Laboratory in Genetics and Cell Biology, Semester I, 2019

Discussion 602
Instructor: Dr. Julie Oliver
Thursday, 2:00 – 2:50, Lapham 253

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<tr>
<th>Section</th>
<th>Meeting Time</th>
<th>Location</th>
<th>Teaching Assistant</th>
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<tr>
<td>Lab 803</td>
<td>Th 3:00 – 5:50</td>
<td>Lapham 466</td>
<td>Vidhya Basak</td>
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<tr>
<td>Lab 804</td>
<td>Th 3:00 – 5:50</td>
<td>Lapham 468</td>
<td>Cammy Truong</td>
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Contact Information:

Dr. Julie Oliver
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Office Hours: Tu, Th 11:00 – 12:00 or by appointment

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Cammy Truong
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Office Hours: Tu, Th 10:00-11:00 or by appointment

Description:
Laboratory studies in genetics and cell biology using microorganisms, plants, and animals. Hypothesis testing, data collection, computer and literature analyses, and writing of scientific papers.

Prerequisites:
BioSci 152 and Chem 104, plus BioSci 315 (Cell Biology) or BioSci 325 (Genetics), or concurrent registration in 315 or 325. Note that the stated prerequisite courses also require completion of BioSci 150 and Chem 102.

Required Materials:
The exercises that constitute the required laboratory manual are available on-line at the course Canvas site. As supplemental information for this class and subsequent lab courses, Current Protocols Essential Laboratory Techniques (First or Second Edition, Gallagher & Wiley, eds., Wiley-Blackwell) is highly recommended. In addition, a Cell Biology textbook will be invaluable (Alberts, et al., Essential Cell Biology, Third or Fourth Edition, Garland Science; or Alberts, et al., Molecular Biology of the Cell, Fifth or Sixth Edition, Garland Science).

Expectations:
This 2-credit course meets for 1 hour of discussion and 3 hours of lab per week during the semester. Students are expected to put in a minimum of 2 hours per week outside of class preparing, working on assignments, and studying to achieve the learning goals of this course. Most successful students spend more than the minimum amount of time expected studying, completing problem sets, and writing lab reports.
Grading:

- 3 Exams, 20 points each = 60 points
- 2 Lab Reports, 35 points each = 70 points
- Homework Assignments, points may vary = 60 points
- Participation = 5 points
- Technique = 5 points

TOTAL: 200 points

Grading Criteria:

Final grades will be awarded on the basis of A = 100-90%, B = 89-80%, C = 79-70%, and D = 69-60%. Pluses and minuses will be awarded as deemed appropriate. A score of less than 60% of the total available points will constitute a failing grade.

Exams will be primarily short answer format, with a clear emphasis on performing calculations.

The format of lab reports will be discussed in class. A minimum of an outline of your lab report must be turned in on the date in which a draft is due. Additionally, if you wish to have staff review your lab report prior to submission, there will be class time available on the draft due date. To receive the same points on the second report as on the first, significant improvement will need to be demonstrated. In other words, you must take the comments from your first report and use them to make your second report better! Receipt of both a hard copy of your lab report and an electronic version (Word document, deposited in the Canvas drop box) by the beginning of discussion on the due date are required for your report to be considered “on time.” Acceptance of late lab reports is entirely at the discretion of the instructor. If the instructor chooses to accept a late lab report, significant points will be deducted from it.

Homework assignments will include completing the questions about the experiment included in your lab manual, as well as filling in all data, tables, and graphs. Assignments are due at the beginning of discussion in the week that is indicated on the schedule.

Each week’s experiment requires preparation before class. For protocols that require calculations to be made prior to lab, the TAs will review and score that portion of document before you begin work. The results will impact your grade on either the problem set or the lab report associated with the unit! There will also be a minimum of two pop quizzes during the semester that will assess your preparation for the lab. As for the calculations, your performance on the quizzes will impact your grade on either the problem set or the lab report associated with the unit. Therefore, ADEQUATE PREPARATION BEFORE LAB IS AN ABSOLUTE REQUIREMENT FOR THIS COURSE.

