Course Objectives: The goal of this course is to give students practical experience with a variety of the laboratory techniques of cell biology. These techniques form the foundation for the incredible revolution in our knowledge and understanding of cellular structure and function that has taken place over the last two decades.

Requirements:
- Students are expected to attend and to be on time for ALL laboratories and to be prepared by completed a pre-lab in their laboratory notebooks BEFORE coming to class.
- Two unexcused missed labs will result in an automatic failure of the course. Entering the lab more then 15 minutes after the scheduled start time counts as a lateness. Two lates = 1 absence
- Lab coats must be worn at all times while in the lab. No Exceptions.
- Shorts, Short skirts, and open-toed shoes are not to be worn in the laboratory.
- Food/Beverages/Gum are strictly forbidden in the laboratory.
- Lab Notebook – Bound notebook (Not Spiral) must be brought to every lab session.
- Four lab reports will be required for the course.
- There will be one mid-semester exam and a cumulative final exam.
- Lab notebook will be graded throughout the semester.
- Technique Points will be awarded to each student at the end of each lab session by the instructor and teaching assistant. These points are based on several factors including but not limited to: Preparedness, lab technique, neatness, teamwork, organization and experimental results.

Grading:
Midterm = 20%
Cumulative Final = 30%
Lab Reports = 20%
Lab Notebook = 15%
Lab Technique and Quizzes= 15%

Lab Notebook:
The lab notebook is the place where you will record what you have done and what you have found out, in a neat and orderly manner. Keeping accurate records is critical to the process of scientific discovery. In Industry, the lab notebook is often vital to the patenting process, especially if there is litigation over priority. Many companies require that each day's work be signed by the investigator and a witness, and in many cases, notebooks are periodically collected and notarized. Each company publishes its own, very stringent set of regulation for lab notebooks.
You will need to keep a lab notebook for this course which must be brought to every class. Notebooks will be checked periodically without warning. While in lab, all methods/steps actually performed should be documented as you execute them with the details such as exact measurements and observations. Any notes or changes to protocol need to be documented, in addition to work done. You should record the times when you start and stop a procedure, do not rely on your memory. Record the raw data, make drawings if necessary, attach printer output/photos, etc. Be sure to label the data so that you can understand it at a later date. Record all observations that you think might be significant. The notebook should include all the information needed to prepare a formal laboratory report.

1. Each notebook must have an accurate, up-to-date table of contents, at the beginning of the notebook.
2. Each entry must have a title, a date, and a statement of purpose or intent.
3. Each entry must end with a conclusion and/or statement of what must be done next.
4. Make entries at the time the work is performed. Do not write notes on scratch paper and make entries in your notebook later.
5. Make neat legible entries in blue or black ink. No Pencil.
6. Use the pages in consecutive order. Do not leave any blank pages, or room for data or data analysis to be added later. All entries should be chronological at the time the data or analysis was completed. You may add a note at the end of one entry referring to the page of the data or the analysis if there is intervening material.
7. For computer-generated records, photographs, or hand-drawn graphs, tape the material into your notebook. Make reference to the printout on the page. If it is necessary to put such inserts into the notebook, mount them so that they do not cover written information.
8. If data or samples from another source are entered, be sure to indicate the source clearly, including the name of the person from which they were obtained.
9. Record all steps in sufficient detail so that any person skilled in the filed would be able to repeat the work and obtain the indicated results.
10. A protocol that is used for the first time must be written out in full. If it is a standard protocol that you use on subsequent occasions, you may simply reference the first citing subsequently giving only modifications or experimental details (e.g. particular strains, enzymes, etc.)
11. Use only standard abbreviations
12. Record the name of all group members in your lab notebook.

**Lab Report:**

There is no minimum/maximum number of pages. Lab reports are due and must be submitted in class on the dates in the lab schedule. Late lab reports will be penalized 15% for every day they are late.

Reports must be typed, single-spaced, 12 pt Times New Roman font. All lab reports must adhere to the format in “Writing lab reports for biology” posted on blackboard.
LAB SCHEDULE

Week 1 (1/23/17): Intro to Lab/Lab Safety
  Microscopic Analysis of Mammalian Cell Types

Week 2 (1/30/17): Establishing an African Violets Cell Culture (908)
  Slides Continued

Week 3 (2/6/17): Cell Fractionation: Isolation of Chloroplast & Mitochondria (910)

Week 4 (2/13/17): Cell Fractionation (910)
  Affinity Chromatography of Glucose Binding Protein (277)

Week 5 (2/20/17): Lab Report 1 Due: Cell Fractionation
  Affinity Chromatography Results
  Purification of Restriction Enzyme EcoRI (302)

Week 6 (2/27/17): Purification of Restriction Enzyme EcoRI Cont. (302)
  Exploring Biotech w GFP (303)

Week 7 (3/6/17): Exploring Biotech w GFP cont (303)
  Review

Week 8 (3/20/17): MIDTERM
  Lab notebooks Due

Week 9 (3/27/17): Affinity Chromatography (277)
  Lab report 2 Due: Exploring Biotechnology with GFP

Week 10 (4/3/17): Affinity Chromatography Results
  Protein Diversity (150)

Week 11 (4/10/17): ELISA (278) /Pregnancy Test (279)
  Lab Report 3 Due: Affinity Chromatography

Week 12 (4/17/17): Western Blot (317)

Week 13 (4/24/17): Western Blot Results
  Morphology of Cancer Cells (990)

Week 14 (5/1/17) FINAL EXAM
  Lab Report #4 Due: Western Blot