UTA - Undergraduate Teaching Assistant
Biology 203L
Principles of Cell and Molecular Biology Laboratory
Syllabus for Fall, 2013
Location: Life Sciences North, Room 223

Faculty Coordinator: Dr. Anca Segall, biochair@mail.sdsu.edu, LSN 104.
Lab Coordinator: Felise Wolven, M.S., fwolven@mail.sdsu.edu, LSN220.

COURSE DESCRIPTION

The UTA (undergraduate teaching assistant) will assist the TA (graduate teaching assistant) section instructor in the education of undergraduate students in Biology 203L, the Cell and Molecular Biology Laboratory course. The undergraduate TA will earn 1 or 2 units of 299 Independent Study for the experience, depending on how many sections they serve, and will have the opportunity to be an “apprentice teacher”. UTAs will master the material in cell and molecular biology taught in the course, develop and teach good quality study habits, and acquire experience teaching. UTAs gain valuable work experience by helping the TA instructors with lab management and organizational issues that make the lab smoother for the students.

COURSE MATERIAL


COURSE HOURS AND CREDIT

The undergraduate TA may earn 1 or 2 units of 299 Independent Study for the experience, depending on how many sections they serve. Only 4 units maximum of 299 count toward a degree. Students may also volunteer for the teaching experience, without being evaluated with a grade at the end; however, work requirements and responsibilities will remain the same.

PREREQUISITES

Prerequisites for this class are completion of Biology 203 lecture and Biology 203L laboratory with a minimum grade of B in both courses. Completion of equivalent courses at other accredited colleges or professional lab experience may be substituted, if approved by the faculty or lab coordinators.
COURSE OBJECTIVES

Successful completion of this course, should help UTAs students accomplish the following:

- Reinforce and deepen their mastery of the principles they learned during the Cell and Molecular Biology 203 lecture and 203L laboratory courses through the teaching and application of scientific methods and experimental investigations in a laboratory setting.
- Mastery of skills and proficiency in the practical techniques commonly used in molecular biology laboratories through preparation and study, in order to teach them to other students. Specific techniques include aseptic technique, making plate and liquid growth media for bacteria, agarose gel electrophoresis of DNA, purification of genomic and plasmid DNA, transformation of a plasmid into competent E. coli cells and evaluation of a gene expression phenotype and genotype, PCR (Polymerase Chain Reaction), digesting DNA with restriction enzymes, knowledge of the parts and use of a microscope for observing eukaryotic cells or microorganisms, data collection and analysis of biochemical enzyme assays, and skilled use of tools such as micropipettes and centrifuges, spectrophotometers and pH meters.
- Reinforce competence in calculations commonly used for laboratory bench work, such as making solutions at percent or molar concentrations from solid or liquid stocks, graphing data and its interpretation and analysis, calculating cell counts in a culture, scaling protocol weights and volumes up or down. Mastery of these skills to be reinforced through preparation and study in order to teach them to other students.
- Gain experience teaching undergraduate students in a college level laboratory course while assisting graduate TA instructors.
- Gained valuable work experience with lab management and organizational issues that make the lab smoother for the students, while assisting graduate TA instructors.
- Develop discipline, maturity and good work habits by consistently meeting their responsibilities for job performance.
- Learn to practice and develop good working relationships with faculty supervisors, peers and students, in a professional environment.

What UTAs are expected to do.

- **Know the material.** UTAs are expected to come to their assigned lab section fully prepared with a thorough understanding of the principles and methods of each lab exercise. This is accomplished by reading the lab exercises in the lab manual ahead of each class. UTAs must be competent to answer questions from individual students about the day’s lab, and teach students who have trouble understanding the homework and board math calculations. This means you are responsible for understanding all material in the course manual, information in the syllabus, as well as safe use of the lab equipment. Don't be afraid to ask questions of the TA or lab coordinator.
- **Presentations.** Each UTA will present two PowerPoint presentations, under supervision of their TA, who will grade the presentations. Topics presented will be decided by the TA with input from the student. The TA is ultimately responsible for the learning content of the laboratory section, so your standards must equal or exceed theirs. One presentation is to be a 10-15 min. lecture on background principles for the lab (e.g. fermentation, solutions and serial dilutions), the other is a 5-15 min. lecture on practical procedures, i.e., how to do the lab exercises (e.g. agarose gel, transformation, plasmid preps).
- **Proctoring.** UTAs may be called upon to proctor quizzes and the final exam. Students observed attempting to cheat can often be deterred during the exam period by announcing...
general warnings to the class such as “keep your eyes on your own paper” or “no talking during the exam.” The names of any students observed cheating more extensively, eg. using an answer sheet or who ignore your warnings and persist in cheating, are to be reported to your supervising TA instructor, or handled according to their guidelines.

