BIOLOGY 105 - FALL 1995
FUNDAMENTALS OF BIOLOGY
SEMESTER I


Instructor - Dr. Kent Schwaegerle

Office - 307A Bunnell; 215 Irving
Mailbox - 305 Bunnell; 211 Irving

Office Hours - 1. Th 10:00-noon 305 Bunnell
2. By appointment any time

Phone - 474-5920; 474-5622; 479-5134 (home)

Teaching Assistants (TAs) and Office Phone Numbers:

Ann Johnson    7144
Jim Lawler      7006
Olav Ormseth    7085
Mike Oehler     7006
Brian Person    7006
Scott Smidt    7774
Kim Sommer     7078
Jennifer Woods  6677

GRADING

1. Points will be awarded for performance on lecture and laboratory exercises.

2. Grades will be based on percentage of total possible points according to the scale:

   A    90 - 100%
   B    80 - 90
   C    70 - 80
   D    60 - 70
   F    0 - 60

3. Lecture and laboratory exercises

   350 pts Four midterm exams (one hour each) will cover assigned readings, lecture, and laboratory material. Point value of each exam is indicated on the course schedule.
   200 pts Final exam, two hours.
   30 pts Draft of lab report #1
   50 pts Lab report #1
   100 pts Lab report #2
   50 pts Lab test #1
   50 pts Lab test #2
   50 pts Final lab test
   120 pts Eight lab quizzes, 15 points each

4. If you are going to miss an exam, it is essential that you contact Dr. Schwaegerle as soon as possible to discuss your excuse. Unexcused absences from exams will be recorded as a zero.

5. If you are going to miss lab, you must contact your teaching assistant as soon as possible to make arrangements for making up the exercises you will miss. If you miss a lab and don't make arrangements, you are individually responsible for mastering material and completing assignments made during that lab. Unexcused absence from lab tests and quizzes will be recorded as zeroes.

6. Academic dishonesty - The UAF Honor Code is presented on page 19 of the 95-96 Undergraduate Catalog. No collaboration among students will be allowed on exams and quizzes, and although we will work together in collecting,
analyzing, and interpreting data, no collaboration is permitted in writing of lab reports and lab assignments. Copying or paraphrasing another student's writing is a violation of the Honor Code. Evidence of academic dishonesty will be presented to the University Disciplinary and Honor Code Committee and may result in an F for the course and/or expulsion from the University.

COURSE SCHEDULE

F Sep 8 Biology: the science of life pp 2-19

SECTION ONE
Ecology

This section of the course explores the diverse ways that living organisms interact with their environment. These interactions are important because they determine the distribution and abundance of biological species on the surface of the earth. An understanding of these interactions is essential for making wise decisions about managing our environment and will provide a framework for studying life processes throughout Biology 105-106.

M Sep 11 Global patterns of life pp 1052-1082
W Sep 13 " pp 1083-1105
F Sep 15 Population Ecology LAB 1 - Observation and Hypothesis Building; Q1

M Sep 18 " pp 1106-1131
W Sep 20 Community Ecology pp 1132-1157
F Sep 22 " LAB 2 - Testing Hypotheses and Reporting Results; Q2

M Sep 25 Ecosystem Ecology pp 1048-1051
W Sep 27 " LAB 3 - Computer simulations of population growth; Q3
F Sep 29 The Role of Science in Building Public Policy

SECTION TWO
Genetics

The next two sections of the course will focus on the properties of organisms that explain evolution. You will see that biological species are made up of individuals that are genetically unique. Mendel's rules of inheritance explain how these genetic differences are passed from generation to generation. You will see that evolution is a necessary consequence of genetic variation in populations. You will also see that the prevailing scientific views on evolution have changed radically during the last 200 hundred years and that these views continue to change as we learn more about the genetics and ecology of living organisms.

M Oct 2 Variation in plant and animal populations pp 244-257
W Oct 4 Patterns of inheritance
F Oct 6 Meiosis and the sexual life cycle

LAB 4 - Competition and predation; LAB TEST #1
M Oct 9  EXAM 1 (11:30-12:30 Bunnell Auditorium) covers lecture and laboratory material from September 8 through September 29.  100 points

W Oct 11  Mendel and the scientific process  pp 258-267
F Oct 13  Mendelian inheritance  pp 267-279

LAB 5 - Mitosis and meiosis; Q4

M Oct 16  Chromosomes and gene linkage  pp 280-299

SECTION THREE
Evolution

W Oct 18  Darwin and the scientific process  pp 420-437
F Oct 20  Population genetics  pp 438-442

LAB 6 - Human genetics problem solving; Lab report draft due

M Oct 23  EXAM 2 (11:30-12:30 Bunnell Auditorium) covers lecture and laboratory material from October 2 through October 16.  75 points.

