## Biology 100: Introductory Biology - Spring 2012

### Syllabus and Course Information

<table>
<thead>
<tr>
<th>Instructor: Ken Marr</th>
<th>Office Hours</th>
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<tbody>
<tr>
<td>Office: SC-214</td>
<td>Mondays</td>
</tr>
<tr>
<td>Phone: (253) 833-9111 x 4204</td>
<td>9:00 – 10:50 a.m. in SC-240 or SC-214</td>
</tr>
<tr>
<td>E-mail: <a href="mailto:kmarr@greenriver.edu">kmarr@greenriver.edu</a></td>
<td>Wednesdays</td>
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<tr>
<td>Biology 100 Class Website: <a href="http://www.instruction.greenriver.edu/kmarr">http://www.instruction.greenriver.edu/kmarr</a></td>
<td>9:30 – 10:50 a.m. in SC-240 or SC-214</td>
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<td></td>
<td>Fridays</td>
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<tr>
<td></td>
<td>9:30 – 10:50 a.m. in SC-214</td>
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<td></td>
<td>And by appointment!</td>
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### Class Meeting Times:
- **Lecture** (in SC-240): Sections A and B: Monday: 8:00 – 8:50 a.m.; Wednesday and Friday: 8:00 - 9:30 a.m.
- **Lab** (in SC-255): Section A: Tuesday: 8:00 – 9:50 a.m.; Section B: Thursday: 8:00 – 9:50 a.m.

### Course Description

This is a one-quarter introductory biology course for non-biology majors and students wishing to update their biological knowledge before taking other biology courses or human anatomy/physiology. Topics include the process of science, natural selection, molecules of life, cell biology, cell division, DNA and protein synthesis, Mendelian and human genetics, biotechnology, and selected topics from human and animal physiology. Examples will be taken from all the domains of life. **Satisfies math/science/lab distribution requirement for AA degree.**

The topics studied include:
- The process of science & Natural Selection
- How cells work (cell structure & function)
- Cellular Respiration and photosynthesis
- How genes are passed on from parent to offspring and the role of natural selection
- The molecular basis of heredity
- Biotechnology
- How cells obtain energy
- Biology of Aging: Processes responsible of aging and methods to slow the aging process

A strong attempt will be made to show the relevance of these topics to your life and to help you to learn on your own once you leave this class.

### Mode of Instruction: Active Learning with little to no lecture

Welcome! You are about to embark on a journey that may change your view of biology and will surely change your view of science and learning. In this course through guided inquiry learning exercises and collaborative group work and a minimum of lecturing you will generate knowledge about biology. Your instructor will serve as a facilitator, and a resource for information. This method of learning will allow you to practice thinking, speaking, and writing as you formulate answers to daily guided learning group exercises that use the "POGIL" approach (more info at [www.pogil.org](http://www.pogil.org)). You will be actively involved everyday in a variety of activities so class is interesting (we hope!) and you won’t want to miss. You will probably learn much more biology in this course than in others where an instructor only lectures to you.

Why the use of guided inquiry activities and collaborative learning in place of lectures? A wealth of research over the last 20 years indicates that little learning occurs during passive learning (i.e. lectures) and that lectures, at best, only indicate what students should study outside of class. Moreover, controlled studies show that students involved in collaboratively taught classes out-perform those in the same course where lecturing is the major means of instruction.

You may find that collaborative/active learning requires an extensive effort from you. In addition, a few initially feel uncomfortable with this new style of instruction/learning. This is not unusual, in part because the majority of our past classes were taught in the traditional way...Recall the old adage, “It’s hard to teach an old dog new tricks”? Collaborative/active learning will force you to do the required readings/exercises every day, and in the process will allow you to develop more effective study strategies/habits, to use your study time outside of class more effectively. In time you will become more familiar and comfortable with your classmates and feel more at ease during group/class discussions. **The skills that you learn and practice through active learning and collaborative group work in this class will stay with you and serve as a firm foundation for success in other classes and when you study at the university level.**
Biol 100 Prerequisites
The following are needed for success in this class:

- Availability and willingness to spend 2 hours of quality study time outside of class for every hour in class (i.e., 12-14 hours per week—about 2 hours daily.) **WARNING!** It is unlikely that you will do well in this class if you do not invest this amount of time!
- Good reading, writing, oral communication, and critical thinking skills (Effective summer 2012, **Engl 101** will be a prerequisite for Biol& 100 and all other science classes at GRCC.)
- Good study habits, a curious/active mind, and an interest in biology are strong assets.

