Issues in Biotechnology
BCH 190, AFS 190, NRS 190, MIC 190, PLS 190
Special Programs OnLine Spring 2012
Dr. Albert Kausch, Professor, Department of Cell and Molecular Biology
Kimberly Nelson, Research Associate, University of Rhode Island
Guest Lecturers-To Be Arranged (TBA)

Course Description

This course is for a broad audience covering in simple terms, basic knowledge in the exploding fields of biotechnology.

Dr. Albert Kausch, Professor, University of Rhode Island

The applications and developments in biotechnology are among the most provocative and socially relevant topics today. The course, Issues in Biotechnology, (BCH 190) is intended for a broad audience; we are interested to include various majors as well as levels. There are no prerequisites for this course. This is not a course meant to ‘weed out’ biology majors or pre-med students, but to include the many perspectives on the broad ranging topics in biotechnology today. We encourage all interested students to take this class. The course aims to accomplish three goals: 1) to provide basic knowledge about DNA, genomics and gene expression that is fundamental to the how biological life functions, 2) to present a panoramic survey of the current applications in biotechnology, and career opportunities in the growing fields that are related to biotechnology; and 3) to examine issues and ethics concerning the future of biotechnology and our society.

Education about biology and biotechnology has now become imperative regardless of background or interests…it will affect all of us. What we know now about the biological world and the sciences that study its mechanisms as well as the applications of this knowledge in biotechnology will affect all of us and shape many facets of our global society well into the future. There is not a more profound, provocative, and socially relevant topic for education currently.

How does life work? What is life? How are genes sequenced or cloned? Should we be cloning genes and moving them into other organisms? How will biotechnology affect medicine, pharmacy, and agriculture? Should we be cloning and genetically engineering animals? Should the federal government support stem cell research? What are the ethical issues? What are the career opportunities in the various fields that utilize biotech? These are currently just some of the important and socially relevant questions regarding the extraordinary advances in biotechnology that are addressed in this new course titled “The Way We Work With Life: Issues in Biotechnology”.

Knowledge about how life on this planet works should be a part of basic education and will provide a basis for informed dialogue about the current advances in all of the various and often controversial fields of biotechnology.
Course Description

The biological and environmental sciences have been rapidly transformed by the introduction of DNA-based technologies that allow for the precise manipulation and examination of the genetic material of plants, animals and microbes. The applications of these technologies encompass the rapidly growing fields within biotechnology. The tools of biotechnology are currently being applied across the biological sciences to address problems in agricultural crop improvement, marine sciences and aquaculture, medicine, pharmacy, forensics, and public health. The introduction of this field has been extremely rapid and has created a tremendous educational need to keep pace. New career opportunities are now being made that did not exist previously.

This course provides an introduction to Biotechnology and its impact on the environmental and life sciences, medicine, and agriculture. First, the basic questions concerning What is Life? and How does it work? are examined. To address these questions, the fundamental mechanics of biological life, DNA, gene expression and cloning are presented in basic layman’s terms as a basis for the current applications of modern biotechnology. Next, the current basic techniques used for gene cloning, DNA sequencing, PCR and gene transfer are examined. These technologies provide the basis for biotechnological advances in medical, pharmaceutical, agricultural, environmental, and forensic applications. Applications of recombinant DNA and genetic engineering are explored in these areas that are dramatically affecting our society and future. Lastly, the implications of biotechnology to world economy, politics, careers, ecology social concerns and ethics are also discussed.

1. Background

Today, the term ‘biotechnology’ most frequently refers to the use of DNA-based technologies that are now so widely used in medical, pharmaceutical, agricultural, environmental, and forensic applications. News and breakthroughs in biotechnology are now common in the popular press. For example, a recent special issue of TIME magazine was titled “Biotechnology-The future is now”. However, education of the public is lagging significantly behind the rate of advancement in this rapidly developing field.

The techniques to clone the first gene were developed more than forty years ago. Now it is possible to clone genes from any organism, including bacteria, fungi, plants and animals and transfer those cloned genes into other organisms. For example, a gene can be cloned from a bacteria, and moved into a plant such as corn where the plant will then make the protein that is usually made by the bacteria. The transferred DNA sequence, or transgene, directs the cell to make its specific protein product and provides the potential for new traits.

