BIOL 275L, Cell and Molecular Biology, Summer 2014
Number of Credits: 1
Laboratory session MW, 1100 am-0145 pm
Hale ‘Imiloa 106, CRN: 61016

INSTRUCTOR: Heather McCafferty
OFFICE: Hale ‘Imiloa 118
OFFICE HOURS: Tuesday 1100 am-1200 pm
TELEPHONE: daytime 621-1303 (off campus)
EMAIL: hmccaffe@hawaii.edu
EFFECTIVE DATE: Summer 2014, 07/07-08/14

WINDWARD COMMUNITY COLLEGE MISSION STATEMENT
Windward Community College offers innovative programs in the arts and sciences and opportunities to gain knowledge and understanding of Hawai‘i and its unique heritage. With a special commitment to support the access and educational needs of Native Hawaiians, we provide O‘ahu’s Ko‘olau region and beyond with liberal arts, career and lifelong learning in a supportive and challenging environment — inspiring students to excellence.

COURSE DESCRIPTION
Upon successful completion of BIOL 275L, the student should be able to perform and analyze the following:
- DNA/RNA isolation and quantification
- Polymerase chain reaction
- Bacterial subcloning
- Protein extraction and electrophoresis
- Enzyme kinetics and ELISA
Completion of the lecture component, BIOL 275, is required.

STUDENT LEARNING OUTCOMES:
- The ability to operate equipment used in cell and molecular biology laboratory
- The ability to conduct observations and experiments including DNA/RNA/protein extraction and electrophoresis, enzyme kinetics, ELISA etc
- The ability to produce lab reports using the standard scientific format.

SCHEDULE CHANGE:
The order or content of the labs may change if I feel that such changes will benefit the class. You will be informed in advance in the event of any such changes.
STUDENT EVALUATION:

Lab notebook - Students will be required to keep a notebook. It should be used to organize any notes, handouts, information gathered before or during the lab and lab summaries. The notebook will not be graded.

Lab summaries - These will be graded. Summaries will be part of the lab notebook and should follow the provided format for laboratory summaries. These will provide practice in writing and also in evaluating and organizing scientific results.

GRADING:

Performance in this lab will be evaluated based on the following –

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 lab summaries (30 points each)</td>
<td>270</td>
</tr>
<tr>
<td>2 lab examinations (100 points each)</td>
<td>200</td>
</tr>
<tr>
<td>Overall attendance and participation</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>500</strong></td>
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</table>

Letter grades will be assigned as follows:

- A – 90% or above in total points
- B – 80-89% of total points
- C – 70-79% of total points
- D – 60-69% of total points
- F – 59% and below of total points
- I – Incomplete; given at the instructor’s option when you are unable to complete a small part of the course because of circumstances beyond your control. It is your responsibility to make up incomplete work with a minimum level (or better) of achievement. Failure to satisfactorily make up incomplete work within the appropriate time period will result in a grade change for “I” to the contingency grade identified by the instructor (see Windward Community College Catalog).
- CR - 70% or above in total points; you must indicate the intent to take the course as CR/NC in writing by the end of the 10th week of classes (see catalog).
- NC – Below 70% of total points.
- N – Not given by this instructor except under extremely rare circumstances (e.g., documented serious illness or emergency that prevents you from officially withdrawing from the course); never used as an alternative for an “F” grade.
- W – Official withdrawal from the course. Refer to the Academic Calendar for withdrawal deadline.

POLICY ON LATE WORK

Students are expected to participate in all lab activities and submit required work on time. Late work will only be accepted with a valid reason (such as a medical emergency) and is at the
discretion of the instructor. In such circumstances, you should notify the instructor as soon as possible.

LABORATORY ATTENDANCE
Attendance is mandatory. There is a considerable amount of advance preparation required for each lab therefore you will not be able to make-up missed laboratory sessions. Students must have a lab coat and a pair of safety glasses for this class. Closed-toed shoes are also mandatory while working in the laboratory.

STUDENT RESPONSIBILITIES
Students should review the guidelines for lab safety and cleaning up. Students are expected to come prepared for the day’s activities. This involves reading the lab manual and any handouts before the lab session and bringing all necessary supplies such as a lab manual, lab coat, safety glasses.

LABORATORY HANDOUT
Individual labs will be based on BIOL 275L: Cell and Molecular Biology Lab manual, latest edition. UHM Publication. Extra reading assignments will also be provided. The World of The Cell, Becker et al. (8th edition), textbook for BIOL 275, will provide useful background information.