Course Materials (available in the GRCC bookstore)
- Textbook (required):
  - *Essentials of Biology* by Sylvia Mader, 3rd ed. ($143 at GRCC bookstore)
  - *Connect Online Access* is required for class assignments and quizzes. A user specific access code is included with the purchase of a new textbook or costs $36.75 if purchased at the textbook’s website:
    - Sec. A: http://connect.mcgraw-hill.com/class/k_marr_section_a_3
    - Sec. B: http://connect.mcgraw-hill.com/class/k_marr_section_b_4
  - The e-book is a cheaper option: Connect Plus Online Access (*Essentials of Biology* e-book and access to Connect) $40 at the publisher's Website.
  - The textbook has a free website with loads of useful study aids (this site is not the same as the Connect website!): http://highered.mcgraw-hill.com/sites/0073525510/student_view0/
- Do not purchase the Biology 100 Lab Packet. Print all lab handouts from the class website.
- 3 ringed notebook for handouts, notes, etc.
- Optional: simple scientific calculator, 6 inch ruler, small pocket stapler for stapling assignments in class (often a stapler in not available in the lecture or lab room!)

Special Needs
If you believe you qualify for course adaptations or special accommodations under the Americans with Disabilities Act, it is your responsibility to contact the Disabled Students Services Coordinator, (253) 833-9111, ext. 2631, and provide the appropriate documentation. If you have already documented a disability or other condition, which would qualify you for special accommodations, or if you have emergency medical information or special needs I should know about, please notify me during the first week of class. You can reach me by phone at (253) 833-9111, ext. 4204, or you can schedule an office appointment to meet me in SC-214 during my posted office hours, or at another mutually determined time.

Grading Policy

<table>
<thead>
<tr>
<th>2 Midterm Exams</th>
<th>% of Grade</th>
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<tbody>
<tr>
<td>(If it helps your grade, your lowest exam score will be replaced with your final exam %.)</td>
<td>30%</td>
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<tr>
<td>Final Exam</td>
<td>20%</td>
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<tr>
<td>(Comprehensive—covers material for the entire quarter)</td>
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<tr>
<td>Lab Reports (8 reports: one report per lab activity)</td>
<td>20%</td>
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<tr>
<td>Issues Project Assignments</td>
<td>15%</td>
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<tr>
<td><em>McGraw-Hill Connect</em> online assignments, In-class assignments and &quot;clicker&quot; quizzes</td>
<td>15%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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Grades are calculated as follows:

Quarter % = 0.3(exam %) + 0.2(final exam %) + 0.2(Lab %) + 0.15(Issues Proj %) + 0.15(Connect & class assignments %)
Protect your GPA—Read This!!

- Students that earn less than 62%, or who stop coming to class without officially withdrawing by the end of the 8th week of the quarter, will receive a grade of 0.0 This grade will be included in college GPA calculations.

- Keep track of your grades!!!! It is strongly recommended that you keep track of all of your grades throughout the quarter on the grade record sheet found towards the end of this packet. There are two excellent reasons to do this:
  - If you keep track of your grades on individual assignments, you can estimate your class grade at any point in the quarter.
  - Instructors have been known to make record keeping mistakes. Protect yourself by keeping good records.

Pass/No Credit Grade Option

Students may elect to be evaluated on a "Pass" or "Non-Credit" basis rather than by decimal grades by filing a petition with enrollment services (253) 833-9111 ext 2500 no later than the end of the 8th week of the quarter. For students who qualify, the registrar will convert the decimal grade submitted by the instructor either to credit (P) or to no credit (NC)—as per GRCC policy, a decimal grade ≥ 1.5 is required for a “P” grade. Caution! Many universities will not award credit for a science or math course with a “P” grade if the course is required for a specific major (e.g. Biology, Pre-medicine, Pre-dental, etc.)

Content Specific Learning Outcomes in this class include...

1. Understand, apply and summarize the steps of the scientific method.
2. Explain the role of the environment in natural selection.
3. Understand the basic principles and ideas that underlie the chemical basis of life.
4. Identifies the functions of the four classes of biomolecules and the monomers of each class.
5. Explain the concept of a cell and identify the structure and functions of cellular organelles.
6. Understand the relationship between bioenergetics, photosynthesis, and cellular respiration.
7. Understand the basic principles of inheritance as explained by Mendel and classical genetics.
8. Able to explain the concepts of DNA replication, transcription, translation as they relate to cell function, phenotype and cell division.

These outcomes will be demonstrated by active participation in small and large group discussion, success on exams and quizzes, short and long writing assignment

Campus-Wide Learning Outcome addressed in Biology 100

Critical Thinking

1. Apply relevant criteria and standards when evaluating information, claims and arguments.
2. Use appropriate reasoning to evaluate problems, make decisions and formulate solutions.
3. Give reasons for conclusions, assumptions, beliefs and hypotheses. These outcomes are demonstrated by, but not limited to one or more of the following types of assessment:
4. Seek out new information to evaluate and reevaluate conclusions, assumptions, beliefs and hypotheses.
5. Exhibit traits evidencing disposition to reflect, assess and improve thinking or products of thinking.