- **Attendance.** 100% attendance at all assigned lab sections is mandatory. Arrive on time and stay for the entire lab period. You may be excused from class ONLY under special circumstances with the approval of Dr. Segall, or if circumstances are completely beyond your control, as in accident or illness. Written documentation showing proof is required for excused absence. Unexcused absence will result in you being dropped from the program. Two or more excused absences will result in grade penalties.

- **TA meetings.** 100% attendance at the weekly TA meetings is mandatory. This is a large part of your training: how you will know how to do your job, where the supplies are located, how to use the equipment, and essential details about the week’s lab. You may be excused from the meeting ONLY under special circumstances with the approval of Dr. Segall, or if circumstances are beyond your control, as in accident or illness. Written documentation showing proof is required for excused absence. Unexcused absence will result in you being dropped from the program. Two or more excused absences will result in grade penalties.

- **Communication.** Maintain constant communication with your TA. Check every day for email messages from the lab coordinator. Don’t be afraid to ask questions of the TA or lab coordinator.

- **Safety.** All UTAs must thoroughly understand the safety section in the lab manual well enough to enforce safety procedures in classroom and help the TA supervise student safety. The UTA is expected to help the TA monitor students in the classroom to make sure they are operating equipment and performing laboratory techniques safely and in a timely manner.

- **Waste disposal.** UTAs must thoroughly understand all waste disposal procedures to help the TA supervise students in proper waste disposal.

- **Personal protective gear.** UTAs must wear a lab coat and the same personal protective equipment required of students during class.

- **Cleanup.** UTAs are responsible in assisting TAs to make sure the lab benches are clean and organized for the next class. UTAs do not do the cleaning, but should direct students to do their own cleaning and keep track of students who leave their workstations messy.

- **Professionalism.** UTAs are expected to consistently maintain a good attitude while in class, with respect for the 203L students, as well as for their supervising TA, and this extends to faculty and staff of the Biology department, and university. UTAs should demonstrate patience, kindness, respect, and a willingness to be of assistance. UTAs should not inappropriately socialize with the students, especially with students that they know personally. This can be construed by other students as favoritism or cheating. Treat all students with the same respectful, mature approach. In short, a professional and courteous demeanor is expected and appreciated.
What UTAs will NOT do.

- UTAs do not substitute for the TA. TAs must be present for all classes. The TA is ultimately responsible for the learning content of the laboratory section, so your standards must equal or exceed theirs.
- UTAs should not inappropriately socialize with the students. Maintain a professional presence while in class.
- UTAs do not grade student work. That includes, but is not limited to, practicals or lab reports. UTAs may report to the TA which students do not clean their benches before leaving class.
- UTAs are not required to do work for TAs outside of their assigned class periods, except for necessary preparation ahead of each week's class, which includes reading the course manual and documents.
- UTAs are not required to do any work that is not 203L related, nor personal errands for TAs.

GRADING

Students are graded based on the following criteria.

50% Two in-class powerpoint presentations:

one lecture on principles (25%)
one on practical lab techniques (25%)

50% Faculty evaluation by the TA. The TA will evaluate the UTA weekly, using the Faculty Evaluation sheet on the next page. Points are assigned, based on the ratings. An average weekly rating and cumulative score will be collected at the end of the semester to calculate into a final grade.

You may request and should automatically receive weekly feedback of your evaluation from your TA. Remember they are teaching you how to teach and organize a class. Take their criticism as learning material showing you the way to meet their standards. No one is perfect right off the bat – it takes time to learn well and you have a whole semester.
FACULTY EVALUATION SHEET

UTA Name ___________________ LAB # _____ Fall, 2013

Non-attendance Penalty
(1 point removed for each occurrence, to be deducted from the average weekly rating)

An unexcused absence will result in the student being dropped from the program.

