

**STUDY GUIDE FOR FINAL EXAM**  
**BIOL 1104**  
**WINTER 2012**

The final exam will consist of 80 multiple choice questions : 20 questions on the evolution module, 20 questions on the ecology module and 40 questions on the diversity module.

The final exam is worth 30% of the final mark.

The questions will be similar to those in the previous midterms and quizzes. This guide outlines the general topics you need to know and understand for the final but all the material covered in the lectures is subjected to evaluation (unless specified otherwise in this guide).

## **PART 1 : EVOLUTION**

### **Scientific method and research**

- Characteristics of science
- Different approaches to scientific research and their pros and cons

### **Evidences for evolution**

- Fossils
- Homologies

### **Natural selection**

- Foundations of the theory
- Types of selection

### **Microevolution**

- Agents of microevolutionary changes
- Hardy Weinberg
- Calculation of allele and genotype frequencies based on Hardy-Weinberg

### **Sexual selection**

- Foundation of the theory
- Types of sexual selection
- Differences between sexual and natural selection

**\*\*There will be no questions on the history of evolutionary thoughts.\*\***

## **PART 2 : ECOLOGY**

### **Population ecology**

- Models of population growth (no need to memorize the equations)
- Life-history traits
- Life tables and survivorship curves (be able to calculate the life table variables)
- Population regulation : density dependent and independent processes
- Estimation of population size (Lincoln Petersen Index - no need to memorize the equation but you need to be able to use it)

### **Community Ecology**

- Types of interspecific interactions (symbiosis, parasitism, commensalism, mutualism, predation, interspecific competition)
- Mechanisms of predator avoidance
- Exploitative versus interference competition
- Evidence of interspecific competition (resource partitioning and character displacement)
- Measures of community structures (richness, evenness, diversity-no need to memorize the formulas)
- Factors influencing community structures (bottom up, top down, disturbance)
- Types of succession

### **Ecosystem ecology**

- Net primary productivity (factors influencing NPP, differences in NPP among ecosystems, global patterns in NPP)
- Energy transfer and ecological efficiency
- N cycles : organisms involved and their roles. Disruption of the N cycle.
- C cycle and impact on climate

## **PART 3 : DIVERSITY**

### **Evolutionary tree**

- Be able to read evolutionary tree (see quiz on tree on WebCT and paper on how to read trees)
- Know the vocabulary (e.g. analogy, homology, parallel evolution, synapomorphies, clade, sister taxa, apomorphic, plesiomorphic)

### **Taxon specific lectures (Prokaryote, Protists, Fungi, Plants, Animals)**

The material not covered in the lectures will not be covered in the final but I do recommend using the textbook to study because the lectures were largely based on the textbook.

**For all groups (prokaryotes, protists, fungi, plants, animals)**

- Make sure you know the taxa in red
- Be able to recognize representative organisms of each major taxa based on an image or a list of characteristics.
- Know the disease causing organisms discussed in class

**Fungi**

- Life styles of fungi
- The types of association between fungi and other organisms

**Plants**

- Life cycle of the groups covered in class
- Evolutionary trend in plants life cycle
- Key differences among the different group of plants
- Adaptations of plants to life on land
- Innovations of gymnosperms and angiosperms

**Animals**

- The different types of body cavity
- Patterns of symmetry
- Characteristics of the chordates including which taxa belong to the chordates
- Characteristics of amniotes including which taxa belong to the amniotes
- Types of skull fenestration (i.e. anapsid, diapsid, synapsid) and which taxa belong to each group
- Adaptations to flight in birds

**You don't have to know**

- Group specific anatomical details (i.e. internal structures)
- Number of species in each taxon but have a general idea of the relative diversity of each group
- Age of each taxa

**Best luck to you all !**