Introductory Biology Laboratory
BIOLOGY 2281
Summer 2016

Class Information

Lecture (0U1): Monday: 10:00-11:15 A.M. at GR 3.420
Lab: at SLC 2.215 See Table below:

Day of the Week	Section #	Time	Instructor
Monday	1U2	1:00 PM – 3:45 PM	Dr. Lin
Tuesday	1U1	1:00 PM – 3:45 PM	Dr. Lin

Instructor Contact Information

- Dr. Wenju Lin wenju@utdallas.edu

Instructor Office hours and locations: (announced on May 23, 2016)

- **THE FIRST MONDAY MEETING STARTS ON May 23 in** GR 3.420
- **THE FIRST LAB STARTS ON May 23, 24 in SLC 2.215.**
- **There are no labs on the week of May 30 and 31.**

Name	Email Address

COURSE PRE-REQUISITES: BIOL 2311

COURSE DESCRIPTION

The primary goal of this semester-long course is to provide you with opportunities to learn bioinformatics and various laboratory skills and techniques used in molecular biology. Lectures discuss the theoretical aspects of the experiments carried out in the laboratory. Each laboratory experience builds or interconnects with the others and seeks a balance between biological content and conceptual understanding. The curriculum is tailored to the mission and strengths of the Department of Molecular and Cell Biology at the University of Texas at Dallas.

STUDENT LEARNING OBJECTIVES/OUTCOMES

Objectives: The goal of this course is to give students opportunities for hands-on learning of biological principles. This course teaches students the basic concepts of bioinformatics; the microbiological concepts and techniques such as microscopy and aseptic handling of microorganisms; bacterial transformation; eukaryotic cell divisions; biochemical concepts and techniques such as properties and identification of macromolecules, determination of the rate of an enzyme-catalyzed reaction and protein gel electrophoresis; DNA-centered molecular biology principles and techniques including polymerase chain reaction, restriction digestion, plasmid mapping and DNA agarose gel electrophoresis. Each laboratory experience builds or interconnects with the others and seeks a balance between biological content and conceptual understanding.

Outcomes: Students will therefore:

1. Be able to define, explain, and give examples of the basic concepts in bioinformatics, structure and properties of biologically important macromolecules, enzyme kinetics, eukaryotic cell divisions and bacterial transformation, and polymerase chain reaction.
2. Be able to perform basic molecular biology techniques in DNA manipulation.
3. Be able to use common biological laboratory skills, techniques and instrumentations.
4. Learn how to properly present and process data, interpret data analytically and draw appropriate conclusions.

COURSE MATERIAL

- Biology 2281 Lab Manual, 2016 by Dr. Wenju Lin, Dr. Elizabeth Pickett, Dr. Brenna Hill and Dr. Alice Zhou:
  Files of lab procedures and lecture slides will be posted at http://elearning.utdallas.edu on May 20, no purchase required. Printed Lab procedures are **required** for each lab exercise. Several topics include pre-lab, graph paper and report pages that need to be printed on letter or A4 size paper **single-sided**. Adobe reader needed.
- Turning Technologies ResponseCard RF LCD ("clicker") can be purchased at the University Bookstore and at the Off Campus Bookstore. Students are expected to have a clicker by lecture #1 (May 23) and bring it to every lecture session for the duration of the semester.
- Suggested reference books:
  Textbook for BIOL2311 or Biology, Raven et al., 8th Edition, McGraw-Hill, 2007. ISBN: 0-07-291845-4

COURSE EVALUATION/GRADING SCHEMES

Students may earn a maximum of 455 points. The following table lists the details of assessment items and the point distributions. The final grades for the course will be assigned as follows: (note partial grades such as A- or B+ etc will be issued and each letter grade listed below includes partial grades)

A (A-, A, A+): 405-455;
B (B-, B, B+): 360-404;
C(C-, C, C+): 315-359;
D(D-, D, D+): 270-314;
F :0-269

Assessment Activity	Points	Your points
Mid-term Exam including lab practicals	100	
Final Exam (including lab practicals)	90	
9 out of 10 Post-Lab Reports (@20 pts each)	180	
8 out of 9 Pre-lab/ quizzes (@10 pts each)	80	
Clicker points	5	
Total	455	

- **Post-Lab Reports:** The format of lab reports will vary from week to week depending upon the type of experiment that was performed. Although lab exercises will be done in groups of two or more students, each student must turn in his or her own typed report for grading. Your report should reflect your independent processing and presentation of data and answering related questions. Do not copy material from other students. Do not allow any other student to see or copy your work. Any form of scholastic dishonesty will not be accepted. Your work will be graded based on neatness, accuracy and completeness. **If you are not physically present during a particular lab, you are not entitled to turn in a post-lab report for credit**. One of the lowest report grades except **report E11** will be dropped.

- **Lab Exams:** Midterm and final exams will be given during the scheduled lab periods. Each exam will be composed of two parts: a lab practical part and a written test. The lab practical portion will carry approximately 1/3 of the total exam grade and will focus on important laboratory techniques. The format

of the written test will be primarily short answers and may include diagrams and illustrations. They are designed to evaluate your understanding of the basic biological concepts and laboratory methodologies. **You are responsible to study the contents of the lab sessions that you fail to attend.**

- **Pre-Lab Assignments/Quizzes:** Most of the lab exercises will have either pre-lab assignments or pre-lab quizzes to make sure that you are prepared for the experiment before you come to the lab. Pre-labs and quizzes are INDEPENDENT work. Do not copy material from other students. Do not allow other students to copy your work. You must turn in the completed "Pre-lab" at the beginning of the scheduled lab. Quizzes will also be administered at the beginning of lab. Students arriving late will not be given extra time to complete the quiz. One of the lowest pre-lab/quiz grades will be dropped.