Given the rapid recent advances in genomics, transgenic biology, stem cell research and other related areas of biotechnology and a prediction that these fields will continue to grow and become increasing more sophisticated, there is an increasing need to create an
informed and educated public in this area. The fact that there are various concerns and issues regarding the various fields of biotechnology further underscores the need for increased public education and awareness.

Educational Objectives for BCH 190 and its cross listings (General Undergraduate fulfills a General Education Requirement for Science for majors and non-majors)

Specific Educational Objectives:

This course, Issues in Biotechnology (BCH 190 and its cross listings), is intended for the general public, Life Science Industry staff, high school teachers and undergraduate students regardless of their major or degree program. It also forms the basis for the graduate level versions of this course. There are no prerequisites. The course aims to accomplish three goals: 1) to provide basic knowledge about DNA and gene expression that is fundamental to the how biological life functions, 2) to present the current applications in biotechnology, and career opportunities in the growing fields that are related to biotechnology; and 3) to examine issues and ethics concerning the future of biotechnology and our society. This course provides a perspective on the rapidly changing fields of biotechnology and offers insight into careers.

This course is not meant to ‘weed out’ prospective majors, but rather provide a general understanding of the general topics important to today’s society in order to make informed decisions and opinions on these controversial topics that effect all of us. I will tell you how to get an A in this class, and I am sure that if you follow a few simple guidelines, you will get a good grade. (see RateMyProfessor.com for recommendations and comments from previous students; also, Google Dr. Albert Kausch URI for background and perspective on the professor for this course).
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Schedule of lectures, reading assignments, and quiz, exam and assignment deadlines

Registration and Login: How to Register:

Registration for this course is on a rolling enrollment basis. Choose the semester that best fits your schedule given the registration and course completion dates listed below.
Spring 2012: registration period January 1- April 8; course completion date April 30.
Summer 2012: registration period April 9- July 8; course completion date July 22.
Fall 2012: registration period July 23-Nov18; course completion date December 10.
Notice that these are rolling deadlines for your convenience. Pay attention however to the timing suggested to stay on course.

You can take the course at your own pace, but the dates indicated above must be followed in order for grades to be reported at the close of the chosen semester. This class does not have a “drop” policy which means there is no refund of fees at any time. If you cannot complete the requirements of the course, you will receive a grade of “I” incomplete and you will have one year to complete the class for a letter grade.

Billing:
Once your registration is submitted, URI will send you a bill. Registration fees are expected to be remitted completely and in a timely manner. Unpaid balances will result in university sanctions being imposed.

For the URI OnLine Student: The Course Progression-What the student needs to do to take this course on-line

- Register for the course online through the URI Special Programs website (www.uri.edu), review syllabus and course requirements
- Review the Syllabus and Course Requirements in this document

Overview of course progression
- The student will view two lectures per topic within each week as scheduled; progress is monitored.
- Study from the Powerpoint slides on that topic (all Powerpoint slides correspond to the lecture topic numbers)
Complete the reading assignment from the text (all reading assignments are specified in the Schedule of Lectures and correspond to the lecture topic numbers)
Answer all Study Guide questions (corresponding to the lecture topic numbers)
Participate in the Issues in Biotechnology Forum and email questions or comments to issuesinbiotechnology190@gmail.com
Take the quiz for that topic covered by the two specified lectures.
Go on to the next two topics in the syllabus, and so on, to complete the first third of the course (Part I: What is Life? The Mechanics of Life and General Biotechnology).
Submit initial report for the Stock Project after Lecture #6. As described, pick five biotechnology companies and invest $100,000 to issuesinbiotechnology190@gmail.com.
The Mid-term exam is comprised of previous study guide questions through lecture 12 (inclusive).
Go on to the next topic in the syllabus and so on.
Proceed through Part II: Applications in Biotechnology. As before, watch two lectures per topic, review the Powerpoint Slides and Study Guides, and take the Quizzes. And proceed through Part II.
Proceed through to Part III: Are You ready for the Future? Watch and review any two (2) of the five (5) according to your interest (All of them are great!). Review the study guide questions for these lectures. Review the Powerpoint Slides and Study Guides, and take the Quiz. Note: this quiz also covers the Forensics section. And proceed through to the Final Exam
The Final exam is comprised of previous study guide questions from lecture 15 through lecture 31 (inclusive).
Submit final report for the Stock Project to issuesinbiotechnology190@gmail.com This should be a one written page summary as described in the syllabus
Receive grade.