These outcomes are demonstrated by, but not limited to one or more of the following types of assessment: 1) active and meaningful participation in seminars, 2) portfolio, 3) case study analysis, 4) class and group discussions, 5) short and long writing assignment, 6) oral presentations, 7) attendance.
Assessment

Exams

- There will be **three exams**: two midterm exams and a comprehensive final exam. The midterm exams consist of short answer and/or objective in nature—see the schedule on the last page for exam dates. These exams will cover material from all aspects of the course, the guided inquiry worksheets, labs, homework exercises, and your readings. The guided inquiries, class & lab activities, class notes and exam study guides posted at the class website will guide you to the material that we think is particularly important. The exams will be designed to probe deep understanding of the concepts and principles involved, and an ability to apply these concepts to novel situations rather than a memorization of detail.

- Exam scores are not "curved" making it possible for everyone in the class to earn a high grade. Moreover, each exam includes several extra credit questions allowing for the possibility of a score greater than 100%.

- There will be **no make-ups**; however, if it helps your grade, your lowest exam score will be replaced with the percentage score you earn on the comprehensive final exam. **Missed exams cannot be made up.**

- A comprehensive final exam (~ 2 hours long) will be given during final exam week. Everyone is required to take the final exam. **Make your travel plans now, as there will be no early exams.**

Issues Project

Each of you will work with a group on an issue related to genetics or cellular biology. You will choose your issues project topic during the 3rd week and work on the project during the entire term. For further details, please see the Issues Project handout under the lab section of the class website. The project, worth 15% of your grade, consists of three parts:

- Project References: 25 points (individual grade)
- Progress Report: 15 points (team grade)
- Project Abstract and References: 15 points (team grade)
- Presentation: 150 points (team grade)
  - Each team will present their issue in lab during week 10. Late presentations will not be accepted. Failure to participate in the team presentation will adversely affect your grade (50% penalty).

Group Activities and "Clicker" Quizzes

Individual "Clicker Quizzes" and collaborative group activities may occur at anytime during the quarter in lecture and/or in lab. For example, your group may work collaboratively on a quiz, written exercise or worksheet. **All members of the group will receive the same grade—hence, helping to prepare your team members can enhance your own score.** Points may be deducted from the scores of individuals that come to class unprepared and/or that have missed class during the week—in these cases students may only earn half of the group score. If you have a problem with all group members receiving the same score (sometimes it’s not justified!), **let me know your concerns.**

Lab Activities

- Lab day is **Tuesday for Section A** and **Thursday for Section B** in SC-255. Do not miss lab! Since this is a lab science course, **lab attendance is mandatory to pass this class**—see "Lab Attendance" on the next page for details.

- Some lab assignments will be turned in at the end of each lab, others on a date announced in class.

- With the exception of the Pea Lab (25 pts.) all lab assignments are worth **20 points**.

- In an effort to promote collaboration and cooperation (NOT plagiarism!), one lab report may be selected at random from your lab group for evaluation. In this event, all group members will receive the same grade. Other times, your group will decide whose report is selected for evaluation. Again, a group grade is given. **If this policy is not working fairly** (e.g. One of the group members is a “slacker”), **contact your instructor immediately to work out a solution.**

- Most labs cannot be made up because they involve additional materials. **If you miss a lab because of an illness, contact your instructor as soon as possible to see if you can make up the lab.**

Late Work Policy (Does **not** apply to stamped assignments such prelab questions and guided inquiry worksheets)

Turn your work in on time! Late work will be penalized as follows: **10% off per day late**—maximum **4 days late. No credit if more than four days late.** Assignments due on a Friday that are turned in on the following Monday will be penalized 20%. An assignment is late if it is due at the start of class and it is not turned in at that time, or if an assignment is due at the end of class and the assignment is not turned in at that time.

Guided Inquiry Worksheets

There will be 2 to 3 guided inquiry worksheets (a.k.a. Active Learning Exercises or "ALE’s") assigned each week that are designed to help you learn the major concepts studied this quarter. Questions and concepts from the guided inquiries, textbook readings and lab exercises will be included on the exams and quizzes.
Classroom Policies

The following policies are in effect for this class:

- **Attendance.** Participation in the class is an important part of your success in this course, and you will be expected to attend at all times. Treat this class as if it were a job: When you cannot be in class it is expected that you will notify the instructor and your team of your inability to attend. A voice mail or e-mail message before the missed class, or as soon as possible, will be sufficient.

- **Lab Attendance.** Since this is a lab science course, attendance is mandatory for lab. You will not receive credit for any lab you do not attend. You will not pass the course if you miss three or more labs. Please note that some Lab experiments may be difficult to make up. Therefore, strive not to miss lab! If for an extraordinarily good reason you do miss lab, you must make arrangements with your instructor to make up the missed lab assignment during the week that it was assigned. The materials for any given lab activity are only available and maintained for student use through the end of the week that the lab was done by the class. On Fridays, all lab materials for that week are put away. Some labs may not be made up.