_____ Number of excused absences from assigned labs for the semester.

_____ Number of days student is tardy for or leaves early from weekly lab meetings.

_____ Number of days student is tardy for or leaves early from assigned labs.

Weekly Lab Class Ratings (completed by Lab Instructor)

5…….Always  4…….Mostly  3…….Often  2…….Rarely  1…….Never

_____ UTA is prepared to teach small groups and/or individual students on lab topic.

_____ UTA is prepared to teach small groups and/or individual students on homework or board calculations.

_____ UTA speaks slowly, clearly, and projects voice when lecturing.

_____ UTA does a good job assisting TA to proctor quizzes or exams.

_____ UTA willingly brings out / puts away lab supplies and/or equipment.

_____ UTA properly enforces all lab rules, which includes monitoring student safety and proper waste disposal.

_____ UTA is a good example for students, by demonstrating safety in the lab.

_____ UTA wears lab coat and appropriate personal protective equipment (gloves, safety glasses, as necessary)

_____ UTA is competent in teaching students how to use lab equipment.

_____ UTA is supportive of and respectful to lab instructor.

_____ UTA willingly asks questions of lab instructor when needed.

_____ UTA is supportive of and respectful to students in class.

_____ UTA is approachable to students.

_____ UTA is responsive and helpful to every student in lab.

_____ UTA is professional with all students (does not inappropriately socialize with students during lab).

_____ UTA leaves lab clean and secure at the end of day.

__________ Cumulative score (subtotal weekly ratings minus subtotal penalty points)

__________ Average weekly rating of UTA ____________ Avg of weekly ratings to date
<table>
<thead>
<tr>
<th>WEEK</th>
<th>LAB#</th>
<th>TOPIC</th>
<th>LAB MANUAL PAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/26-30</td>
<td>1</td>
<td>Laboratory Safety. Introduction and Basic Skills Practice</td>
<td>1-8; 9-20</td>
</tr>
<tr>
<td>9/2-6</td>
<td>2</td>
<td>Solutions, Optical Absorption &amp; Least Squares Analysis. Monday class does Lab 2 and 3(1) on 9/9.</td>
<td>22-34</td>
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<tr>
<td>9/9-13</td>
<td>3(1)</td>
<td>Measurement of Enzyme Activity, Exercise 1. Graphing a standard curve. Monday class does Lab 2 and 3(1) this week.</td>
<td>35-39</td>
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<tr>
<td>9/23-27</td>
<td>4</td>
<td>Diffusion and Osmosis. Pouring agar plates for bacteria.</td>
<td>51-56; 57-64</td>
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<tr>
<td>9/30-10/4</td>
<td>5</td>
<td>Fermentation. Pouring an agarose gel; DNA Fingerprinting.</td>
<td>65-67; 68-76</td>
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<tr>
<td>10/7-11</td>
<td>6</td>
<td>Photosynthesis. Transformation of GFP into E. coli.</td>
<td>77-82; 83-90</td>
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<td>10/14-18</td>
<td>7</td>
<td>Mitotic and Meiotic Cell Division; Evaluate GFP plates. Streak out GFP colonies.</td>
<td>91-111; 112-120</td>
</tr>
<tr>
<td>10/21-25</td>
<td>8</td>
<td>Colony PCR of GFP. Plasmid DNA purification, aka DNA minipreps.</td>
<td>121-122; 123-128</td>
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<tr>
<td>11/4-8</td>
<td>10</td>
<td>Run Colony PCRs on a gel. FlyLab continued.</td>
<td>149-152</td>
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<tr>
<td>11/18-22</td>
<td>12</td>
<td>Enzyme Induction in a Prokaryote.</td>
<td>161-172</td>
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<td>11/25-29</td>
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<td>No classes except Monday class does Lab 11. Thanksgiving Holiday.</td>
<td>153-160</td>
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<tr>
<td>12/2-6</td>
<td></td>
<td>Proctoring Final Exam – Lab Practical. This is the last class meeting.</td>
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<tr>
<td>12/9-13</td>
<td></td>
<td>Finals Week. No classes. Semester over.</td>
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