Course Information:
Copy and paste current course information from Class Search/Course Catalog.

Academic Unit: Biochemistry
Department: Chemistry & Biochemistry

Subject: BCh
Number: 467
Title: Analytical Biochemistry Laboratory
Units: 3

Is this a cross-listed course? No
Is this a shared course? No
If so, list all academic units offering this course

Course description:
Quantitative analysis, separation and purification of biological molecules. Applies chemical and physical methods to the characterization of biological macromolecules.

Requested designation: Literacy and Critical Inquiry-1.
Note: a separate proposal is required for each designation requested

Eligibility:
Permanent numbered courses must have completed the university's review and approval process.
For the rules governing approval of omnibus courses, contact the General Studies Program Office at (480) 965-0739.

Area(s) proposed course will serve:
A single course may be proposed for more than one core or awareness area. A course may satisfy a core area requirement and more than one awareness area requirements concurrently, but may not satisfy requirements in two core areas simultaneously, even if approved for those areas. With departmental consent, an approved General Studies course may be counted toward both the General Studies requirement and the major program of study.

Checklists for general studies designations:
Complete and attach the appropriate checklist
- Literacy and Critical Inquiry core courses (L)
- Mathematics core courses (MA)
- Computer/statistics/quantitative applications core courses (CS)
- Humanities, Fine Arts and Design core courses (HU)
- Social and Behavioral Sciences core courses (SB)
- Natural Sciences core courses (SS/SG)
- Global Awareness courses (G)
- Historical Awareness courses (H)
- Cultural Diversity in the United States courses (C)

A complete proposal should include:
- Signed General Studies Program Course Proposal Cover Form
- Criteria Checklist for the area
- Course Syllabus
- Table of Contents from the textbook and list of required readings/books

Contact Information:
Name: Scott LeFler
Phone: 7-6487
Mail code: 1604
E-mail: slefler@asu.edu

Department Chair/Director approval: (Required)
Chair/Director name (Typed): Wilson Francisco
Date: 01/22/2014
Chair/Director (Signature): [Signature]

Rev. 1/94, 4/95, 7/98, 4/00, 1/02, 10/08, 11/11/12/11, 7/12
Arizona State University Criteria Checklist for

LITERACY AND CRITICAL INQUIRY - [L]

Rationale and Objectives

**Literacy** is here defined broadly as communicative competence in written and oral discourse. **Critical inquiry** involves the gathering, interpretation, and evaluation of evidence. Any field of university study may require unique critical skills which have little to do with language in the usual sense (words), but the analysis of spoken and written evidence pervades university study and everyday life. Thus, the General Studies requirements assume that all undergraduates should develop the ability to reason critically and communicate using the medium of language.

The requirement in Literacy and Critical Inquiry presumes, first, that training in literacy and critical inquiry must be sustained beyond traditional First Year English in order to create a habitual skill in every student; and, second, that the skills become more expert, as well as more secure, as the student learns challenging subject matter. Thus, the Literacy and Critical Inquiry requirement stipulates two courses beyond First Year English.

Most lower-level [L] courses are devoted primarily to the further development of critical skills in reading, writing, listening, speaking, or analysis of discourse. Upper-division [L] courses generally are courses in a particular discipline into which writing and critical thinking have been fully integrated as means of learning the content and, in most cases, demonstrating that it has been learned.

Students must complete six credit hours from courses designated as [L], at least three credit hours of which must be chosen from approved upper-division courses, preferably in their major. Students must have completed ENG 101, 107, or 105 to take an [L] course.

Notes:

1. ENG 101, 107 or ENG 105 must be prerequisites
2. Honors theses, XXX 493 meet [L] requirements
3. The list of criteria that must be satisfied for designation as a Literacy and Critical Inquiry [L] course is presented on the following page. This list will help you determine whether the current version of your course meets all of these requirements. If you decide to apply, please attach a current syllabus, handouts, or other documentation that will provide sufficient information for the General Studies Council to make an informed decision regarding the status of your proposal.
Proposer: Please complete the following section and attach appropriate documentation.

### ASU - [L] CRITERIA

**TO QUALIFY FOR [L] DESIGNATION, THE COURSE DESIGN MUST PLACE A MAJOR EMPHASIS ON COMPLETING CRITICAL DISCOURSE -- AS EVIDENCED BY THE FOLLOWING CRITERIA:**

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>Identify Documentation Submitted</th>
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</thead>
<tbody>
<tr>
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**CRITERION 1:**
At least 50 percent of the grade in the course should depend upon writing, including prepared essays, speeches, or in-class essay examinations. Group projects are acceptable only if each student gathers, interprets, and evaluates evidence, and prepares a summary report.

