BIOL 100A - General Biology
Fall 2010

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Course Materials (required):
   Mastering Biology and rebate coupon for iclicker
2. iclicker, available in the CCSF bookstore annex
3. Pogge, Crima. Biology 100A Laboratory Exercises Fall 2010; available online at
   http://fog.ccsf.edu/~cpogge/Lab/labhome.html.
4. Safety goggles, color pencils, permanent ink pen and pencil # 2 HB for exams
5. Laboratory notebook as described in "Introduction to Laboratory"

Course Goals:

Concepts (dry version)
Become familiar with the factual material about biological chemistry; cell structure and function;
sexual reproduction and Mendelian genetics; DNA replication, transcription, translation; genome
regulation, evolution, biotechnology and animal form and function.

Concepts (the real plot)
Become familiar with cells, which are the smallest and most basic units of life. You can compare
cells to miniature factories cranking out thousands of molecules every minute: adhesives
stronger than super glue, catalysts that can speed up reactions by a factor of $10^{-7}$,
communication devices more efficient than the most sophisticated computer network. Cells
transform energy about twice as efficiently as gasoline engines, and they do this without
producing noise and pollutants.

For five months, at least 13 hours a week, you will immerse yourself in how cells accomplish
these incredible feats. Among other things, we will investigate how penicillin and taxol (an anti-
cancer drug) affect cells, how DNA is repaired and what happens if the damage is too
substantial. We will find out what causes Down syndrome, why vitamins are so important, and
why people on chemotherapy often lose their hair. Use these months to get acquainted with
cells, to get a glimpse of the miracle of life, and to start feeling at home in the world of cells.

At the end of the semester, we will apply the knowledge about cells to understand how animals
cope with the challenges of staying alive. We will explore how cells work together to cope with
the challenges of life: reproduction, energy conversion, waste excretion, homeostasis, etc.

Skills
Gain hands-on experience of what biologists do. Above all, that means making careful
observations, asking specific questions, generating hypotheses, and understanding your
assumptions. It means designing and carrying out tests to disprove your hypotheses, and
making sense of your results in light of what you know about biology. Testing your hypotheses
involves learning how to correctly use particular equipment, such as microscopes, centrifuges,
pipettors, and thermal cyclers. It also involves practicing laboratory techniques, for example,
extracting and amplifying DNA, creating recombinant bacteria (bacteria that contain genes of two different bacterial strains), and identifying subcellular structures. But above all, we will apply the scientific method to particular questions about cells.

The Secretary of Labor’s Commission on Achieving Necessary Skills has identified particular competencies as essential for success in all jobs (the SCANS competencies, see laboratory manual appendix). Throughout the course, I have incorporated exercises and assignments that give you a chance to practice these skills. The objectives of each laboratory exercise will highlight which of those competencies are addressed so that you can connect what you learn in college to the skills you will need in your profession. You will find a list of skills covered in Bio 100A at http://fog.ccsf.edu/~cpogge/labguides1.html. Use the list when applying for a lab related job!

You might be surprised to find that one of the competencies I emphasize a lot in this class is your writing skill. Didn’t you just read above that biology is about hypothesis testing and using equipment? Yes, of course, but consider that prior to, during and after the doing, you have to think and plan carefully; otherwise you risk losing time, materials, and money. Writing provides a way to clarify your thinking, to sharpen your observation skills, to evaluate connections between cause and effects, and to refine your conclusions. In addition, what good will your fabulous research do anyone, including yourself, if you are not able to communicate your findings accurately, concisely, and clearly? You would not be the first great scientist sailing by the Nobel price because of poor communication skills! And you would not be the first student to miss points on exams because even though you thought you knew the material, or even though you really do, you suddenly draw a blank when you have to write down what you know.

Course Format

Lecture
For each lecture module, there will be a reading/study guide available on the web at: http://fog.ccsf.org/~cpogge/. Please read the assigned text and answer as many of the study guide questions before coming to lecture. You will get much more out of the lectures, promise! Lectures are interactive, making use of the personal response system iclicker, so be on time and don’t miss practice points.

Laboratory
Please download the lab exercises from http://fog.ccsf.edu/~cpogge/labguides1.html early and read the exercise for the day prior to coming to lab. Most of the time you will be required to write a protocol for the lab to come. Try to understand the theory behind each experiment, and have a good idea of what you will be required to do. You are required to keep a laboratory notebook and submit a lab report after some exercises. You should be prepared to contribute your results to the discussion at the beginning of each lab session.

Discussion
You are required to attend one hour of discussion in your lab section. In this hour, we will go over study guide questions together and practice answering essay questions. Please see the file “How to succeed in Bio 100A” at http://fog.ccsf.cc.ca.us/~cpogge/Lecture/discussion.html for more information.

Attendance
I expect you to submit all assignments on time, to attend all lab/discussion meetings, and to be
there on time (more SCANS competencies). Learning biology is not about memorizing textbook material but rather about engaging in a discourse about biology. Your participation and feedback will be a vital part of this class. However, I realize that things happen that might prevent you from coming to class. You can miss three lectures, two labs and one discussion section without penalty, except losing clicker points. After that, I will deduct 20 points for a missed lab or discussion, and I reserve the right to drop you from the class or fail you if you miss three labs or more. Labs and lab exams cannot be made up because they involve extensive setup of materials. Lab rules will be explained in the first lab and are strictly enforced. Let me know in advance if special circumstances prevent you from turning in assignments in time or from coming to class. If I know it in advance, I often can work something out with you.

Grading
The grade is based on the number of points you accumulate during the semester. See the file “Assignments” at http://fog.ccsf.edu/~cpogge/labguides1.html for a breakdown of assignments and maximum points. Lecture exams will mostly consist of multiple choice, short answer and essay questions. Lab practicals will be short answer questions and practical skill demonstrations.

You are responsible for turning in your assignments on the due date. If you turn an assignment in late, 10% of the possible points will be subtracted for each school day it is late the first time only. A second late assignment will not receive any points.

A: 100-90%, B 89.9-80%, C 79.9-70%, D 69.9-60%, F < 60%.

Tutors, mentors, and the Biology Resource Center
Mentors and tutors are available in the Biology Resource Center and the Learning Assistance Center to help you with study strategies, homework assignments, and class material. Please let me know early in the semester, whether you would be interested in working with a tutor or mentor on a regular basis.

Professional Conduct (another SCANS competency)
I will work hard to make this a course from which you can learn much and develop important skills. I welcome suggestions from you at anytime about whatever you think might enhance your learning experience. In exchange, I expect you to be prepared, come to labs and discussions on time and stay until class is over without making unnecessary noise that could distract your classmates and instructors. Use of cell phones in the classroom is not allowed. I reserve the right to count you as absent if a) you have been late for more than two times and b) for the class period in which I observe you using a cell phone or your laptop for activities unrelated to the class.

As much as I want you to do well in the class, I will not tolerate academic dishonesty. Academic dishonesty includes cheating, plagiarizing (taking credit for the work of others), and knowingly providing false information. You can find more information about City College's policies on dishonesty in both the City College catalog and the Student handbook. Please review the information on plagiarism at http://fog.ccsf.edu/~cpogge/labguides1.html.

NB: All of the information in this syllabus is subject to change if necessary.