RECORDING DEVICES
The use of any device to record audio or video in the classroom or laboratory is prohibited.

DISABILITIES ACCOMMODATION
If you have a physical, sensory, health, cognitive, or mental health disability that could limit your ability to fully participate in this class, you are encouraged to contact the Disability Specialist Counselor to discuss reasonable accommodations that will help you succeed in this class. Ann Lemke can be reached at 235-7448, lemke@hawaii.edu, or you may stop by Hale ‘Akoakoa 213 for more information.
<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Date</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>7-Jul</td>
<td>use of micropipettes, centrifuge</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>9-Jul</td>
<td>Plasmid DNA extraction, spec readings</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>14-Jul</td>
<td>DNA digestion, electrophoresis -talk ligation</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>16-Jul</td>
<td>Genomic DNA/RNA extraction</td>
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<tr>
<td>3</td>
<td>M</td>
<td>21-Jul</td>
<td>enzyme kinetics with spectrophotometer</td>
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<tr>
<td></td>
<td>W</td>
<td>23-Jul</td>
<td>PCR</td>
</tr>
<tr>
<td>4</td>
<td>M</td>
<td>28-Jul</td>
<td>Exam 1</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>30-Jul</td>
<td>bacterial transformation</td>
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<tr>
<td>5</td>
<td>M</td>
<td>4-Aug</td>
<td>protein extraction and quantification</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>6-Aug</td>
<td>protein electrophoresis</td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>11-Aug</td>
<td>ELISA</td>
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<tr>
<td></td>
<td>W</td>
<td>13-Aug</td>
<td>Exam 2</td>
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LABORATORY SAFETY REGULATIONS

• No smoking, drinking, or eating is allowed in the laboratory.
• Bare feet are not allowed in the laboratory. Always wear covered shoes.
• You should tie back your hair, if it is long.
• A lab coat must be worn in the laboratory at all times. You must wear gloves and goggle for any laboratory using hazardous chemicals or microbes (they can be purchased at the campus bookstore).
• Broken glassware, slides, and cover slips must be disposed of in the “GLASS ONLY” box.
• Handle all hazardous chemicals and bacterial cultures with extreme care.
• Wash your hands after each lab and during, if necessary.
• Never mouth pipette a chemical.
• Never taste a chemical in the laboratory unless you are specifically instructed to do so by your instructor.
• Laboratory equipment should be used only after you have been instructed in its proper operation.
• Anyone attempting unauthorized experiments in the laboratory will be subject to disciplinary action.
• If you are in doubt concerning any laboratory procedure, consult with your instructor. Do not act in ignorance.
• Do not run in the laboratory. An accident may cause serious injury.
• Know how to look up various chemicals in the Material Safety Data Sheets (MSDS folder).
• Commit to memory the locations of the first aid kit, the fire extinguisher, the emergency shower and the emergency eyewash, as well as important emergency telephone numbers.
• Report all injuries to your instructor immediately.

CLEANING UP

• Properly clean and put away any instruments or equipment you have used.
• Wash and put back any items you used from your drawer.
• Clean and return all other supplies to your instructor or to their proper places.
• Wipe down your table before and after each lab period with disinfectant.
• Hazardous chemicals used in the lab must be disposed of in the proper containers.
• Paper, glass, gravel, and other solid waste should not be disposed of in the laboratory sinks.
• Discard all biologically contaminated items into the red Biohazard containers.
Format for Laboratory Summaries

Lab # & Title

Purpose:
This section should tell me what you expect to observe or find out by performing the experiment and how you will conduct your experiment. This section should be 2 - 6 sentences long.

Results/Data:
This is the section where you will include your figures and tables as well as any information for the laboratory (color, number of colonies, pictures of gels, etc.). Please follow the following format for tables and figures:

Table 1. The number of Staphylococcus aureus, S. epidermidis and Micrococcus luteus in MSA broth incubated in 37°C for 2 days.

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staphylococcus aureus</td>
<td>720,000</td>
</tr>
<tr>
<td>S. epidermidis</td>
<td>598,000</td>
</tr>
<tr>
<td>Micrococcus luteus</td>
<td>12,000</td>
</tr>
</tbody>
</table>

Figure 1. Numbers of three bacteria cultures in MSA broth for 2 days in 37°C

Conclusion:
This is your discussion! Please tell me what went on and what the outcome was. Please be precise but not verbose. Also comment on any erroneous results. This will turn out to be your longest and the most important part of your lab summary.

Questions and Answers:
Answers can be integrated into your discussion part.