Participation and Technique points will be awarded based on: on-time attendance, contribution to class discussions, positive interactions with other students, preparation for lab prior to class time, and attention to detail during the lab exercises.
**PowerPoint Presentations:**
The slides used to introduce each week’s topic will be available on the course Canvas site. It is highly recommended that you print them before discussion/lab and use the pages to take notes (3 slides per page is recommended). **Any information that is presented in discussion or lab is fair game for exams, even if it is not available on Canvas.** Unless otherwise announced in class, PowerPoint presentations should be available no later than Monday of each week.

**Rules and Regulations:**
**Attendance in the discussion and laboratory is mandatory.** Advance notification is required for an absence to be excused. Unexcused absences cannot be made up. Exams cannot be made up without a valid written excuse. The time of any makeup exams or other assignments is at the instructor’s/TA’s discretion (although allowances will be made for conflicts with final exam dates in other classes). Students may not attend other lab sections without permission of the instructor and TA. **Points will be deducted for missing either discussion or lab, arriving late, departing early, or taking breaks without explicit permission from the instructor.** If you require accommodation for religious observances, please let your instructor know as soon as possible in order to schedule a makeup or alternative exercise.

The highest standards of academic conduct are expected in this course. We have a database of lab reports submitted in previous semesters to which we compare current submissions. In addition, we routinely compare the text in lab reports to information that can be accessed on the internet. The UWM website (http://www4.uwm.edu/libraries/help/faq/plagiarism.cfm) defines plagiarism as the following:

“Plagiarism is presenting another person's words or ideas as your own. In academic writing, any time you use a work's information or ideas, credit must be given to your source. The only exception to this rule is that commonly known facts do not require attribution. Plagiarism includes not only the presentation of other's original ideas as your own, but the act of weakly paraphrasing another's writing style and passing it off as your own prose. **Plagiarism is a serious instance of misconduct. Several professional careers have been ruined by the discovery of an act of plagiarism.** As a general rule and whenever in doubt, it is always better to include a citation rather than risk the appearance of plagiarism. Please see the UWM Libraries guide ‘Avoiding Plagiarism’ for more information.”

Note that wording copied directly from other sources and presented as your own, even when properly referenced, is defined as plagiarism and considered to be misconduct. Academic misconduct may result in expulsion from the University. Links to University policies and procedures regarding academic conduct can be found at:


**The schedule of laboratories and exercises is as follows:** (Schedule is subject to change! You may be provided an addendum to this syllabus that will supersede this version.)
(An alternate syllabus is available with information for CP 1st edition and ECB 3rd edition)

