Guidelines for Writing a Lab Report

Why write a lab report?

There are several reasons to write a lab report. First, the writing process allows one to reflect upon the exercise performed in the course. As a student you will be given a number of learning exercises. The report is your chance to demonstrate your understanding of the theoretical and practical aspects of the assigned experiments.

Secondly, you will be learning how scientists report their findings. The approach to a lab report will be completely different than something you would turn in for a literature course, for example. Although all the same rules of grammar and spelling will be applied to the report, the main differences are the structure, content, and particularly the tone of the writing. Big fancy words are not important. Fancy SAT words can be a distraction to those just wanting the facts. Lastly, the reports will help improve your written communication skills. Writing is an extremely important skill to master. To some it comes easily and others it will be extremely painful. A major goal (and significant part of your grade) for this course is to help you become a better writer. We will do whatever we can to help you achieve this goal.

How to write a lab report

The format of the lab report is as follows:

Title
Introduction
Materials and Methods
Results Discussion
References
Figures/Tables

Title: All lab reports must include a title describing the subject matter of the exercise and or results. Spend some time thinking up an appropriate title for you report. An inappropriate title would be “Lab report on microbial contamination of food”. Reports lacking a quality title will be penalized.

Introduction
This section should start with a broad overview regarding the topic under investigation. Having a sentence describing its importance catches the reader’s attention and sets you up for the following introduction.

Next, you can provide a background about the topic by answering questions regarding what is known or not known about the topic. This will require researching the background information of the topic. The library comes in handy here. One can get scientific information from databases from the UCSC library or you can find specific books on the subject. It is common practice to backup claims and your sources of information with a reference or citation. We expect that you will do this in your reports.

The last part of the introduction is where you establish the goals, hypotheses, or objectives of
the study and provide a brief reason why the work was done. You can even try to convince your reader that it is important work.

**Materials and Methods:** This section is intended to detail how the results were obtained. In the most concise manner and in paragraph form, describe things such as growth medium composition, sampling and processing techniques, analytical techniques, and other important information regarding gathering and analyzing data. Ideally, one should be able to repeat your experiment by just following your methods section. It is also important to organize this section with subheadings if the exercise has multiple parts. The writing style is in the 3rd person, past tense perspective, and is not a regurgitation of the protocols used in class.

**Results:** Here is when you start writing a “story” about your experiment. This is a written section that contains processed results (i.e. figures and tables). The approach to this section is to write a description of each table and/or figure. Try to address what trends you observe in each figure or table. You don’t need to explain why your results are they way they are. That is for the discussion section. The writing style again is in past tense but it is okay to say “I (we) observed…” or “The trend in Figure 1 exhibited…” It is not acceptable to include figures or tables that are not described somewhere in the report.

**Discussion:** Students struggle the most with this section because it requires critical thinking. A good discussion section will elevate your paper from average to excellent. The approach to this section is to find out what the data and trends mean. Try to answer the question: what is the significance of my results? If you have a CFU/ml number what does that mean and how does it compare to other enumeration data of similar samples. The common mistake is to just rephrase the results and not say anything about why the results are what they are. You can also make speculations and bring in results and ideas from other studies that support your statements. If you observed a trend that differed from a known trend you can try and explain why this occurred. Lastly, in this section you should reference other works or scientific studies to help strengthen your discussion. This is essential achieving an “A” paper.

**References:** This section is simple. You list your sources of information used throughout your lab report. There are several formats to follow. However, you will receive an example journal article. Please follow the format of that paper. The only acceptable citations are scientific works published in journals or books. No http or URL citations.

**Figures/Tables:** Attach each figure or table on a separate sheet of paper at the end of the report with one page per figure or table. Each figure/table should be numbered consecutively and must have a caption and description of any ambiguous information (e.g. abbreviations).