<p>| | |</p>
<table>
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</table>

1. Please describe the assignments that are considered in the computation of course grades -- and indicate the proportion of the final grade that is determined by each assignment.

2. **Also:**

   Please circle, underline, or otherwise mark the information presented in the most recent course syllabus (or other material you have submitted) that verifies this description of the grading process -- and label this information "C-1".

**CRITERION 2:**
The composition tasks involve the gathering, interpretation, and evaluation of evidence

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1. Please describe the way(s) in which this criterion is addressed in the course design.

2. **Also:**

   Please circle, underline, or otherwise mark the information presented in the most recent course syllabus (or other material you have submitted) that verifies this description of the grading process -- and label this information "C-2".

**CRITERION 3:**
The syllabus should include a minimum of two substantial writing or speaking tasks, other than or in addition to in-class essay exams.

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</table>

1. Please provide relatively detailed descriptions of two or more substantial writing or speaking tasks that are included in the course requirements.

2. **Also:**

   Please circle, underline, or otherwise mark the information presented in the most recent course syllabus (or other material you have submitted) that verifies this description of the grading process -- and label this information "C-3".
<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>ASU - [L] CRITERIA</th>
<th>Identify Documentation Submitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>☒</td>
<td></td>
<td>CRITERION 4: These substantial writing or speaking assignments should be arranged so that the students will get timely feedback from the instructor on each assignment in time to help them do better on subsequent assignments. Intervention at earlier stages in the writing process is especially welcomed</td>
<td>Syllabus</td>
</tr>
</tbody>
</table>

1. Please describe the sequence of course assignments--and the nature of the feedback the current (or most recent) course instructor provides to help students do better on subsequent assignments.

2. Also: Please circle, underline, or otherwise mark the information presented in the most recent course syllabus (or other material you have submitted) that verifies this description of the grading process--and label this information "C-4".
Explain in detail which student activities correspond to the specific designation criteria. Please use the following organizer to explain how the criteria are being met.

<table>
<thead>
<tr>
<th>Criteria (from checksheet)</th>
<th>How course meets spirit (contextualize specific examples in next column)</th>
<th>Please provide detailed evidence of how course meets criteria (i.e., where in syllabus)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 and 3</td>
<td>There are 1350 points possible in the course with 1100 (81%) of those points derived from six written lab reports</td>
<td>See page 2 of the syllabus, marked C-1 and C-3</td>
</tr>
<tr>
<td>2</td>
<td>Lab reports are written in a style very similar in format to typical articles from a scientific journal. The Introduction section relates the students' work to previously published material. The Materials and Methods section describes the procedure used to gather evidence. The Results section translates the raw data into a meaningful interpretation, putting the data into the context of previously published material. The Discussion section requires the student to critically think about the results and the validity of the information that they are presenting.</td>
<td>See page 3 of syllabus and the entire page titled Lab Reports for BCH 467, both marked C-2</td>
</tr>
<tr>
<td>4</td>
<td>For the first 4 of 6 lab reports, all reports are returned within one week of submission, allowing time for students to see grading comments prior to submission of the next report.</td>
<td>See page 3 of the syllabus, marked C-4</td>
</tr>
</tbody>
</table>
BCH 467 - Analytical Biochemistry Laboratory  

Course description: Quantitative analysis, separation and purification of biological molecules. Applies chemical and physical methods to the characterization of biological macromolecules.

Enrollment requirements: Pre/Co-requisite: BCH 462 with C or better if completed

Units: 3
Repeatable for credit: No
General Studies: L
Offered by: College of Liberal Arts and Sciences

Class meeting details

<table>
<thead>
<tr>
<th>Class #:</th>
<th>Days</th>
<th>Start:</th>
<th>End:</th>
<th>Location:</th>
<th>Instructor:</th>
<th>Seats open:</th>
</tr>
</thead>
<tbody>
<tr>
<td>19414</td>
<td>W</td>
<td>7:30 AM</td>
<td>8:26 AM</td>
<td>Tempe - PSH152</td>
<td>Letter</td>
<td>5 of 175</td>
</tr>
</tbody>
</table>

Additional class details

Component: Recitation  
Session: Session C  
Required components: Recitation, Laboratory  
Dates: 1/13/2014 - 5/2/2014  
Last day to enroll: January 19, 2014  
Drop deadline: January 19, 2014  
Course withdrawal deadline: April 06, 2014  
Instruction Mode: In-Person  
Fees: $100 class fee

Books:  
View books for this class
Instructor: Dr. Scott R. Lefler

Phone: 727-8282 Office Hours in PSH-237: see Blackboard Contacts
Email: slefler@asu.edu Also available by appointment. Please email or call with
Include BCH 467 the specific day and time you would like to meet.
in the subject line!