Note: A tracking mechanism is in place to monitor students progress. Each topic, consisting of two lectures each, should be reviewed each week and the quiz completed according to schedule.

Notes to the Students:

OnLine students follow the same schedule as indicated here in this syllabus. Please follow this schedule and these directions carefully. Your progress will be monitored closely.

Questions will occur during each lecture with multiple choice questions. To a live audience these are answered using remote control devices (called iclickers). The online student can answer these questions as well and see how their answers compare with other students. This allows student interaction with the online class community for this course. These questions involve the various topics and concepts, and can include sample test and quiz questions. A study guide of potential quiz questions is available each week. We want you to get an A in this class. If you study for an A, you might get a B, if you study
for a B you might get a C; if you study for a D, you might get a D…study for an A! For every hour of lecture video time viewed we recommend you spend three hours of study for this course. Regular logins are mandatory. A quiz times out according to the schedule and there are no make ups. Do not miss quizzes, this will profoundly affect your grade to the negative.

We will be involved with many new subjects, but also controversial topics in this class. There are two lectures back to back per weekly topic. Please stay on schedule. Some of you need to graduate on time. On the second week you will fill out a required survey about biotechnology and the life sciences. Starting on the third week there will be a quiz each week on the material present two weeks previously, covering both the lecture and text. Use the Study Guides to prepare (hint-the questions on the quizzes come directly from the study guides). Please remember to stay on schedule. The mid-term and final exam questions are also taken directly from the quizzes, i.e. there are no new questions on the exams, so if you do well on the quizzes you will probably do well on the exams). All lectures for this course will be delivered as streaming videos. Live lectures will be given on campus which you may also attend Some of these will be recorded each Weds. afternoon by Dr. Albert Kausch, or by Guest Lecturers(TBA). If interested please contact: issuesinbiotechnology190@gmail.com

Let us know if you run into any glitches or have any questions at issuesinbiotechnology190@gmail.com. Thanks!

We hope you will appreciate this course.
Schedule of lectures, reading assignments, and quiz, exam and assignment deadlines

Table of Contents Schedule and Course Instructions

Instructions: View two lectures per topic within each week as scheduled; progress is monitored. Study from the Powerpoint slides on that topic (all Powerpoint slides correspond to the lecture topic numbers) Complete the reading assignment from the text (all reading assignments are specified in the Schedule of Lectures and correspond to the lecture topic numbers). Answer all Study Guide questions (corresponding to the lecture topic numbers) Participate in the Issues in Biotechnology Forum and email questions or comments to issuesinbiotechnology190@gmail.com. Take the quiz for that topic covered by the two specified lectures.

Part 1. What is Life? The Mechanics of Life and General Biotechnology

Week 1- Login.

1. An Overview of the Course and Requirements
   Opening Lecture- Biotechnology: Panacea or Pandora’s Box
   Dr. Albert Kausch, University of Rhode Island.

2. Setting the Stage: What is Science?
   Dr. Albert Kausch, University of Rhode Island

Assignments for this week: Buy the textbook (What is Life? A Guide to Biology by Jay Phelan; 2010, Freeman Press) Confirm to issuesinbiotechnology190@gmail.com. Let us know if you run into any glitches or have any questions. Thanks! We hope you will appreciate this course.

This week Reading Assignment Chapter 1 in What is Life? Science is a collection of facts and a process for understanding the world. The quiz on lectures 1 & 2 is next week.
Review study guide questions in lectures 1 & 2.

Week 2
A. The Mechanics of DNA: What is Life?

3. Atoms, Cells and The Flow of Life
   Dr. Albert Kausch, University of Rhode Island

4. Some Techniques in Biotechnology
   Dr. Albert Kausch, University of Rhode Island

Take Quiz # 1 on lectures 1 & 2, and including Chapter 1 in the text.

