MBB 343/BIO 343, Fall 2008, 4 credit hours

Lecture: TTH 12:00-1:15, LSE 106

Lab sections:
M 2:00-4:50 pm, T 8:45-11:35 am, T 1:30-4:20 pm, T 6:00-8:50 pm,
W 8:45-11:35 am, W 2:00-4:50 pm
in LSE-S79 and LSE-244

Instructors

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The required textbook for the course is **B.R. Glick and J.J. Pasternak (2003)** *Molecular Biotechnology: Principles and Applications of Recombinant DNA,* third edition. Additional materials are posted on the Blackboard site http://myasucourses.asu.edu, which is accessible to students registered in the class.

Aims and Expectations

DNA (deoxyribonucleic acid) is the carrier of genetic information in each living cell, and eventually determines the potential of the cell. Recent advances in the understanding and the practical use of the ways in which the information contained in the DNA is expressed and can be specifically altered have revolutionized much of the biosciences. Applications are increasingly powerful and have given rise to the field of biotechnology. This discipline is evolving rapidly as exciting developments in this area follow each other in a rapid pace. The start of the century was marked by the announcement of the virtual completion of the important part of the human DNA sequence, years ahead of schedule, and hundreds of organisms now have a known genome sequence.

The applications of recombinant DNA technology are powerful and uses (and potential misuses) are many. However, this area is often perceived as complex and somewhat inaccessible. **This course is designed to remedy this problem, and to provide information on the development and current status of DNA technology and its wide range of impacts on society**. From this course, the student will be able to develop a balanced view of the various aspects of gene technology, ***as it affects society at many different levels*** (health care, forensics, agriculture, basic science, product development, etc.).

The aim of the course is to help you understand the material so that you can work with it and apply it. **Therefore, emphasis in quizzes and exams is on testing whether you understand the concepts and can use your knowledge**. Labs are geared to help you become proficient in some standard lab techniques, and at becoming familiar with procedures and content of

scientific reporting. "Regurgitation" of memorized material is not expected; one forgets the memorized material within weeks after having finished the course, while concepts and working knowledge stick around much longer, and are far more useful in the long run.

An important thing to stress with this course is that keeping up with the material is essential. As lectures and laboratory experiments build on what was covered earlier in the course, you can get lost quickly if materials covered before are not thoroughly understood. To help you in the process of keeping up with the material, **attendance at lectures and your assigned lab section is mandatory**. If you have a valid excuse for missing a lecture or lab, please notify Dr. Mason or Dr. Gaxiola by Email or phone beforehand, and for laboratories suggest arrangements how you can catch up that same week (e.g., by participating in another lab section that same week). Note that such one-time exceptions need to be granted beforehand. There are no make-up labs.

The lecture portion of this course consists of four modules, each of which is concluded with a quiz. Quizzes are cumulative and are designed to have you use the material you have learned, but now in a different context. A final exam is given as well, at the time shown in the Schedule of Classes. **The quizzes and the final exam will focus on your comprehensive grasp of the material rather than on factual trivia.** Quizzes and the final exam are open-book and consist of essay questions. You may bring and use any written materials that do not interfere with your neighbors, but the use of electronic devices (laptops, blackberries, etc.) is not allowed.

The laboratory portion of the course is designed for you to get practical experience in basic techniques and applications in molecular biology and genetic engineering, including DNA isolation, transformation, DNA amplification, construction of recombinant DNA, gel electrophoresis, etc. Moreover, the laboratory experience serves to aid in the understanding of the materials covered in lectures. In addition to the laboratory work, students will write laboratory reports, which constitute the main part of the alb grade.

Details of lecture and laboratory parts of the course can be found on the Blackboard web site.

This course satisfies the **General Studies Literacy and Critical Inquiry (L)** requirement. A minimum of six "L" course semester hours are required on a Program of Study. The tests and laboratory reports are writing-intensive, and will help the student to learn to organize ideas logically and coherently. For help achieving your maximum writing potential, the **Writing Center** has resources and tutors available:

(480) 965-4272; writingcenter@asu.edu; http://www.asu.edu/duas/wcenter/; UASB 140

Grading. Your final grade is determined thus:

Average score on the quizzes (Qav)	40%
Final Exam (F)	25%
Grade in the laboratory section (Lab)	35%

Over the past several years, on average the following correlation between scores and grades has existed for the MBB 343/BIO 343 course (the average grade has been about a B):

86 -100 %	A
71 - 85 %	B
56 - 70 %	C
35 - 55 %	D
< 34%	E

This does not mean that exactly the same grading scale will be used this year (it depends on how easy or how hard the quizzes and exam turn out to be), but it gives you a good indication of what to expect.

Academic Integrity Policy

All contents of our course materials, including lectures, exercises, exams, etc. are under copyright protection. You may NOT distribute, post, sell, or buy any notes, exercises, quizzes or exams without our written permission**.**

ASU and MBB/BIO 343 Policy on Academic Dishonesty: "In the 'Student Academic Integrity Policy' manual, ASU defines Plagiarism [as], 'using another's words, ideas, materials or work without properly acknowledging and documenting the source. Students are responsible for knowing the rules governing the use of another's work or materials and for acknowledging and documenting the source appropriately.' You can find this definition at: **http://www.asu.edu/studentaffairs/studentlife/judicial/academic_integrity.htm#definitions**. Academic dishonesty, including inappropriate collaboration, will not be tolerated. There are severe sanctions for cheating, plagiarizing and any other form of dishonesty."