Location: Recitations will be online, labs in PSH-431 or PSH-430.

| Lab section | Teaching Assistant    | email                           |
|-------------|-----------------------|---------------------------------
| Mon 1:00    | Dayna Peterson        | Dayna.S.Peterson@asu.edu        |
| Tues 8:00   | Jason Maxwell         | jdmalex1@asu.edu                |
| Tues 11:00  | Jesse Coe             | jdcoe@asu.edu                   |
| Tues 1:00   | Andrew Serban         | ajserban@asu.edu                |
| Wed 12:00   | Wei Feng              | wfeng13@asu.edu                 |
| Wed 2:30    | Nicholas Sisco        | nicksisco@asu.edu               |
| Thurs 8:00  | Pankti Shah           | phshah8@asu.edu                 |
| Thurs 12:00 | Andrey Kanygin        | akanygin@asu.edu                |
| Thurs 2:30  | Eduardo Espiritu      | eespiri1@asu.edu                |
| Fri 8:00    | Anshu Sharma          | asharm66@asu.edu                |
| Fri 11:30   | Jacob Hilton          | Jacob.K.Hilton@asu.edu          |


Required for lab each day: Lab notebook (a bound composition notebook is fine) with numbered pages, a USB drive, a fine-tip permanent marker pen, safety goggles and lab coat. The computers in lab are not connected to the internet so the USB drive is absolutely required on days where data is collected on the computer. For that reason, it is best to bring a USB drive every day.

Course Description: This is a biochemistry laboratory course designed to introduce the student to basic techniques commonly used in protein and DNA work. Emphasis is placed on DNA manipulations and protein expression, purification and analysis. A schedule of labs can be found on the last page of the syllabus.

Course website: Lab protocols and other important information will be available on myASU/blackboard. Please make sure that your email address is updated in the event that messages are sent from the site. **You must print a copy of the lab protocol for use during lab. It is recommended that you read over the protocol prior to lab.**
Cell phone and computer use: During lab, cell phones or other communication devices may not be used, must be silenced and must be kept in your carry-on luggage. Such devices may only be used in the event of an emergency. Please notify your TA if an emergent condition arises that requires the use of a cell phone. Use of cell phones may result in confiscation by the TA with return at the end of the lab period. During lab, computers may be used only when you have time that is not spent performing the lab. Please respect the other members of your lab and refrain from playing music and/or videos during lab. Inappropriate use of cell phones or computers will negatively impact your evaluation.

Lab safety and cleanliness: No open-toe shoes! Goggles must be worn at all times! No eating or drinking in the lab. Since some labs are long, you may step outside the lab if you need to eat or drink. You are responsible for the cleanliness of your lab space. If you spill any chemicals, clean it up immediately. Each day when you leave lab, your lab space should be cleaner than it was at the start of lab. Before you leave lab, you must check with your TA to see if any items need to be cleaned in lab. Lab cleanliness is a communal effort and does count towards your final evaluation.

Lab organization: Students will work in pairs. You must work together throughout the entire procedure, so that every student is involved in every aspect of the project. Each student will take notes directly into a bound lab notebook. These notes will include a step-by-step description of the experiment, any observations, and experimental results. Though the work is carried out in pairs, each student will record the results individually in his or her own notebook during the lab period. Your TA may check your notebook at any time so make sure it is current!

Pipettes: You and your lab partner will be issued one set of three adjustable volume micropipettes for use during lab. You are responsible for calibrating all 3 pipettes at the beginning and end of each lab period. You must keep track of the calibration from one lab period to the next. If you notice a discrepancy that is greater than 2.5% of the volume being delivered, you must notify your TA so that the pipette can be serviced.

Grade: Six lab reports will constitute 1100 points—see schedule for point values of each report. The remaining 150 points will come from a combination of quizzes and an evaluation by your TA. The evaluation will incorporate items including lab preparation and organization, lab notebook keeping, lab cleanliness and general attitude.