W Oct 25  Microevolution  pp 442-455
F Oct 27  Species and speciation  pp 456-473

LAB 7 - Bacteria experiments; Q5

M Oct 30  Classification and the origin of life  pp 474-532

SECTION FOUR
The Diversity of Life

This section of the course will help you become familiar with the diverse forms of life that have existed on the earth. When you are walking in the forest or on the beach the question often comes up, "What is THAT??!" as IT squirms away into the darkness. After completing this section of the course we hope you will often be able to answer that question, and if you don't know what IT is you will be able to use your knowledge of evolutionary relationships to speculate about what IT is.

W Nov 1  Monera, Protista, Viruses, Fungi  pp 533-558; 583-597
F Nov 3  Rise of the invertebrates  pp 598-611

LAB 8 - Monera, Protista, Fungi; Lab report #1 due

M Nov 6  EXAM 3 (11:30-12:30 Bunnell Auditorium) covers lecture and laboratory material from October 18 through October 30.  75 points

W Nov 8  More invertebrates  pp 611-634
F Nov 10  Earliest plants  pp 559-582

LAB 9 - Animal diversity; Q6

M Nov 13  First land animals and early vertebrates  pp 635-640
W Nov 15  Fishes; birds; amphibians  pp 640-648
F Nov 17  Reptiles; mammals; angiosperms  pp 648-669

LAB 10 - Plant diversity
LAB TEST #2
SECTION FIVE
Plant Biology

We will examine the external and internal structures of plants and learn how these structures allow the plant to acquire materials from its environment that can be used for the construction of more structures. We will see that hormones coordinate the acquisition and deployment of growth resources. Ultimately, resources from the environment are used for construction and deployment of reproductive propagules. The structure of plant communities is determined primarily by these simple relationships between plants and their physical environment.

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<th>Date</th>
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<tbody>
<tr>
<td>M Nov 20</td>
<td>Plant structure and growth</td>
<td>pp 674-698</td>
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<td>W Nov 22</td>
<td>Plant growth resources - photosynthesis</td>
<td>pp 199-220</td>
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<td>F Nov 24</td>
<td>Thanksgiving - NO CLASS</td>
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LAB - Lab report #2 due; NO LAB THIS WEEK!

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<tr>
<td>M Nov 27</td>
<td>EXAM 4 (11:30-12:30 Bunnell Auditorium) covers lecture and laboratory material from November 1 through November 17. 100 pts</td>
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<tr>
<td>W Nov 29</td>
<td>Plant growth resources - water</td>
<td>pp 699-717</td>
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<td>F Dec 1</td>
<td>Plant growth resources - nutrients</td>
<td>pp 718-733; pp 756-777</td>
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LAB 11 - Plant Structure and Function; Q7

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<tr>
<td>M Dec 4</td>
<td>Plant reproduction</td>
<td>pp 734-755</td>
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<td>W Dec 6</td>
<td>Plant reproductive ecology</td>
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<td>F Dec 8</td>
<td>Organization of plant communities</td>
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LAB 12 - Plant reproduction; Q8

SECTION SIX
Perspectives on biology as a science

In this section of the course we will examine the process of science. What types of questions can be answered by the scientific method? What types of questions cannot be addressed by science? How is biology similar to other fields of science? How is it different? What effects does science have on society? How does society influence the course of science?

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<td>M Dec 11</td>
<td>Science as a way of knowing</td>
<td>Reserve</td>
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<td>W Dec 13</td>
<td>The place of biology among the sciences</td>
<td>Reading</td>
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<td>F Dec 15</td>
<td>Science and society</td>
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LAB 13 - Final lab test

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<tr>
<td>M Dec 18</td>
<td>FINAL EXAM (10:15-12:15 Bunnell Auditorium) covers lecture and laboratory material from Nov 20 through Dec 15 (125 pts) and reviews material from previous sections of the course (75 pts).</td>
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