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<th>Week</th>
<th>Dates</th>
<th>Topics</th>
<th>Materials Due</th>
<th>Suggested Reading</th>
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| 1    | Sept. 03 (Tu), **05 (Th)** | Introduction AND Dilutions                  | N/A           | **CP**: xxiii-xxxiii; 1.1.1-1.2.11; 3.1.1-3.3.12 (esp. 3.1.1-3.1.14); 4.2.8-4.2.11  
**ECB**: pp. 26-36 |
| 2    | Sept. 10 (Tu), **12 (Th)** | Spectrophotometry AND Graphing              | “Dilutions” problem set (10 points) | **CP**: 2.1.1-2.1.28; 2.2.1-2.2.39 (esp. 2.2.16-2.2.19)  
**ECB**: pp. 26-36 |
| 3    | Sept. 17 (Tu), **19 (Th)** | Determination of Protein Concentration AND Standard Curves AND Graphing | “Spectrophotometry” problem set (10 points) AND BONUS #1 | **CP**: 2.2.1-2.2.39 (esp. 2.2.3-2.2.10; 2.2.12-2.2.13; 2.2.25-2.2.34); 2.1.15-2.1.28  
**ECB**: pp. 26-36 |
| 4    | Sept. 24 (Tu), **26 (Th)** | Microscopy AND Cell Counting                | “Protein Concentration” problem set (10 points) | **CP**: 9.1.1-9.1.30 (esp. 9.1.24-9.1.27); 4.2.6-4.2.11 (& 4.1.1-4.1.12)  
**ECB**: pp. 5-12  
**Canvas**: Current Protocols Unit 4.3 (esp. 4.3.17-4.3.26) |
| 5    | Oct. 01 (Tu), **03 (Th)** | Actin Cytoskeleton, Preparation of Cell Lysates | “Microscopy and Cell Counting” problem set (10 points) | **CP**: 4.1.1-4.1.12; (also 9.2.10-9.2.23)  
**ECB**: 157-168; 372-373; Ch. 17 (esp.583-592); 691-692  
**Canvas**: Phenylmethanesulfonyl fluoride MSDS |
| 6    | Oct. 08 (Tu), **10 (Th)** | SDS-PAGE                                    | EXAM 1 (20 points) (Weeks 1 - 4) | **CP**: 7.1.1-7.1.7; 7.3.1-7.4.14  
**ECB**: p. 167 |
| 7    | Oct. 15 (Tu), **17 (Th)** | Analysis of SDS-PAGE AND Yeast Mutagenesis | Protein Results (from Week 3, “Protein Concentration”) | **CP**: 7.3.18-7.3.26; 7.2.2  
**ECB**: pp. 667-679  
**Canvas**: Ethidium bromide MSDS |
| 8    | Oct. 22 (Tu), **24 (Th)** | Isolation of Petite Mutants                 | Lab Report #1 DRAFT AND BONUS #2 | **ECB**: Chapter 13; 103-116; 67; 76-77  
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<tr>
<td>9</td>
<td>Oct. 29 (Tu), 31 (Th)</td>
<td>Analysis of Petite Mutants</td>
<td>Cell Lysate Lab Report (35 points)</td>
<td>ECB: Chapter 14</td>
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<tr>
<td>10</td>
<td>Nov. 05 (Tu), 07 (Th) (Please note: drop deadline is Sunday, Nov. 10!)</td>
<td>Bacterial Transformation AND Discussion of Transfection</td>
<td>EXAM 2 (20 points) (Weeks 5 - 9)</td>
<td>CP: 4.2.1-4.2.16</td>
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<td>11</td>
<td>Nov. 12 (Tu), 14 (Th)</td>
<td>Plasmid Purification AND PCR</td>
<td>Lab Report #2 - DRAFT</td>
<td>CP: 4.2.11-4.2.16; 4.2.19-4.2.27; 10.2.1-10.2.35 ECB: Chapter 10 (esp. pp. 335-338)</td>
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<td>12</td>
<td>Nov. 19 (Tu), 21 (Th)</td>
<td>Agarose Gel Analysis of Digested Plasmids and PCR Products</td>
<td>Yeast Mutagenesis Lab Report (35 points)</td>
<td>CP: 7.2.1-7.2.22; 10.1.1-10.1.32 (esp. 10.1.16-10.1.32) ECB: Chapter 10 (esp. pp. 326-328)</td>
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<td>13</td>
<td>Nov. 26 (Tu), 28 (Th)</td>
<td>No Class - THANKSGIVING RECESS (Nov. 27 – Dec. 01)</td>
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<td>15</td>
<td>Dec. 10 (Tu), 12 (Th)</td>
<td>Analysis of Transfection Results AND Fluorescence Microscopy</td>
<td>“Primer Design” problem set (10 points)</td>
<td>CP: 9.2.1-9.2.23, (esp. 9.2.1-9.2.4; 9.2.20-9.2.23) ECB: pp. 10-11; 378-379; 512-513</td>
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<td>16</td>
<td>Fri., Dec. 20, 10:00-12:00 Lapham 160 BOTH SECTIONS 601 &amp; 602</td>
<td>Emphasis will clearly be on last unit; however, the work is cumulative in nature.</td>
<td>EXAM 3 (20 points) (Weeks 10 - 15)</td>
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