Review Powerpoint slides and the study guide questions in lectures 3 & 4. Remember, the quiz for lectures 3 & 4 is next week.

This week: Reading Assignment (Chapter 2) Review for next week’s quiz.

Week 3

5. Trends, Patterns and Relationships in Biology
   Dr. Albert Kausch, University of Rhode Island

6. Some More Techniques in Biotechnology
   Dr. Albert Kausch, University of Rhode Island

Take Quiz # 2 on lectures 3 & 4, and including Chapter 2 in the text.

Review Powerpoint slides and the study guide questions in lectures 5 & 6. Remember, the quiz for lectures 5 & 6 is next week.

This week: Reading Assignment (Chapter 3) in What is Life?

Also for next week: The Biotechnology Stock Project. As explained in lecture 6, choose and submit a list of five companies, their stock market ticker symbol (for example-MON for Monsanto Corp) invest $100,000 total (fictitiously, of course) in their stocks (for example $20,000 for each company), give their price per share and total cost of shares for each company you invest in. This should take about one page (note: this project is worth 5% of your grade, you must submit this assignment this week to start the project and to receive full credit). Save a copy of this assignment, as toward the end of the semester you will review each stock and calculate your losses and gains for a final report. Additional description is found toward the end of this syllabus under Course Requirements.

Review study guide questions for the coming quiz.

This Biotech Stock Project is 10% of your grade (5% now for submission of the first part and 5% for the last report)

Week 4

7. Gene Expression and Development
   Dr. Albert Kausch, University of Rhode Island
Take Quiz # 3 on lectures 5 & 6, and including Chapter 3 in the text.

Review Powerpoint slides and the study guide questions in lectures 7 & 8. Remember, the quiz for lectures 7 & 8 is next week.

This week: Reading Assignment (Chapter 5) in What is Life? Remember to review the Powerpoints and the study guide questions.

Week 5

Evolution and The Flow of Information Why is the topic of evolution still controversial? What is a Theory? What are the facts? How does evolution happen?

9. Evolution: How Does It Happen?
Dr. Albert Kausch, University of Rhode Island

10. Evolution: Genes and Ideas
Dr. Albert Kausch, University of Rhode Island

11. What is Evolution?
Dr. Kenneth Miller, Brown University

12. Why is it Controversial?
Dr. Kenneth Miller, Brown University

See all four of these lectures. Take Quiz # 4 on lectures 7 & 8, and including Chapter 5 in the text.

Review Powerpoint slides and the study guide questions in lectures 9 - 12. Remember, the quiz for lectures 9-12 is next week.

This week: Reading Assignment (Chapter 8) in What is Life? Remember to review the Powerpoints and the study guide questions.

Part II. Applications of Biotechnology

Week 6

B. Agriculture Biotechnology: The Past Present and Future of Farming

13. How Is It Done & How It Is Used
Dr. Albert Kausch, University of Rhode Island

Dr. Albert Kausch, University of Rhode Island

Take Quiz # 5 on lectures 9-12, and including Chapter 8 in the text.

Review Powerpoint slides and the study guide questions in lectures 13 and 14. Remember, the Mid-term is next week. This is 30% of your grade...so study hard!
This week: Reading Assignment (review pgs 179-204 in Chapter 5) in What is Life?. Review study guide questions. Study for the Mid term exam. The Mid term exam will be comprised entirely from the previously asked quiz questions. Study the correct answers to those questions. The Mid-term includes everything up to and including lecture 14.

