Biology 105X
Fundamentals of Biology - Semester I
Fall 2002

Instructor - Dr. Kent Schwaegerle - fkkcs@aurora.alaska.edu
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Mailbox - 302 Bunnell; 211 Irving
Office Hours - Th 10:00 to noon in Bunnell and by appointment anytime
Phone - 474-5920 (305C Bunnell); 474-5622 (215 Irving); 479-5134 (home)

        Benjamin/Cummings, New York.
or
        Benjamin/Cummings, New York.

Course Materials - provides an outline of lectures and additional course materials that are also available online at the Biology 105 web site.

Teaching Assistants: Amber Beal 6052 Luke Bruner 7008
                    Stacie Hall 1978 Baek Jun Kim 7006
                    Jennifer MacDonald 6051 Jack McFarland 7183
                    Matthew Smith 7906 Tumi Traustason 1978

Biology 105 Facilities: Laboratories - Bunnell 302 and 308
                    Computer Labs - Bunnell 301 (access through 305); Bunnell 407
                    TA Conference Room - Bunnell 307E; Phone = 1978
                    Study Room - Bunnell 301A (access through 305)
                    Web Site - http://mercury.bio.uaf.edu/courses/biol105

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
   400 pts Four one-hour exams will cover assigned readings, lecture, and laboratory material.
   200 pts Final exam, two hours.
   200 pts Two lab reports - 100 pts each.
   200 pts Five Team Presentations.
   25 pts Team Web Page.
   75 pts Three short reports - 25 points each.
   165 pts 11 take-home, open-book quizzes - 15 pts each.
   <75 pts Five lab exercises; 5-15 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 a lab exercise will be recorded as a zero.

http://mercury.bio.uaf.edu/courses/biol105/syl02.html

9/10/2002
Course Schedule

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.

F Sep 6  L1 - Introduction - Science and methods for learning about nature p16-22(13-18)

M Sep 9   L2-What is ecology? p1092-1095(1026-28)

W Sep 11 L3-Global patterns of life p1100-1106(1028-34); 1112-1118(1042-47)

F Sep 13 L4-Population ecology - theory Ch 52

LAB 1 - Methods of Science - Field Ecology

M Sep 16 L5-Population ecology - real populations - Quiz 1 due 11:45 AM Ch 52

Data Analysis; Writing Short Report #1

W Sep 18 L6-Population ecology - human population growth Ch 52

F Sep 20 L7-Community interactions Ch 53

SHORT REPORT #1 due 5:00 PM Friday - 25 pts

LAB 2 - Set Up of Greenhouse Experiments

M Sep 23 L8-Community Ecology - competition between species - Quiz 2 due 11:45 AM Ch 53

W Sep 25 L9-Principles of ecosystem ecology Ch 54

F Sep 27 EXAM 1 (11:45-12:45 Bunnell Auditorium) covers lecture and lab material from September 6 through September 23. 100 points.

LAB 3 - Paramecium Population Growth;
Web Page Development
Team Presentations - Field Ecology - 15 pts

M Sep 30 L10-Role of science in building public policy - Quiz 3 due 11:45 AM [Ch 55]

Team Web Page due 5:00 PM Monday - 25 pts.

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.

W Oct  2 L11-What is a gene? [Ch 16, 15]

F Oct  4 L12-Functions of DNA [Ch 12, 13]

LAB 4 - Paramecium Competition and Predation Experiments;
Team Presentation -Population Growth of Paramecium - 10 pts

SECTION THREE

Evolution

M Oct  7  L13-Gene expression - **Quiz 4** due 11:45 AM  [Ch 17]
W Oct  9  L14-Mendelian inheritance, meiosis, and chance Ch 14
F Oct 11 L15-Mendelian genetics - 2 loci; Ch 14

LAB 5 - **Team Presentations** of Greenhouse Experiments - 25 pts
Computer Simulation of Population Growth

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M Oct 14 L16-Evolution and the process of science - **Quiz 5** due 11:45 AM Ch 22
W Oct 16 L17-Darwin and natural selection Ch 22
F Oct 18 **EXAM 2** (11:45-12:45 Bunnell Auditorium) covers lecture and lab material from
September 24 through October 14. 100 points.