- **Cell Phone / Electronic Device Policy.** To reduce disruptions, and out of respect to the instructor and students, class policy is that all cell phones and all non-note taking devices (including pagers, wireless devices, music players, etc.) must be silenced and put away during class. Your teacher recognizes that emergencies do happen. If you feel you need to answer your cell phone during class, please leave the room quietly and take the call or text message outside. You do not need to ask permission, just try not to disturb your fellow students. Exception: During an exam or quiz you will FAIL if the instructor or a testing center employee sees your cell phone--this policy applies even if the phone is turned off and/or not in use.

- **Professional Conduct.** Your instructor will work hard to make this a course from which you can learn much and develop important skills. Suggestions are welcome from you at anytime about things you think could be done to improve the course. In return, we ask that you arrive at lab and lecture on time and stay until class is over without making unnecessary noise that could distract your classmates. In short, we promise to respect you as students and as individuals, and ask that you return that respect to your instructor and to your classmates. We want you to learn and to do well in the course, but academic dishonesty will not be tolerated. If you find yourself in trouble or if you are aware of academic dishonesty occurring, please talk to the instructor. Personal crises do happen. If you are having difficulties that are interfering with your ability to do well in the class, please tell the instructor as soon as possible. We may be able to refer you to someone for help or to make special arrangements if the need is real and if you have done your best to deal with the situation in a timely manner.

- **Academic Honesty.** Students are expected to produce original work. Another person’s ideas, data, graphics, or text may be used with permission of the creator of the work if the original source is given credit. Plagiarism occurs when you knowingly submit someone else's ideas or words as your own. Plagiarism is an act of intentional deception that not only is dishonest, it robs you of the most important product of education—learning. Should I suspect that you have plagiarized, I will talk with you one-on-one and ask you to prove that the work in question is your own. If you are found guilty of academic dishonesty, you will automatically fail that assignment with a score of zero. If you are caught plagiarizing again in the same quarter, you will fail this class. Examples of plagiarism include copying on exams, copying assignments, falsification of data or calculations, supplying an assignment, data, etc. for another student to plagiarize, etc. A person that allows their work to be plagiarized is just as guilty as the one copying the work. Academic dishonesty will not be tolerated and can result in failure of this course and a letter sent to the Dean. (WAC 132J-125-200)

- **Inappropriate conduct**—will be addressed verbally as a first warning. The second offense will be addressed in writing to the student and the Dean. The third offense may result in permanent removal from class. WAC 132J-125-210

- **Anti-discrimination**—Discriminatory/derogatory language or actions regarding race, gender, ethnic/cultural background, sexual orientation, and physical/mental abilities will not be tolerated.

- **Safety**
  1. Notify the instructor immediate when injury occurs.
  2. Immediately discuss with the instructor any situation that you feel may be dangerous or cause you discomfort.
  3. Use proper, safe techniques regarding personal safety.
  4. Use equipment for its intended purpose only, as instructed by the instructor. While enthusiastic participation is encouraged, the class will remain an academic environment in which learning can take place.
Guidelines for Completing Biology 100 Assignments and using the Textbook

1. **Overview.** Strive to have all assignments completed with quality responses well before the due date—last minute help is often hard to find! Strive to start as far in advance as possible and complete a few pages each day—don’t sit down the day before and attempt to complete the whole assignment in one shot—little long-term learning will occur! With a diligent effort most students can complete most the questions without much outside help. However, don’t panic if you do not understand everything. This is to be expected! Use class time with your group to tie up loose ends. Sources of help include: meeting with a study group outside of class time, the help/tutoring center on the 2nd floor of the GRCC library and meeting with your instructor during office hours.

2. **Using your textbook as a resource.** Find the relevant chapter or sections in the textbook. To get an overview of the chapter read the chapter introduction and chapter outline on the first page of the chapter, the sectional headings, the captions of all diagrams/illustrations and then the chapter summary at the end of the chapter. Now skim over the assignment to get an idea of the information you wish to find while reading the entire chapter or the relevant sections within the chapter.

3. **Probe your understanding of the assigned reading in the textbook.**
   - Prior to reading a chapter probe your current knowledge by taking the chapter's Pretest at the textbook's website: [http://highered.mcgraw-hill.com/sites/0073525510/student_view0/](http://highered.mcgraw-hill.com/sites/0073525510/student_view0/)
   - As you read the textbook answer the "Check Your Progress Questions" within each section of a chapter. Check your responses with those in the book and seek extra help as needed.
   - After reading a chapter attempt the "Testing Yourself" and "Thinking Scientifically" questions at the chapter's end. Check your responses with the answer key in Appendix A and seek extra help as needed.
   - Now test your knowledge by taking the Chapter Post-Test at the textbook's website: [http://highered.mcgraw-hill.com/sites/0073525510/student_view0/](http://highered.mcgraw-hill.com/sites/0073525510/student_view0/)

4. **Using the Book’s Index.** Avoid the temptation of simply scanning the index or glossary of textbook for the page(s) that relate to a question and transcribing (copying/plagiarizing) portions as your response to a question. Although you will get some nifty sounding answers, you will have learned very little in the process.