Second half of Issues in Biotechnology begins here- Everything after lecture 14 will be included on the Final exam

C. Energy and the Future of Humanity

Week 7

15. Biofuels for the Future: Renewable Resources and Independence from Foreign Oil and the Carbon Cycle  Dr. Albert Kausch, University of Rhode Island

Take Mid-term exam!!! which is comprehensive through lecture 14 (including Agricultural Biotechnology) and including all assigned readings to date. The exam is assembled largely from the quizzes up to this point. (the exam includes questions from all previous quizzes and reading assignments up to date in the text, there will be one written question-which might ask the question What is Life? To be answered in three paragraphs)

This week: Reading Assignment (TBA on Bioenergy) in Review study guide questions on lecture 15. Don't forget to study for the Quiz # 6 on lecture 15 on Biofuels

Week 8

D. Pharmaceutical Biotechnology

16. Pharmaceutical Biotechnology: Emergent Technologies
   Lecturer- TBA

17. Personalized Genomes, Pharmacogenomics & the Future: Who are We?
   Lecturer- TBA

Take Quiz # 6 on lecture 15 on Biofuels and TBA reading assignment

Review Powerpoint slides and the study guide questions in lectures 16 & 17. Remember, the quiz for lectures 16 &17 is next week.

This week: Reading Assignment (TBA on Pharmaceutical Biotechnology) Review study guide questions.

Week 9

E. Applications of Medical Biotechnology

18. Stem Cells: Therapy and Medical Research
Take Quiz # 7 on lectures 16 and 17 and TBA reading assignment

Review Powerpoint slides and the study guide questions in lectures 18, 19, 20. Remember, the quiz for lectures 18, 19 & 20 is next week.

This week: Reading Assignment TBA on Medical Biotechnology Review study guide questions.

F. Biotechnology Careers, the Economy and Education

Week 10

21. Careers in Biotechnology
   Lecturer: TBA

21. The Challenge and Role of STEM Education in the United States
   Lecturer: TBA

Take Quiz # 8 on lectures 18, 19, 20 and TBA reading assignment

Review Powerpoint slides and the study guide questions in lectures 20 & 21. Remember, the quiz for lectures 20 & 21 is next week

This week: Reading Assignment TBA Review study guide questions.

Week 11

G. Marine Biotechnology

22. The Oceans: An Untapped Source and Aquaculture for the Future
   Dr. Marta Gomez-Chiarri, University of Rhode Island
   Dr. Terrance Bradley, University of Rhode Island

23. Poseidon’s Medicine Cabinet: Finding Drugs From the Sea
   Dr. David Rowley, University of Rhode Island

Take Quiz # 9 on lectures 20 and 21 and Reading Assignments

Review Powerpoint slides and the study guide questions in lectures 22 & 23. Remember, the quiz for lectures 22 & 23 is next week.

This week: Reading Assignment TBA on Marine Issues. Review study guide questions.

Week 12
H. Forensics

23. Forensics: Trace Evidence
Amy Duheim, Rhode Island State Crime Laboratory

24. DNA-based Forensics: The Real Story
Albert Kausch, University of Rhode Island and the Connecticut State Crime Laboratory

25. The National Forensic Debate: Public Safety vs. The Right of Privacy
Albert Kausch, University of Rhode Island and the Connecticut State Crime Laboratory

Take Quiz # 10 on lectures 21, & 22 and TBA Reading Assignments

Review Powerpoint slides and the study guide questions in lectures 23-25. Remember, the quiz for lectures 23-25 is next week

This week: Reading Assignment TBA Review study guide questions.

All stock project assignments are due next week!!! You must be complete your stock project final results (calculate your losses and gains and summarize the totals on one page) which will be submitted by end of the course.

Remember: This Biotechnology Stock Project is 10% of your grade (5% in the beginning and 5% for this last report) Your Stock Project final report which is due by the end of this course, will summarize your losses and gains for each company and provide a total of losses or gains. did you make or lose money this semester on biotechnology stocks. How does this relate to the general economy? You will now need to look up the same companies you chose in the beginning of the course and determine the cost per share at that time. Calculate your losses or gains for each company and your total losses and gains. This Project will be summarized with a one page written report. This was described in lecture #6.

Part III. Perspectives on The Future

1. Are You Ready for The Future?

These lectures were part of the Honors Colloquium series Fall Semester 2011 at the University of Rhode Island (available on streaming video).

This week: Assignment TBA watch and review any two (2) of the following five (5) Review the study guide questions for these lectures.

