About Genetic Engineering

Dr. Rothman

Office: 08-1342
Phone: x5215
email: rhrsbi@rit.edu
Dr. Rothmans Home Page: rothman.rit.edu
GE Home Page: http://www.rit.edu/~rhrsbi/GEPages/GeneticEngineering.html

Grading Criteria

You will be graded on the basis of three types of assignments: Exams, Lab Notebooks, and Lab Reports.

- Exams will be based on both lecture and laboratory material. In Genetic Engineering, there is really no difference between lecture and lab. The exams are designed to test your understanding of laboratory procedures and your ability to integrate practical techniques into a broader theoretical background.

- Your lab notebooks will be graded on how well you document your work and keep records. I will not be evaluating the work and the interpretations.

- The lab report is the vehicle by which you will describe the work, present the experimental results, and express your interpretation of the experiment.

Grading of Lab Notebooks

Lab notebooks will be graded according to these criteria:

<table>
<thead>
<tr>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Title Page and Table of Contents complete and up to date</td>
</tr>
<tr>
<td>5</td>
<td>Title and date for each entry</td>
</tr>
<tr>
<td>20</td>
<td>Data complete and up to date</td>
</tr>
<tr>
<td>10</td>
<td>Clear statements of purpose and conclusions for each experiment</td>
</tr>
<tr>
<td>20</td>
<td>Clarity of entries</td>
</tr>
<tr>
<td>60</td>
<td>Total</td>
</tr>
</tbody>
</table>

Lab notebooks will be collected THREE TIMES, UNANNOUNCED, during LECTURE. There will be no grace period for late notebooks.
Grading of Lab Reports

Reports will be graded according to three criteria:

Data (20 points): Did you obtain the correct experimental results? This is a purely technical grade and no assumption is made about whether or not you understood the project.

Interpretation (20 points): How well did you analyze and understand each part of the project?

Writing (20 points): Did you follow the appropriate format for the paper? How good was your use of grammar and language?

Computing the Final Grade

There will be two midterm exams, each being worth 200 points. The final will serve as an additional, third midterm. It will not be comprehensive.

There will be four formal laboratory reports. The second report will contain about half of the work you do during the quarter and will be worth twice the number of points (120) as the first. The final two lab reports will be brief (40 points). In addition to laboratory reports, there will be one problem set on plasmid mapping.

<table>
<thead>
<tr>
<th>Point Breakdown</th>
<th>Final Grades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams (4)</td>
<td>800 points</td>
</tr>
<tr>
<td>Lab Reports (6)</td>
<td>340 points</td>
</tr>
<tr>
<td>Notebooks (3)</td>
<td>180 points</td>
</tr>
<tr>
<td>Homework</td>
<td>70 points</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1390 points</td>
</tr>
<tr>
<td><strong>Grade</strong></td>
<td><strong>Percent</strong></td>
</tr>
<tr>
<td>A</td>
<td>90 – 100</td>
</tr>
<tr>
<td>B</td>
<td>80 – 89</td>
</tr>
<tr>
<td>C+</td>
<td>77 - 79</td>
</tr>
<tr>
<td>C</td>
<td>70 - 76</td>
</tr>
<tr>
<td>C-</td>
<td>65 - 69</td>
</tr>
<tr>
<td>D</td>
<td>50 - 64</td>
</tr>
<tr>
<td>F</td>
<td>&lt;50</td>
</tr>
</tbody>
</table>
Lab Notebooks

Keeping accurate records is critical to the process of scientific discovery. The lab notebook is the place where you record what you have done and what you found out. In industry, the lab notebook is often vital to the patenting process, especially if there is litigation over priority. Many companies require that each day’s work be signed by the investigator and a witness, and in many cases, notebooks are periodically collected and notarized. Each company publishes its own, very stringent set of regulations for lab notebooks. In this course you will keep your notebook according to industrial standards. The rules for this course are based on those required by Eastman Kodak Company.

You are expected to have your notebooks with you at all times, whether in lab or lecture. Notebooks will be collected periodically without warning. Each notebook grade will be equivalent to one lab report.

1. Each notebook must have an accurate, up-to-date table of contents.
2. Each entry must have a title, a date, and a statement of purpose or intent.
3. Each entry must end with a conclusion and/or a statement of what must next be done.
4. Make entries at the time the work is performed. Do not write notes on scratch paper and make entries in your notebook later.
5. Make neat legible entries in blue or black ink.
6. Use the pages in consecutive order. Do not leave any blank pages, or room for data or data analysis to be added later. All entries should be chronological at the time the data or analysis is completed. You may add a note at the end of one entry referring to the page of the data or of the analysis if there is intervening material.
7. For computer-generated records, photographs, or hand-drawn graphs, tape the material into your notebook. Make reference to the printout on the page. If it is necessary to put such inserts into the notebook, mount them so that they do not cover written information.
8. If data or samples from another source are entered, be sure to indicate the source clearly, including the name of the person from which they were obtained.
9. Record all steps in sufficient detail so that any person skilled in the field can repeat the work and obtain the indicated results.
10. A protocol that is used for the first time must be written out in full. If it is a standard protocol that you use on subsequent occasions, you may simply reference the first citing, subsequently giving only modifications or experimental details (e.g. particular strains, enzymes, etc.)
11. Use only standard abbreviations.
Format for Lab Reports