Grades will be assigned as follows:
A: 90%  B: 80%  C: 70%  D: 60%

I reserve the right to change the requirements for each letter grade depending upon the class performance. I will not raise the required percentages. It is your responsibility to keep track of how many points you have to dispute any discrepancies. Grades are rounded to the nearest tenth of a percent. The +/- system will be used for borderline grades only.

Attendance: Attendance of all labs is mandatory. Your TA cannot give you permission to miss any part of a lab. If you miss a lab, you will fail the course unless you have the instructor’s permission. If you miss two or more labs for any reason, you will fail the course. If you are tardy, you will miss that lab. If you leave during the lab for more than 10 minutes, you will miss that lab. If you know that you will need to miss a lab due to an interview or other instructor-approved function, it is your responsibility to attend another section of lab. You must contact the TA for the section that you will attend and notify your TA that you will be absent.
Lab Reports: Lab reports are a written summary of the work performed during lab combined with a critical analysis and discussion of the results. The format for lab reports is similar to scientific journal articles with a major emphasis upon organization and proper presentation of the results and interpretations.

Lab reports will be written individually by each student. We have a zero tolerance policy for plagiarism. If you have the slightest doubt about whether or not something you are doing might constitute plagiarism, error on the side of caution and don’t do it! You may discuss the materials, methods, results, and conclusions with your partner, but you may not copy any part of your partner’s lab report, nor the report of any other individual in the lab, this semester or prior semesters. You may use sources such as textbooks, scientific journals, websites or other items for information to prepare your lab reports. However, you must paraphrase material and write in your own words. You are not to copy verbatim from any source—this includes the lab reports of others in the class. You must cite any source from which you gather information. Failure to do so will result in significant point deductions. Any problems adhering to any of these policies will be dealt with as set forth in the ASU Student Academic Integrity Policy (available online at http://provost.asu.edu/academicintegrity). A first infraction will result in a score of zero on the report with an automatic lowering of one letter grade for your final grade. This means that even if you have enough points for an A, you will receive a maximum grade of B. A second infraction will result in the grade of XE (failure due to academic dishonesty) for the course. The similarity score on SafeAssign will be a major factor in determining plagiarism as well as other factors. If a TA feels that a report contains plagiarized material, he or she will consult with the instructor prior to taking action. You may appeal the action by requesting a meeting with both your TA and the instructor.

Reports are due on the date indicated in the schedule, at the beginning of your lab section. A hard copy of your report must be turned in at the beginning of your lab period or they will be considered late. There will be a late penalty of 10% per school day. Weekends are free. Late reports will be accepted up to 4 school days late, and must be turned in directly to your TA or instructor. If either is unavailable, you may turn it in to the Chemistry department office (make sure that the secretary time stamps your report). Reports must be turned in by the start time of your lab to count for that day. All reports must be turned in to get a passing grade in the course. You must turn in reports even if they will receive no credit.

Primary consideration for grading of the reports will be organization, clarity of presentation, and understanding of principles, though sloppy technique will be penalized to some extent. If the experiment didn’t work as expected, it will be essential to make an effort to determine the cause, and troubleshooting should be described in the report. Some experiments build upon each other, and only one report will be required for two or three consecutive weeks. These reports will contribute more heavily towards your grade. See the handout regarding lab reports (available on Blackboard) for a complete description of what is involved in each report as well as tips for writing lab reports. General writing help for your lab reports is available from the ASU Writing Center, studentsuccess.asu.edu/home/writingcenters. The first four lab reports will be graded and returned prior to the due dates for subsequent reports. You will be provided with comments that will allow you to improve future reports.

Electronic copy of lab reports: In addition to the print copy that is given to your TA, you must submit an electronic copy to SafeAssign, available through Blackboard. Failure to do so will result in a complete loss of report points for that lab. The electronic copy must be an exact copy of what you turn in to your TA and must be received within 24 hours of turning in the paper copy.
If you fail to submit all six lab reports to SafeAssign on time, you will not receive a passing grade in the course. We will not reopen SafeAssign assignments, this is your only warning.

Email contact: I welcome email contact; however, please keep the following items in mind. Please use email only if the expected response is brief. If the topic in question requires a discussion, please see me in person or call. I will not answer questions that can be clearly answered by consulting the syllabus. When emailing me, keep in mind that I have other courses so you must include BCH 467 in the subject line. Finally, correct spelling, capitalization and punctuation is required. If I cannot understand your email, I will not be able to respond.

