   A. Primary vs. secondary body
      1. Primary body and primary growth
      2. Secondary body and secondary growth
   B. Polarity and Apical Meristems Established in Embryo
      1. The embryo & seed of angiosperms
      2. Embryogenesis
   C. Dormancy & Germination
   D. Seed & Seedling Examples
      1. Legumes (dicot angiosperms)
      2. Grasses (monocot angiosperms)

II. Vegetative Morphology
A. Shoot System  
1. Organ types, form & function  
2. Architecture  
B. Root System  
1. Organ type, form & function  
2. Architecture  

III. Vegetative Anatomy  
A. Plant Cells are Different  
B. Tissues & Tissue Systems  
C. Root Anatomy  
1. In Transverse Section  
2. In Longitudinal Section  
3. Lateral Roots  
D. Stem Anatomy  
1. In Transverse Section  
2. In Longitudinal Section  
E. Leaf Anatomy  
1. In Transverse Section  

**Topic 03 – Secondary Body**  
Reading: Evert & Eichhorn (2013) Chapter 26 and the  
Info Box on Bamboo on p. 603 of Chapter 25  

I. Vascular cambium  
A. Formation  
B. Bifacial  
C. Annual rings  
D. Rays  
E. Fusiform and ray initials  
F. Vascular cambium in roots  

II. Cork cambium  
A. Formation  
B. Properties of cork  
C. Lenticels  
D. Multiple cork cambia and layered periderms  

III. Morphology of woody trunk  

IV. Morphology of woody twig
Topic 4 – Plant Modifications

I. Modifications of Shoot Organs
   A. Leaves
   B. Stems
II. Modifications of Roots

Topic 05 – Arborescent Monocots

I. Introduction
   A. Monocot evolution
   B. Yet some are arborescent
II. Arborescent Monocot Examples
   A. Palm Trees
      1. Primary thickening meristem
      2. Diffuse growth in length below
      3. Secondary thickening meristem in some
   B. Banana “Trees”
      1. Primary thickening meristem
      2. Leaf growth to form pseudostem