Lab reports are formal typed papers that describe your experiments and interpretations. They will be written according to the format of a journal research article:

**Abstract:** A brief statement of the problem and the results. No more than a short paragraph

**Introduction:** An explanation of the problem and your plan for solving it. Do not give experimental protocols and results here. Just what you want to find out, and your basic approach to the problem. Introductions are relatively short. You do not have to spill your guts about your vast knowledge of recombinant DNA here. That will be best done on the exam.

**Methods and Materials:** Present a description of the protocols, strains, DNA’s etc. The *Methods and Materials* is like a cookbook that allows others to see exactly what your experimental conditions were. Do not give experimental design. For example, if you are talking about restriction digests, give the conditions under which you do a digest, but don’t state what DNA’s and what enzymes were used: that is experimental design, and it belongs in the *Results* section.

**Results:** You should give written descriptions of the experiments, minus the protocols (given in *Methods and Materials*), with a careful description of figures and tables. Each figure and table must be numbered and captioned. You should only give enough of your conclusions to enable the reader to proceed logically from one experiment to the next.

**Discussion:** Here you restate the problem and experiments, and provide a detailed discussion of your conclusions and recount how you arrived at them.

*A Word About Plagiarism* - Most scientific research is carried out through teamwork and the final result is a single report co-authored by all members of the team. Plagiarism therefore is not an issue. In class, however, although the work is done in pairs and usually partners work together on the preparation and analysis of the data, each student must prepare his/her own lab report. It is acceptable to format the tables and figures jointly, but the main text must be written individually.
Laboratory Cleanup

Each student is responsible for helping to keep lab clean. Regardless of how you find the lab when you come in, you must swab your workplace down with detergent before and after lab, and you must empty the pipet disposal in the sink into the glass waste disposal. You must also clean up after yourself whenever you use the balance.

In addition to your personal responsibilities, you will be assigned to a clean-up crew according to the schedule below. Responsibilities of the clean-up crew are:

- Clean lab benches in your area that your classmates may have left empty
- Empty any pipet containers that classmates did not empty
- Tidy up balance areas
- Clean BioDoc-It
- Turn off water baths
- Gather up any equipment or reagents that must be returned to instructor
- Help instructor or TA’s put away any additional apparatus or reagents

STUDENTS WILL BE CHARGED DEMERIT POINTS (10) FOR EACH INCIDENT OF NOT CLEANING HIS/HER AREA AT THE END OF LAB

IF AN INDIVIDUAL CULPRIT CANNOT BE IDENTIFIED, THE ENTIRE CLASS WILL BE CHARGED DEMERIT POINTS (10) FOR EACH INCIDENT OF THE BALANCE AREA BEING LEFT MESSY AT THE END OF LAB

Clean-up Crew assignments by seat location:

```
4 4 4 4
3 3 3 3
2 2 2 2
1 1 1 1
```

Front
Laboratory Waste Management

Autoclave Waste
1. Any items that are exposed to a bacterial culture (flasks, test tubes, centrifuge tubes, dilution blanks, etc, must be autoclaved
2. Place flasks and plastic centrifuge tubes in the tubs in the washroom
3. Place test tubes in tubs in test tube racks. Fill any empty spaces in the test tube racks
4. Do not empty tubes!
5. **Remove all tape (including autoclave tape)**
6. Do not lay tubes down in the tubs!

Chemical Waste
1. Reagents may need to be poured into the chemical waste bottles according to type as per instructor
2. Organic waste contains carbon
3. Inorganic or aqueous waste does not contain carbon
4. Inform instructor or TA when you add waste to these bottles
5. Sterile water can be disposed in the sink
6. Empty glass scintillation vials may go into the glass disposal boxes

Re-usable items
1. Pipette tip boxes and microfuge tube boxes or jars should be returned to the stockroom for refilling **Do not put these items into the autoclave bins!**
2. Sterile applicator sticks are returned to the stockroom for re-filling
3. Used applicator sticks can be put into the autoclave bins or into the glass waste boxes

Sharps
1. Syringes, needles, or other sharp objects must be deposited in the red sharps container in the rear of the lab
2. Anything that looks like a syringe (e.g. Qiagen columns) should be treated as a syringe

Gel Boxes
1. After use drain running buffer from box
2. Rinse with tap water
3. Lightly dry. **Be careful of the electrodes!**
4. Return to stockroom