Syllabus contract: You must sign the syllabus contract stating that you have read the syllabus and agree to the conditions set forth in the syllabus. The syllabus contract must be submitted to your TA no later than the second lab period.

Course Withdrawal: Please discuss any plans to withdraw from the course with me. I would rather work with you (such as granting an incomplete if warranted) than to require you to repeat the course. Requests for a grade of incomplete must be made during the semester as I will not change grades after the completion of the semester.
# Lab Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Lab #</th>
<th>Title</th>
<th>Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 13-17</td>
<td></td>
<td>Introduction (Monday lab)</td>
<td>None</td>
</tr>
<tr>
<td>Jan 20-24</td>
<td></td>
<td>Introduction (all other labs)</td>
<td>None</td>
</tr>
<tr>
<td>Jan 27-31</td>
<td>1</td>
<td>Restriction Mapping</td>
<td>1</td>
</tr>
<tr>
<td>Feb 3-7</td>
<td>2</td>
<td>PCR and DNA Sequencing</td>
<td>2</td>
</tr>
<tr>
<td>Feb 10-14</td>
<td>3</td>
<td>DNA Restriction and Ligation</td>
<td></td>
</tr>
<tr>
<td>Feb 17-21</td>
<td>4</td>
<td>Transformation &amp; Expression in Liquid Culture</td>
<td>3</td>
</tr>
<tr>
<td>Feb 24-28</td>
<td>5</td>
<td>Expression on Solid Media</td>
<td></td>
</tr>
<tr>
<td>Mar 3-7</td>
<td>6</td>
<td>Protein Affinity Purification</td>
<td></td>
</tr>
<tr>
<td>Mar 10-14</td>
<td></td>
<td>Spring Break</td>
<td>4</td>
</tr>
<tr>
<td>Mar 17-21</td>
<td>7</td>
<td>His tag Cleavage &amp; DEAE Chromatography</td>
<td></td>
</tr>
<tr>
<td>Mar 24-28</td>
<td>8</td>
<td>SDS-PAGE</td>
<td></td>
</tr>
<tr>
<td>Mar 31 - Apr 4</td>
<td>9</td>
<td>Protein Assays</td>
<td>5</td>
</tr>
<tr>
<td>Apr 7-11</td>
<td>10</td>
<td>Chromophore Optical Properties and pKa</td>
<td></td>
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<tr>
<td>Apr 14-18</td>
<td>11</td>
<td>Enzyme Kinetics</td>
<td>6</td>
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</table>

## Lab report information:

<table>
<thead>
<tr>
<th>Report #</th>
<th>Due Date</th>
<th>Page limit</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Feb 3-7</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Feb 17-21</td>
<td>13</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Mar 3-7</td>
<td>17</td>
<td>300</td>
</tr>
<tr>
<td>4</td>
<td>Mar 31 - Apr 4</td>
<td>23</td>
<td>300</td>
</tr>
<tr>
<td>5</td>
<td>Apr 14-18</td>
<td>13</td>
<td>200</td>
</tr>
<tr>
<td>6</td>
<td>Apr 21-25</td>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

All lab reports are due at the start of your lab period. If your report is submitted more than 5 minutes after the start of lab, it will be considered 1 day late.
Lab Reports for BCH467

Lab reports must be typed with page numbers including page count (e.g. 3 of 15). Any equations and math should be typed using a program such as MathType or Microsoft Equation Editor. Figures must be scanned and pasted directly into the text. They should be numbered, clearly labeled and must be referenced in the text. You must adhere to the page limits—any text beyond the page limit will not be read. **LAB REPORTS MUST BE TYPED IN 12 POINT FONT AND DOUBLE SPACED!**

Sections of the Lab Report:

Title (you do not need a title page)

Abstract (10%)

1. Brief project description
2. Most important results and conclusions

Introduction (25%)

1. Objective or purpose of the experiment (what are the goals?)
2. Brief discussion of theory behind the experiments and techniques
3. Any chemical or biochemical reactions
4. Any equations used for analysis of data

Materials and Methods (15%)

1. A narrative of what you did in the lab. In order to write this section, you need to read a journal article (Journal of Biological Chemistry is a great example).
2. Should include all reagents and instruments used in the experiment.
3. Should enable the reader to repeat your experiment and arrive at similar results
4. Should be clear and concise
5. **DO NOT INCLUDE A LIST OR TABLE OF MATERIALS!**