5. **Plagiarism.** Don’t complete any of your assignments by copying answers from your friends and classmates. To do so prevents you from meaningful and long-term learning. You will get out of this class only what you put into it. The process starts with you alone thinking about the questions on each assignment, finding pertinent information and formulating answers. If you find yourself copying or wanting to copy answers from other students because you are not ready and have not done the work required, you should seek immediate help and/or consider dropping the course. Without a strong individual effort you will not succeed in learning very much and group activities might make you feel uncomfortable because your mastery of the material will be well behind the rest of the class. Please seek immediate help as needed from all sources available, such as: classmates, the help/tutoring center on the 2nd floor of the GRCC library and your instructor.

6. **Put Answers in your own words.** When you can formulate an answer to a question in your own words, you have mastered the concept and should do well on the exams and quizzes. If you have copied answers (either from the text or a friend) you have only gotten practice in writing and have learned little to nothing at all. Because you will not have your friend or text to copy from during the exam, you will do poorly. *Memorization gets you nowhere in this class—learning major concepts gets you everything.*

7. **Alternate Resources.** Sometimes you will not find all the information you need to properly formulate your answers to assigned questions. If this is the case, you will need to consult other resources, such as online resources, the library, a dictionary, etc.
The Road to Success—Some Tips...

1. Stay focused: don't let life's distractions derail you from your personal, academic and/or career goals:
   - Keep a positive attitude.
   - Dedicate your energy towards actions that will help you to be successful.
   - Work hard to achieve your goals, and
   - Have confidence in yourself!

2. If you need extra help in this class (or any other class!), take advantage of the instructor’s office hours and the help center in the 2nd floor of the Holman Library.

3. Visit the instructor's website (http://www.instruction.greenriver.edu/kmarr) and the Textbook's website (http://highered.mccgraw-hill.com/sites/0073525510/student_view0/) for this class often since they have many useful study aids, animations, practice quizzes, practice pre- and posttests, and more!

4. Many students benefit greatly by being involved in a study group consisting of other members of this class. If you wish, exchange phone numbers and email addresses A.S.A.P. with a few people in this class.

5. Be intellectually active in class: participate actively in class discussions and ask questions.

6. Do the assigned reading and complete the Guided Inquiry Worksheets before the material is discussed in class. Make a list of questions you have concerning the assigned reading and/or the questions on Guided Inquiries. Be sure to get clarifications during class time, with your study group, and/or during office hours.

7. Review and rewrite your class notes and the relevant material in your textbook immediately after class or as soon as possible.

8. Study daily: Develop a study plan in which you will study for this class at least 2 hours daily 7 days a week. Just as one cannot train for a marathon by training sporadically for several hours at a time, one can’t study sporadically for long periods of time and expect to learn with retention. Regular study sessions of one-hour duration or less are more effective than massive cram sessions.

9. Isolate yourself from distractions while studying.

10. Study efficiently: Don't waste too much time on a tough problem or concept. Go on to the next problem and come back to the real stumpers later. Get help as needed from your fellow classmates and from your instructor. Often it’s only a few small details that may keep you from understanding something—what seems like a major stumbling block might in reality be something minor!

11. Studying for an Exam
   - Learn from your instructor the type of exam (essay, multiple choice, etc.)
   - Study daily throughout the quarter
   - See the class and textbook websites for study guides and practice questions.
   - Set up a study schedule and review all materials well before the exam.
   - Write out likely questions and answer them.
   - Form a study group, discuss the materials you will be tested on, and quiz your partners.
   - Get enough rest the night before an exam.

12. Taking a Multiple Choice Exam
   - Read each question carefully—underline key words within each question.
   - Before looking at the possible answers, form an answer in your mind.
   - Read each possible answer before making a choice.
   - Watch for words such as always, never, only, or except.
   - Don’t change your initial answer unless you are absolutely certain it’s wrong.

13. Taking an Essay Exam
   - Survey all essay questions and note the questions that are easy for you.
   - Estimate how much time you have to answer each question.
   - Answer easier questions first to build your confidence.
   - Read each question several times to ensure that you understand what is being asked—underline key words such as analyze, discuss, define, or describe.
   - Take a few moments to brainstorm and create a rough outline of your response.
   - Support each major idea with specific examples and detailed information.
   - Remember to begin each answer with an introduction that gives an overview of your response.
   - Conclude by briefly summarizing your answer.