Ray Kurzweil

Ray Kurzweil is an author, inventor and futurist. He graduated from MIT in 1970, earning degrees in Computer Science and Literature. He has been described as "the restless genius" by the Wall Street Journal, and "the ultimate thinking machine" by Forbes magazine. Inc. magazine ranked him #8 among entrepreneurs in the United States,
calling him the "rightful heir to Thomas Edison" and PBS included him as one of sixteen "revolutionaries who made America" along with other inventors of the past two centuries.

Ray Kurzweil popularized the term 'Singularity' in his 2005 book, The Singularity is Near, a New York Times best seller and a #1 book on Amazon in both science and philosophy. The Singularity, also referred to as The Technological Singularity, is a point in time that many futurists believe will mark the divide between human intelligence and artificial intelligence being the primary force in technological and scientific advancement. Kurzweil argues that this point will be reached in the mid-2040s when the intelligence of all computers on Earth exceeds that of all humans by a factor of a billion. The Singularity as envisioned by Kurzweil, Vinge and others is a point beyond which it does not make sense to try to predict the future because the world as we know it will no longer make much sense.

27. Are You Ready for The Future? Synthetic Biology: Life Redesigned
James J. Collins

James J. Collins is a William F. Warren Distinguished Professor, University Professor, Professor of Biomedical Engineering, Professor of Medicine, and Co-Director of the Center for BioDynamics at Boston University. He is also a Howard Hughes Medical Institute Investigator and a core founding faculty member of the Wyss Institute for Biologically Inspired Engineering at Harvard University. His many awards include a MacArthur "Genius Award," a National Institutes of Health Director's Pioneer Award, and a Rhodes Scholarship. He has been elected to the National Academy of Engineering, and named to the Technology Review list of top 100 young innovators and the Scientific American list of top 50 outstanding leaders in science and technology.

Forging The Future One Molecule At A Time.
Jason R. Dwyer

Jason R. Dwyer is a professor of chemistry at the University of Rhode Island where he leads a research team working at the nexus of chemistry, physics and biology. His research is driven by a fascination with the wondrous complexity of molecular function and the knowledge that a molecular-level understanding of nature can lead to practical technological advances. His work is strongly focused on developing nanofabricated tools to more deeply explore the molecular world and to turn this capability into inexpensive, high performance medical diagnostic devices.

Ed Boyden

Ed Boyden is the Benesse Career Development Professor and Associate Professor of Biological Engineering and Brain and Cognitive Sciences, at the MIT Media Lab and the MIT McGovern Institute. He leads the Synthetic Neurobiology Group, which develops tools for controlling and observing the dynamic circuits of the brain and uses these neurotechnologies to understand how cognition and emotion arise from brain network
operation, as well as to enable systematic repair of intractable brain disorders such as epilepsy, Parkinson's disease, post-traumatic stress disorder, and chronic pain. The tools his group has invented include a suite of 'optogenetic' tools that are now in use by hundreds of groups around the world for activating and silencing neurons with light.

30. Are You Ready for The Future? Ethics and Genetics
Laurie Zoloth

Laurie Zoloth is the Director of the Center for Bioethics, Science, and Society, a Professor of Medical Ethics and Humanities at Northwestern University Feinberg School of Medicine, as well as a Professor of Religion at Northwestern University Weinberg College of Arts and Sciences and the Director of Northwestern University's Brady Scholars Program in Ethics and Leadership. Zoloth is also the former President of the American Society for Bioethics and Humanities, and in 2007, she received the Society's award for service in the field. In 2000, she was awarded an Ethical Legal and Social Issues (ELSI) grant from the National Institutes of Health's National Human Genome Research Institute to investigate ethical issues related to the mapping of the human genome. Zoloth has also served on several NASA committees, including two terms with NASA's National Advisory Committee, the nation's highest civilian board for NASA.

Week 13

J. The Last Lecture

28. Biotechnology: The Future is Now
Dr. Albert Kausch, University of Rhode Island

Take Quiz # 11 on lectures 23, 24, & 25 and TBA Reading Assignments

This week: Reading Assignment TBA Review study guide questions for the Final Exam!!!.