LAB 6 - Genetics problem solving; Drosophila genetics
**Team Presentation** - Paramecium Experiments - 50 pts

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M Oct 21 L18-Modern evolutionary theory - **Quiz 6** due 11:45 AM Ch 22
W Oct 23 L19-Evolution - fact or theory? Ch 22
F Oct 25 L20-How evolution works; Genetic structure of populations Ch 23

LAB 7 - Genetics computer simulation;
**LAB REPORT #1** due - Paramecium experiments - 100 pts

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M Oct 28 L21-Hardy-Weinberg Model; Evolutionary change - **Quiz 7** due 11:45 AM Ch 23

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.

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W Oct 30 L22-What is a species? Ch 24
F Nov  1 L23-Biological species concept Ch 24, 25

LAB 8 - Bacteria experiments

M Nov  4 L24-History of life on earth - **Quiz 8** due 11:45 AM Ch 26
W Nov  6 L25-Monera and viruses [Ch 27, 18]
F Nov  8 **EXAM 3** (11:45-12:45 Bunnell Auditorium) covers lecture and material from
October 15 through November 4. 100 points.

LAB 9 - Monera, protista, fungi

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M Nov 11 L26-Protista and fungi - **Quiz 9** due 11:45 AM Ch 28; [Ch 31]
W Nov 13 L27-Cambrian Explosion Ch 32, 33, [34]

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.

F Nov 15 L28-Plant diversity and evolution Ch 29

### LAB 10 - Animal diversity

**Short Report #2** due - bacteria experiments - 25 pts

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<tr>
<th>M</th>
<th>Nov 18</th>
<th>L29-Mosses; Ferns Ch 29</th>
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<tr>
<td>W</td>
<td>Nov 20</td>
<td>L30-Conifers - <strong>Quiz 10</strong> due 11:45 AM Ch 30</td>
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<td>F</td>
<td>Nov 22</td>
<td>L31-Angiosperms p606-613(565-572); p783-793(730-738)</td>
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<td><strong>LAB 11</strong> - Harvest Greenhouse Experiments</td>
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<th>M</th>
<th>Nov 25</th>
<th><strong>EXAM 4</strong> (11:45 - 12:45 Bunnell Auditorium) covers lecture and material from November 5 through November 22. 100 points.</th>
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<td>W</td>
<td>Nov 27</td>
<td>L32-Angiosperm diversity</td>
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<td>Nov 29</td>
<td><strong>NO CLASS</strong> - Thanksgiving Holiday</td>
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<td><strong>LAB 12</strong> - NO LAB this week</td>
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<th>Dec  2</th>
<th>L33-Plant structure and function Ch 35</th>
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<td>Dec  4</td>
<td>L34-Acquisition of external growth resources Ch 10; Ch 37</td>
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<td>F</td>
<td>Dec  6</td>
<td>L35-Allocation of internal growth resources Ch 36; Ch 39</td>
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<td><strong>LAB 13</strong> - Data Analysis - Greenhouse Experiments; <strong>Short Report #3</strong> due - Drosophila genetics - 25 pts</td>
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<th>Dec  9</th>
<th>L36-Plant life cycles - seed dispersal and dormancy Ch 38</th>
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<td>W</td>
<td>Dec 11</td>
<td>L37-Plant life cycles - seed germination and growth - <strong>Quiz 11</strong> due 11:45 AM Ch 38</td>
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<td>Dec 13</td>
<td>L38-Plant life cycles - reproduction Ch 38</td>
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<td><strong>LAB REPORT #2</strong> due - Greenhouse Experiment - 5:00 PM Friday -100 pts</td>
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<td><strong>LAB 14</strong> - <strong>Team Presentations</strong> - Greenhouse Experiments -100 pts;</td>
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| M    | Dec 16 | **FINAL EXAM** (10:15 am to 12:15 pm Bunnell Auditorium) covers lecture and laboratory material from November 27 through December 13 (100 points) and reviews material from earlier in the course (100 pts). 200 points total. |

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**To Biology 105 Home Page**

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http://mercury.bio.uaf.edu/courses/biol105/syl02.html