How to Boost your Learning Skills. Do you run out of time on exams? Do you struggle to finish reading assignments? Is Time Management your Achilles heel? Have your grades reached a plateau? Check out the Get Help with Academic Skills page at Stanford University for tips to boost your learning skills: http://www.stanford.edu/dept/undergrad/cgi-bin/drupal_uul/ARS_help_academic_AcademicCoaching.html (See "Study tips resources" at the bottom of this page)
Biology of Aging Reading Assignments

For links to the following reading assignments and an up to date list of reading assignments go to the Biol& 100 class webpage at [http://www.instruction.greenriver.edu/kmarr/Biology100/BioAging/BioAgingHome.htm](http://www.instruction.greenriver.edu/kmarr/Biology100/BioAging/BioAgingHome.htm)

Theories of Aging

Caloric Restriction
1. Visit the caloric restriction guru’s (Roy Walford) website for information about caloric restriction—you’ll find diets, menus, calorie counters and more: [http://www.walford.com/](http://www.walford.com/)
2. Visit the Calorie Restriction Society’s website: [www.calorierestriction.org](http://www.calorierestriction.org) The Calorie Restriction Society is a worldwide organization that focuses attention on the “CR diet”, the most heavily researched diet in history—and the most healthy diet known in history -- proven by 70 years of laboratory experiments to extend both the maximum years of life, and the maximum years of health, a unique claim that no other diet can make.

Cellular Senescence

Personal use of caloric restriction (Optional Reading)
1. Visit Roy Walford’s website for more information about caloric restriction—you’ll find diets, menus, calorie calculators and more: [http://www.walford.com/](http://www.walford.com/);
Read Roy Walford’s obituary—he led a very colorful life: [http://www.grg.org/RWalford.htm](http://www.grg.org/RWalford.htm)

Misc. Resources (Optional Reading)
1. Alliance for Aging Research—The nation's leading non-profit organization dedicated to improving the health and independence of Americans as they age through public and private funding of medical research and geriatric education. An excellent source of information about how the environment and genes interact in the aging process: [http://www.agingresearch.org/](http://www.agingresearch.org/)
2. Aging Research Center—links to cutting edge research papers in the field of aging: [http://www.arclab.org/](http://www.arclab.org/)
Guidelines for Class Participation—a self-test!

Sometimes people think that class attendance and participation merely involves coming to class, taking notes, and perhaps participating occasionally in class discussions. However, true participation is much more than this. You can evaluate your level of participation by using the following guidelines.

1. Participation (25%)

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<th>Do</th>
<th>Don’t</th>
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<tbody>
<tr>
<td>• Complete homework and reading before class</td>
<td>• Do homework during class</td>
</tr>
<tr>
<td>• Have necessary materials (textbook, paper, pencils, assignments stapled and ready to turn in, etc.)</td>
<td>• Do assignments from another class during class</td>
</tr>
<tr>
<td>• Sit in front or middle of class</td>
<td>• Arrive late and disrupt the class by asking what’s happening</td>
</tr>
<tr>
<td>• Arrive early after having reviewed notes and reading from the previous class session</td>
<td>• Have to borrow materials from classmates</td>
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2. Behavior (50%)

<table>
<thead>
<tr>
<th>Do</th>
<th>Don’t</th>
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<tbody>
<tr>
<td>• Pay attention and focus on the day’s lesson</td>
<td>• Talk when others are answering or talking</td>
</tr>
<tr>
<td>• Volunteer answers</td>
<td>• Shout out answers without being called on</td>
</tr>
<tr>
<td>• Ask questions appropriately</td>
<td>• Take the discussion off the main topic</td>
</tr>
<tr>
<td>• Maintain a balance of speaking and listening during discussions and group activity</td>
<td>• Attack others verbally</td>
</tr>
<tr>
<td>• Make constructive comments</td>
<td>• Sleep in class at anytime</td>
</tr>
<tr>
<td>• Help make a friendly learning atmosphere in class</td>
<td>• Text or use a cell phone in class or in the lab</td>
</tr>
<tr>
<td>• Silence and put away your cell phone before class starts</td>
<td>• Dominate discussions</td>
</tr>
<tr>
<td></td>
<td>• Engage in “horseplay”</td>
</tr>
</tbody>
</table>

3. Body Language (25%)

<table>
<thead>
<tr>
<th>Do</th>
<th>Don’t</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Look at the speaker during lecture/discussion</td>
<td>• Repeatedly look at the clock</td>
</tr>
<tr>
<td>• Nod or shake your head to show understanding/agreement</td>
<td>• Slouch or sprawl in your seat</td>
</tr>
<tr>
<td>• Use facial expressions to show understanding/agreement</td>
<td>• Put your head down on your desk</td>
</tr>
</tbody>
</table>

4. Evaluate your level of Participation by filling in the table below

<table>
<thead>
<tr>
<th>Always</th>
<th>Usually</th>
<th>Often</th>
<th>Sometimes</th>
<th>Seldom</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0</td>
<td>3.0</td>
<td>2.0</td>
<td>1.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Preparation (25%)