- **eLEARNING**: All course related lecture notes and other material including announcements, photos of the lab results, review questions, and all of the grades will be promptly posted on eLEARNING. Please check it regularly. Contact your instructor with concerns regarding grades as soon as possible. Grades regarding E1-E5 will be finalized on **July 12** , grades regarding E7-E11 will be finalized on **August 8**.

COURSE POLICIES

- Attendance and Class Participation: Attendance of all lecture and laboratory sessions **ON TIME** is extremely important and thus mandatory, and will be recorded for each lab period. Your performance in the course is dependent on your attendance, so please make every effort to attend all classes as scheduled. Moreover, you are also expected to actively participate in all class activities.

  If you miss the first meeting of the lab due to late registration, it is your responsibility to contact your instructor by e-mail BEFORE **June 3**. Failure to do so will result in lost points in the course and will negatively impact your grade.

  Switching lab sessions after your scheduled lab is over is strictly prohibited. Switching is only allowed if you have a valid reason such as a medical/graduate school interview or a planned medical treatment. To get approval for any section switch, you must inform your instructor at least three days before your planned absence.

  You will have the opportunity to earn points based on your participation in the lecture class as documented via use of your clicker. You will not be able to earn participation points if you fail to bring your personally registered clicker to the lecture. Additionally, you will not earn participation points if you fail to properly utilize your clicker during lecture (i.e., turning it on, electronically registering in class, responding to questions, etc.). Each question is worth 1 point – 0.5 points for responding and 0.5 points for correct answers. Students who earn between 70%-100%, 60-69%, 50-59%, or 0-49% of the total possible clicker points will receive 5, 3, 1, or 0 course points respectively. Clicker points will be awarded during lectures #2-11. Practice questions designed to accustom you to using the clicker will be presented during lecture #1, but will not contribute to your clicker score.

- Pre-read: Before you come to each lab, read the procedural handout for background information and procedures for the experiment you will be doing. This helps you not only do well on the pre-lab quizzes or pre-lab assignments, but also to **save you time** and avoid unnecessary mistakes during the lab. Part of the lab procedures can include assignments that are due at the beginning of the lab session or the report pages that will be completed in the lab session.

- Late work: **Pre-labs** are due at the beginning of your lab session. No late pre-labs will be accepted. **Post-lab reports** are due at the beginning of the next scheduled lab unless otherwise noted (Report 4 and Report 11 are due at the end of lab session). Make a complete copy of your lab report before turning it into the TA. Any post-lab reports that are late will be assessed a **3-point** penalty for each **DAY** they are late. Arrange the time and location with your graduate TA to turn in your late reports. It is your responsibility to confirm that your TA actually received your late reports.

- Missed Exam/Quiz: No make-up exams or quizzes will be administered.

- Lab Safety: See handout provided on eLearning. Safety glasses will be provided in the laboratory.

COURSE OUTLINE/CALENDAR

- **THE FIRST MONDAY MEETING STARTS ON May 23 in** GR 3.420
- **THE FIRST LAB STARTS ON May 23, 24 in SLC 2.215.**

- **There are no labs on the week of May 30 and 31**

Week of	Monday , Tuesday Lab Exercises and Exams	Pre-Lab or Quiz	Report Due (in lab)	Monday Lecture Topic
May 23, 24	E1: Bioinformatics, E2: Microscopy	Pre-Lab E2		May 23 : E1, E2
June 6, 7	E3: Microbial Techniques	Quiz - E3	R1, R2	June 6: E2, E3
June 13,14	E4: Eukaryotic Cell Divisions Analysis of E3 results	Quiz - E4	**R4**	June 15: E4
June 20, 21	E5: Restriction Enzyme Digest and Plasmid Mapping	Pre-lab E5	R3	June 20: E5
June 27, 28	**Mid-term Exam (E1-E5) / lab practical** E7: Extracting and Amplifying mtDNA (Day 1)	Quiz - E7	R5	June 27: E7
July 11,12	E7: Extracting and Amplifying mtDNA Day 2 E8: Bacterial Transformation	Quiz - E8		July 11**:** E8
July 18, 19	Analysis of E8 results E9: Spectrophotometry	Pre-lab E9	R7	July 18: E9
July 25, 26	E10: Enzyme Assay	Quiz - E10	R8, R9	July 25: E10
August 1, 2	E11: Protein Separation by Gel Electrophoresis	Pre-lab E11	R10, **R11**	August 1: E11
August 8	**Final Lab Exam/Lab Practical (E5-E11)**			10 AM-12:45 PM 1PM-3:45 PM

Abbreviations: E= Experiment; R=Report

Report 4 and Report 11 are due at the end of assigned lab hours.

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus. Please go to http://go.utdallas.edu/syllabus-policies for these policies.
These descriptions and timelines are subject to change at the discretion of the Professors.