All stock project assignments are due today!!! You must be complete your stock project final results (calculate your losses and gains and summarize the totals) will be submitted by this date the end of the course. Remember: This Biotech Stock Project is 10% of your grade (5% in the beginning and 5% for this last report) There are no late submissions accepted!!! These must be graded by final grade submission. Please check that you have submitted all quizzes, exams and stock projects (or you will receive an Incomplete (I) as a grade. Review study guide questions for the Final Exam!!!.

Remember: The Final exam is worth 30% of your grade. Work hard for this one.

The Final-term exam which is comprehensive of Parts II and III (everything since the Mid-term exam) and assembled largely from the quizzes.
We hope you have really enjoyed this course!
Course Requirements

Texts
Available from the URI book store. The iclicker remote interactive devices are available on the first class and registered to you through your student ID numbered and registration through the iclicker website. These devices are required to be turned in at the end of the course in order to receive your grade so that they can be recycled and be used next semester as well. Failure return the iclicker results in and (I) incomplete. These are supplied free of charge (saving you $31.50, courtesy of a USDA grant to Albert Kausch), and are required for participation and attendance in this course.

Course Presentations: Attendance is absolutely mandatory. We want your participation. This is a course that covers many controversial topics and we encourage your questions and discussion at the end of each lecture. We also know that if the entire class participates in the iclicker interactions that this is a benefit to the entire group...so please participate! Half a letter grade from your final grade will be deducted for any unexcused absence or missed lecture (or any part of one class). If you must be absent, you MUST notify Kimberly Nelson (kauschlaboratory@gmail.com or 401-874-9900) and provide documentation for your absence. Attendance will be determined using the iclicker technology and participation in the weekly quizzes. There will be no make up tests or exams without appropriate written permission. Missing class and quizzes will drastically affect your grade (i.e. Don’t do it!-One class in this course is actually a weeks worth of lectures.)

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Used $55.50
Resale $37.00

Quizzes (weekly) will be taken in class and graded by the following week. The quizzes cover: the assigned chapter from the class text (What is Life?) focusing on both concepts and vocabulary, and concepts from the weekly live lecture(s). These quizzes consist of 20 multiple choice questions and function as a test of general knowledge on the subject. You should plan that for each hour in class you should spend 3 hrs outside of class on these assignments; or equivalent to 9 hrs outside of class per week. Lack of attention to this outside of class time may affect your grade. There are no make-up exams or quizzes without a medical excuse. Many of the quiz questions are covered during class (pay attention). Failure to complete a quiz or an exam will result in a zero.

2 Exams will be taken at the mid-term and final and will cover both class lecture material as well as the class text or assigned TBA readings, up to that date (i.e. comprehensive). The exams are derived from the quiz questions (save your quizzes) and go over the correct answers.
Stock Project- students will be responsible for a project, due before the end of term, detailing current market analysis of several publicly traded biotechnology companies. The idea is to select five biotechnology companies and invest $100,000 (fictitiously, of course). To do this look up the company and determine their ticker symbols. Look at the cost per share that the company is currently trading at and determine the number of shares that you can purchase. You can spread your money evenly across five companies (i.e. $20,000 each) or not. For example, if a company is trading at $20/share you can purchase 1,000 shares for $20,000. You must choose your companies and shares and submit a one page summary by February 16, 2012 including the companies stock tickers, the cost per share and how many shares you purchased. All companies chosen must be biotechnology companies. This summary must be handed in by February 16, 2012; keep a copy for your final report due at the end of the course. Toward the end of the semester you should look up these same companies and determine the cost per share at that time. Calculate your losses or gains for each company and your total losses and gains. This project will be summarized with a one page written report. This will be further described in class.

For Live Course Presentations Attendance is Absolutely Mandatory. 5% of the final grade will be deducted for any unexcused absence or missed lecture (or any part of one class). If you must be absent, you MUST notify kauschlaboratory@gmail.com AND leave a voice message at 874-9900 and you must provide documentation for your absence. Attendance will be determined using the iclicker technology and participation in the weekly quizzes. There will be no make up tests or exams without appropriate written permission. Missing class and quizzes will affect your grade.

Grading

The quizzes are worth 30%
The mid term exam is worth 30%
The final term exam is worth 30%
The Stock Project is worth a total of 10%

Have a great semester!

Professor Albert Kausch

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