All work presented in this class, *including lab reports*, must be your own, unless collaboration is specifically and explicitly permitted. ***If a student is found to be cheating on an Exam or Quiz, the minimum penalty will be to* FAIL THE ENTIRE COURSE, and most likely a grade of XE (failure due to academic dishonesty)**. In serious cases, your instructor can request, and has in the past, that you be expelled from the university.

If you are thinking about cheating, be aware that this is a decision that can negatively affect the course of the rest of your life! By enrolling in this course, you explicitly pledge on your honor that you will not give or receive any unapproved assistance on any quiz, exam or assignment.

Cheating, plagiarism, and academic dishonesty will not be tolerated in this course. Please be aware of the University policies that allow sanctions ranging from reduction in grade to expulsion from the University without expectation of readmission.

ASU's Student Academic Integrity Policy

http://provost.asu.edu/academicintegrity/policy

Student Code of Conduct and Sanctions

http://www.abor.asu.edu/1%5Fthe%5Fregents/policymanual/chap5/chapter_v.htm#5-303

http://www.abor.asu.edu/1%5Fthe%5Fregents/policymanual/chap5/chapter_v.htm#5-308

http://www.abor.asu.edu/1%5Fthe%5Fregents/policymanual/chap5/chapter_v.htm#5-304

We urge you to learn **how to provide appropriate citations in writing to avoid plagiarism**. Those links are on the following page:

http://clas.asu.edu/students/aiavoid

BIO/MBB 343 Laboratory
Aims and Expectations

The laboratory serves three main functions:

1. Students obtain practical experience in basic techniques and applications in molecular biology and genetic engineering, including DNA isolation, transformation, DNA amplification, construction of recombinant DNA, gel electrophoresis, bioinformatics, etc.
2. Students learn to write laboratory reports based on research data and theoretical background.
3. The laboratory experience serves to aid in the understanding of the materials covered in lectures.

Each student will write a full laboratory report for each experiment (I-III). This report typically is due the week after an experiment has been finished. As experiments in a biological laboratory usually run for several days or weeks, students will need to update and expand reports regularly (typically every other week) based on what they have done those weeks. In this way, all results and concepts have been written up before memory fades. A schedule of what is due and when is available in the lab schedule overview. Students are encouraged to use the time they are waiting in the lab (during sample incubation, etc.) to get a head start on the report update. Reports are due at the start of the laboratory time, and are corrected and graded by the following week. The week after an experiment has been finished, the full laboratory report for that experiment is due.

Each laboratory report (including report updates) will have:

1. Cover page
This page should contain your name, the experiment being reported, lab section, and an original title.

2. Introduction
The purpose of an introduction is to give the reader background information pertaining to the line of investigation followed during each experiment. It should detail general knowledge about the field of research and significant past experiments that have been carried out, and delineate the goal(s) of the current experiment.

3. Materials and Methods
This section should describe the procedures that were followed for each experiment. Because most of the Materials and Methods for this course are contained on the course website, it may be sufficient to cite these materials. It is important to appending any major procedural changes that were made during the lab.

4. Results

a) This section is reserved for presenting the data or results obtained from experiments. This may be done by summarizing observations, charting data, or preparing tables and figures. Avoid interpreting (discussing) results in this section.

b) It is not sufficient to paste a figure or table into this section. The results found in the figures and tables must be described, and the most important features highlighted.

c) Figure and Table labeling:

i. Note that Figures are numbered sequentially and have their legends at the bottom.

ii. Tables, on the other hand, always are labeled at the top, and are numbered sequentially but separately from the Figures.

iii. The reader should be able to look at figures, tables and their captions and understand what the figure or table represents without reading the text of the results. On the other hand, the reader should also be able to read the text of the results without referring to the figure or table. Each of these items supports the other, and neither is complete without the other.

5. Discussion
The Discussion is used to interpret the data presented in the Results section. The Discussion is also used to revisit and answer the questions presented in the introduction, giving a general summary of what the experiment has demonstrated. Moreover, you should briefly discuss the societal impact of the use of the technology used in the experiment. In addition, if the results did not quite come out as expected, a discussion of the potential reasons for this discrepancy is appropriate.

6. References
Cite literature references in standard format. (For example: Doe, J., and Deer, J. (2004) DNA fingerprinting of endangered elk populations. J. Wildlife Res. 75: 124-137.)

7. Page numbering
Pages should be numbered (except for the cover page), and each page should have your name in the upper right corner. Page 1 is the Introduction.

In addition to report updates (see Lab Schedule for due dates), at the beginning of each laboratory period students will also turn in the answers to prelab questions for that day. Please make sure to include your name on your answer, and number the pages.

Laboratory reports are due at the time of YOUR lab during the following periods:

Experiment I: October 19-21*

Experiment II: November 30-December 2**

Experiment III: November 23**

*The Monday lab will not meet September 7 (Labor Day), and thus will be one week late for all subsequent lab meetings and lab reports.
**The Wednesday labs will not meet November 11 (Veteran's Day) and thus will be one week late for all subsequent lab meetings and lab reports.

The grading for the laboratory section of the course is determined thus:

Lab reports I, II and III:	50%
Report updates and quizzes:	25%
Laboratory performance:	25%

Criteria used in evaluating laboratory performance are as follows:

Pre-lab questions	50%

(10% deduction per day if prelab is late, i.e. not at the beginning of the class. prelab will be worth 9 points the same day after lab)

Punctuality	10%
Precision	10%
Group work	10%
Participation	10%
Cleanup	5%
Closed-toe shoes	5%

Lab reports for the five experiments are weighted as follows:

Report I:	35%
Report II:	45%
Report III:	20%

Report update and laboratory report grades will be assigned within a week, and with this timely feedback you can monitor your progress and make necessary adjustments early in the semester, so your lab experience will be as successful as possible.