Decimal Grade = ( ) x .25 = __________

Behavior (50%)

Decimal Grade = ( ) x .50 = __________

Body language (25%)

Decimal Grade = ( ) x .25 = __________

Your Total = ________
Biology 100 Grade Record Sheet

It is recommended that you use the table below to keep track of your grades as the quarter progresses. Ensure that you totals agree with the instructor’s at the end of the quarter.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points Scored</th>
<th>Points Possible</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lab Activities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#1 Scientific Method</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>#2 Microscope and Cells</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>#3 Diffusion and Membrane Transport</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>#4 Pea Lab</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>#5 Energy Harvest: Alcoholic Fermentation</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>#6 Mitosis and Online Karyotyping</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>#7 Mendelian Genetics</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>
| #8 Extracting DNA from Your Cells | 20 | **Lab %**
| **Issues Project** | | |
| References | 25 | **Issues Proj %**
| Poster Plan/Presentation Plan | 15 | |
| Project Abstract and References | 15 | |
| Group Presentation | 150 | |
| **Total points for lab** | | |
| **Exams** | | |
| #1 | 100 | |
| #2 | 100 | **Total points for exams**
| **Final Exam** (If it helps your grade, your lowest exam score is replaced with final exam %) | | **Final Exam %**
| **Total Points on final exam** | 150 | **Total on Connect, In-class assignments/ clicker quizzes**
| Connect, class assignments and clicker quizzes | | **Connect, etc %**

Quarter % \(= (0.2) \text{ (lab %)} + (0.15) \text{ (Issues Proj %)} + (0.3) \text{ (exam %)} + (0.2) \text{ (final exam %)} + (0.15) \text{ (Connect & Class Assmts %)}\)
# Tentative Schedule for Spring 2012 - Biology 100 - K. Marr