Results (20%)

1. An opening statement to describe the general results obtained
2. Raw data (tables, graphs, photos of gels, etc.) in an organized manner and clearly labeled—figures must be scanned and pasted directly into the text
3. Graphs must be generated with a program such as Excel or Sigma Plot
4. Calculations (refer back to equations mentioned in introduction)
5. Factual description of results
6. Figures and tables must have a title and description

Discussion (30%)

1. Significance of results
2. Discussion of unexpected results, problems encountered, failure of experiment
3. Interpretations supported by data
4. Limitations of data
5. Suggestions for improvement
6. Questions from text

References (may be single spaced)

1. Citations from text
2. Other literature

While there is no grade for this section, lack of references will impact the introduction section.
Some general guidelines for lab reports:

1. Italics, symbols ($\mu$) and sub/superscripts need to be used when appropriate.
2. Don’t refer to each week’s experiment as a separate week. Think of the lab as one big study and present it in a logical manner (not necessarily based upon the order in which you performed the experiments).
3. When using an abbreviation, write out completely one time, then include the abbreviation in parentheses immediately after. After that, you may use the abbreviation.
4. Avoid excessive use of capitalization. Most science related words (such as polymerase chain reaction, affinity chromatography, imidazole, etc…) are not capitalized.
5. When reporting standard deviation, it should be done in a manner similar to the following: 0.567 $\pm$ 0.023 mg/ml (note that the units come after the error)
6. The pronouns “I” or “We” are not used! The verb tense is always the same. In science, the passive voice is used, especially in the materials and methods section. If you are not sure whether or not you are writing in the passive voice, use the zombie test. You should be able to add the phrase “…by zombies.” to the end of any sentence. As an example of something that passes the zombie test: 10 $\mu$l of buffer was added to each of the reaction tubes (by zombies). This would not pass the zombie test: I added 10$\mu$l of buffer to each reaction tube (by zombies). Use the zombie test and you should never lose points for failing to use the passive voice.
7. Each sentence should express a single thought and be complete without being a run-on sentence or having other ghastly grammatical errors.
8. Each paragraph should cover one topic. If you are putting multiple topics into the same paragraph and that paragraph becomes rather lengthy, you should start a new one.
9. All figures are to be included in the appropriate section. Appendices are not allowed and will be disregarded by your TA.

Submission of files via email:

1. The file that you send must be identical to the paper copy that you give to your TA.
2. All figures, graphs, tables, etc… that are found in your paper report must be included in the file that you send. Make certain that you compress any picture files to keep the file small.
3. You must use a program such as Excel or Sigma Plot to make any graphs. Graphs must be pasted directly into the file. Scans of hand-drawn plots are not acceptable.
4. You must use a drawing program (MS Word has a drawing function) to make items such as a plasmid map. This must also be pasted directly into your file.
5. The typical size for files is 1 MB or less. If your file is larger, you probably need to compress any scans. A program such as Microsoft Office Picture Manager or JPEGCompress are great programs to compress jpeg files.
6. The filename that you send is to be “lab#-your name” where the # corresponds to the lab report number (1-6) and your name (first name then last name) appears where it should. Note that there are no spaces except between first and last name. If you do not send a file with the correct name, your email will be returned and you will need to re-send it with the correct name. As an example, if I was submitting the third lab report, the filename would be titled lab3-scott lefler.
7. The electronic copy must be received within 24 hours of submitting your paper copy.
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PREFACE xv

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List of required readings

From Ninfa and Ballou, *Fundamental Laboratory Approaches for Biochemistry and Biotechnology*:
Chapter 2-8, 10-11, 13-14

From *Lehninger's Principles of Biochemistry, 5th edition* (this is the required textbook used in the corequisite course, BCH 462):
Chapters 6.3, 9

From *Methods in Enzymology*:
Volume 152, pages 61-87 and 113-129
Volume 155, pages 335-350
Volume 204, pages 63-113
Volume 218, pages 104-121 and 154-172

In addition to the list of readings, I have worked with the chemistry librarian (previously Olivia Sparks, now Linda Shackle) to develop two separate tutorials for evaluation of information sources. This has helped students choose quality information sources as background material for writing their lab reports. Since first implementing this tutorial, we have seen a dramatic drop in the use of random websites as information sources, replaced largely by peer-reviewed literature or textbook sources.