**Caution!** This schedule is only approximate and is subject to change at the instructor’s discretion!

<table>
<thead>
<tr>
<th>Week</th>
<th>Starting</th>
<th>Weekly Schedule (Only approximate and subject to change!)</th>
<th>Lab Activities in SC-255</th>
</tr>
</thead>
</table>
| **Week 1** | **April 2** | Intro. to course; Scientific Method, Evolution/Natural Selection, Characteristics of life | **Lab 1.**  
Heart Rate, Physical Fitness and the Scientific Method  
Sec. A on Tuesday; Sec. B on Thurs. |
| **Week 2** | **April 9** | The nature of matter, Water's Importance to Life, Acids and Bases, Organic molecules, Biological Molecules in Cells: Carbohydrates, Lipids, Proteins, Nucleic Acids | **Lab 2.**  
The Microscope & Cell Structure  
Exam 1 Take in GRCC Testing Center outside of class time either Tues. 4/24 or Thurs. 4/26/2012—your choice. Bring picture ID. |
| **Week 3** | **April 16** | Inside the cell: cell structure and function, The Dynamic cell: Energy, ATP, Metabolic pathways and Enzymes, Cell transport | **Lab 3.**  
Diffusion and Membrane Transport  
Ch 4: Inside the Cell  
Ch 5: The Dynamic Cell  
Read Issues Project handout before attending class on Monday  
Ch 7: Energy for Cells (cellular respiration)  
Read Issues Project handout before attending class on Monday  
Ch 8 Cellular Reproduction  
Ch 10 Patterns of Inheritance  
Ch 12.1 Cloning  
Ch 12.3 Cancer: Failure of Genetic Control  |
| **Week 4** | **April 23** | **Wednesday 4/25/2012 Faculty In-service: No daytime classes**  
Monday: Intro to Issues Project: Select Issues Project topic and group members; Read Issues Project handout before attending class.  
The Energy for Cells: Cellular respiration: glycolysis, citric acid cycle, electron transport chain, alternate metabolic pathways, lactic acid and alcoholic fermentation  
Exam 1 Take in GRCC Testing Center outside of class time either Tues. 4/24 or Thurs. 4/26/2012—your choice. Bring picture ID.|
| **Week 5** | **April 30** | Photosynthesis: light reactions, Calvin cycle, C₄ and CAM photosynthesis | **Lab 4.**  
Pea Lab (set up & make observations over the next few weeks)  
Work on Issues Project: Project References  
Start: Lab 7, Mendelian Genetics  
Ch 6: Energy for Life (photosynthesis)  
Ch 9 Sexual Reproduction  
Ch 10 Patterns of Inheritance  |
| **Week 6** | **May 7** | Cellular Reproduction basics, Cell cycle, Mitosis and cytokinesis, Cell cycle control, Cell cycle and cancer  
Cancer: Failure of Genetic Control, proto-oncogenes, oncogenes (e.g.), tumor suppressor genes (e.g. BRCA 1, BRCA2 & p53 genes)  
Reproductive and Therapeutic Cloning (pp. 198 – 200)  
Read Issues Project handout before attending class on Monday  
Ch 7: Energy for Cells (cellular respiration)  
Ch 8 Cellular Reproduction  
Ch 10 Patterns of Inheritance  
Ch 12.1 Cloning  
Ch 12.3 Cancer: Failure of Genetic Control  |
| **Week 7** | **May 14** | Meiosis basics, Phases of meiosis, Meiosis vs. Mitosis, Nondisjunction: Down syndrome (trisomy 21), abnormal sex chromosome number  
Start Chapter 10: Patterns of Inheritance?  
Mendel's laws, mono- and dihybrid crosses, laws of probability and Mendel's laws, Meiosis and Mendel's laws, Beyond Mendel's law: Incomplete dominance, multiple alleles (blood types), polygenic inheritance, sex-linked (X-linked) inheritance, Inheritance of linked genes  
Y-Karyotypes, Aminoicentosis, Chorionic villi sampling, Chromosomal mutations, Family pedigrees: autosomal vs. sex-linked disorders; recessive vs. dominant disorders; Testing for genetic disorders; Gene Therapy  
Exam 2: Take in GRCC Testing Center outside of class time either Tues. 5/22 or Thursday 5/24/2012—your choice. Bring picture ID.  
Ch 9 Sexual Reproduction  
Ch 10 Patterns of Inheritance  
Ch 13 Genetic Counseling  |
| **Week 8** | **May 21** | Mon. May 28, 2012 Memorial Day: Campus closed  
DNA and RNA structure and function, Gene Expression: DNA to RNA (transcription), RNA to protein (translation), genes and gene mutations; DNA Technology: recombinant DNA technology, Transgenic organisms, PCR. DNA fingerprinting  
Biologicals of Aging—Pt. 1: Stealing Time Video Series  
Ch 11 DNA Biology and Technology  
Note: the biology of aging unit will be done only if time permits!!  
Ch 6: Energy for Life (photosynthesis)  
Ch 9 Sexual Reproduction  
Ch 10 Patterns of Inheritance  
Ch 12.1 Cloning  
Ch 12.3 Cancer: Failure of Genetic Control  |
| **Week 9** | **May 28** | Biology of Aging—Pt. 2: Stealing Time Video Series  
Biology of Aging—Pt. 3: Stealing Time Video Series  
Lab 5.  
Energy Harvest—Alcoholic Fermentation by Yeast  
Exam 2: Take in GRCC Testing Center outside of class time either Tues. 5/22 or Thursday 5/24/2012—your choice. Bring picture ID.  
Lab 6.  
Mitosis and Online Karyotyping  
Bring a PC data storage device  
Lab 7.  
Mendelian Genetics  
Exam 2: Take in GRCC Testing Center outside of class time either Tues. 5/22 or Thursday 5/24/2012—your choice. Bring picture ID.  
Lab 8.  
Extracting DNA from your Cells  
Ch 7: Energy for Cells (cellular respiration)  
Ch 9 Sexual Reproduction  
Ch 10 Patterns of Inheritance  
Ch 12.1 Cloning  
Ch 12.3 Cancer: Failure of Genetic Control  |
| **Week 10** | **June 4** | Biology of Aging—Pt. 2: Stealing Time Video Series  
Biology of Aging—Pt. 3: Stealing Time Video Series  
If time permits...  
Biology of Aging: See the Online reading list on page 8 and the class webpage for links to the articles listed.  
Records Project Group Presentations  
Start: Lab 7, Mendelian Genetics (Lab 7 report due at end of lab period)  
Lab 6.  
Mitosis and Online Karyotyping  
Bring a PC data storage device  
Lab 8.  
Extracting DNA from your Cells  
Ch 7: Energy for Cells (cellular respiration)  
Ch 9 Sexual Reproduction  
Ch 10 Patterns of Inheritance  
Ch 12.1 Cloning  
Ch 12.3 Cancer: Failure of Genetic Control  |
| **Week 11** | **June 11** | Final exam week  
**Tuesday June 12 Study Day:** No daytime classes;  
1-3 p.m.: Review/Question Session in SC-240 (Attendance is optional)  
**Final Exam: Biol& 100 Sections A and B:**  
8:00 – 10:00 a.m. Wednesday 6/13/2012 in SC-240  
**Final Exam: Biol& 100 Sections A and B:**  
8:00 – 10:00 a.m. Wednesday 6/13/2012 in SC-240  
Ch 7: Energy for Cells (cellular respiration)  
Ch 9 Sexual Reproduction  
Ch 10 Patterns of Inheritance  
Ch 12.1 Cloning  
Ch 12.3 Cancer: Failure of Genetic Control  |

1 = Chapters and pages in Biology 100 textbook, *Essentials of Biology by Sylvia Mader (3rd ed)*