# BIOL1900 Major Lab Assessment - Task Outline 2018

Complete sections A to C below using the separate template provided. You will need to use the entire cohort data spreadsheet that is available within the Assessment folder on Blackboard to assist in completing these tasks. Please ensure you answer each item in the correct space provided on the template.

The correct file to use is named: ***Lab_Data_FOR_ASSIGNMENT_2018.xlxs***

Font: Any style, 12 point, 1.5 line spacing

Due Date:

- Odd numbered prac groups - Monday May 21st 5.00pm
- Even numbered prac groups - Monday May 28th, 5.00pm

Weighting: 20%

Late Submissions: The penalty is 10% of the total marks available for the assignment per day (including weekends) – so 2% of the course grade (n.b. 20% available) per day

Prac Attendance: Students who fail to attend any of the 6 pracs throughout the semester without a legitimate and documented excuse will be penalized on this assignment at 5% of the total marks available for the assignment per prac missed - so 1% of the course grade (n.b. 20% available) per prac missed.

Submission: Via the TurnItIn link within the Assessment folder of the BIOL1900 Blackboard site. Students will receive an email receipt upon successful submission. If you have a problem with submission and do not receive an email receipt, you MUST email your completed assignment to the course coordinator BY THE DUE time and date. This version of the assignment will be marked.

Referencing: If you use journal articles, websites, books, magazines or newspapers then please use APA format. Otherwise, no referencing is required. It is possible to score 100% on this assessment piece without referencing external sources. The emphasis is on presenting and drawing inferences from the data that you have collected.

**Part A - Measuring Error**

Biophysical measurements used to assess an individual's health, fitness or performance are always susceptible to measurement error. If this error is too large, an incorrect interpretation of the individual's biophysical profile can occur. This can lead to providing misleading advice in your roles as physical education teachers, nutritionists, coaches, sport scientists or exercise physiologists.

For Part A, you are required to complete the following:

1. Select only **1** of the following 3 error measurement tests performed in Labs 2 and 3
    a. Inter-tester reliability (Medial Calf Skinfold – Lab 3)
    b. Intra-tester reliability (Medial Calf Skinfold – Lab 3)
    c. Inter-method reliability (Heart Rate – Lab 2)
2. Briefly define your chosen reliability measurement (i.e. what does this reliability measurement mean?). Do not define the biophysical measure itself (i.e. do not talk about Skinfolds or Heart Rate). (Knowledge)
3. Provide an estimate of your selected reliability measurement across the entire cohort. To do this, you will need to perform a simple data analysis / calculation on the single column of data relevant to your selected error measurement. (Data Analysis)
4. Briefly comment on the level of measurement precision indicated by your selected reliability measurement. Is the level of precision considered accurate or not? You should compare the data you calculated in the previous step to the level of precision that is recommended for the reliability measure you selected. The Coombes and Skinner (2014) text cited in the lab manual contains this information. (Analyse)
5. Briefly describe and explain two unique and specific sources of error relevant for the biophysical test associated with the reliability measure you selected. That is, what can affect the correct measurement of either Skinfolds or Heart Rate using the equipment and the techniques performed in the lab? Do not list a broad error such as "human error" - the error should be specific to the error measurement you selected. Not reading / following instructions and incorrect calculations are also inappropriate reasons. (Knowledge)

**Part B - Comparing Groups Statistically**

Everyday in the media we hear about people making claims regarding health, diet and fitness. For example, "chocolate is good for you", "standing at work is better than sitting at work" or "bare-foot running is better for you than running with shoes". But how do we know whether these statements are either true or false? As professionals in this field, we can't just believe them at their word. We need to analyse the evidence and data objectively to determine whether claims are true or not. Part of this process is to use statistics to make objective comparisons between groups. Statistics, if used appropriately, allow us to determine if there are reliable differences or relationships between different groups. For example, is there a relationship between how much chocolate people eat and the incidence of cardiovascular disease? What about, is there a difference in the blood pressure of a group of people who sit at work all day vs. people who stand? It is not professional or accurate to make a judgment or comparison between groups without providing evidence to back up your claims.

For Part B, you are required to complete the following:

1. Select **one** biophysical measurement that will allow you to make a single comparison between **two** groups.
2. List the measure and the comparison you are going to make. For example, "standing height to compare the differences between males and females". Also provide a brief prediction of what you think might be the result of the comparison. This is known as a hypothesis. For example, "I believe that males will have a greater standing height than females". (N.b. Do not use this particular example for males vs. female as your selected comparison in the assignment). (Knowledge)
3. Using the entire cohort data, run a statistical test that compares the biophysical measurement between your nominated two groups. List the complete name of the specific statistical test that you used. Once you have run this, list the values that were generated that you used to determine if there was a difference between the groups as well as the mean ± standard deviation of the two groups. N.b. Don't list all of the values generated from the statistical test, only the values that you used to determine if there was a difference between the two groups. (Data Analysis)
4. Plot a graph that clearly shows the data, with correct axis labels, correct units and an informative and accurate caption. The caption should have enough information for any person (regardless of expertise) to understand what the graph is. (Data Analysis)
5. Provide a brief explanation of your results. Was there a difference between your two groups and what evidence / data allowed you to come up with this conclusion?

(Analyse) Were your results expected (i.e. did they align with your hypothesis)? (Analyse) Based upon knowledge you have obtained in the course about anatomy, physiology and growth and development, explain why there was or wasn't a difference between the two groups? (Apply)

**Part C - Understanding Differences Between Populations**

In your future roles as physical education teachers, nutritionists, coaches, sport scientists or exercise physiologists, you will work with, and in, a diversity of groups and communities. For example, you may work with the elderly, elite athletes, children or the general population itself. Different groups will be characterised by different biophysical attributes and will have different attitudes towards physical activity, health and exercise. These measurements and attitudes may be different to that which you have experienced yourself in your personal, family, peer or community contexts to date and it is important you understand the impact of these differences.

For Part C, you are required to complete the following:

1. Select three biophysical measures from the list below.
    a. BMI
    b. Waist Circumference
    c. Grip Strength
    d. Flexibility – Sit & Reach
    e. Vertical Jump Height
    f. Standing Long Jump
2. For each biophysical measure, calculate **one** measure of **central tendency** and **one** measure of **variability** using BIOL1900 data relevant to **your own sex**. (Data Analysis)
3. Using the measure of central tendency and variability calculated above, determine where your own data lies for each biophysical measure. Use qualitative rankings and percentiles to describe this (e.g. "average", "near the 25$^{th}$ percentile", "well above average", "between the 75$^{th}$ and 100$^{th}$ percentile"). Note – if you were unable to obtain your own data during the lab, use another person's data. You can use a random person from the database (e.g. one that has comprehensive information about exercise history, etc) or a person that you know. (Data Analysis)
4. For **one** biophysical measurement, provide a reason for your ranking with respect to **the BIOL1900 cohort**. Is there something specific about you or some generalization

about BIOL1900 students that can explain your ranking relative to the cohort? Your reason should be somewhat specific to that biophysical measurement. For example, if talking about grip strength, the reason should relate to why or why not your grip strength is different to the BIOL1900 cohort. Simply saying "I have a general interest in health and fitness" doesn't explain why your grip strength is different to the BIOL1900 cohort. (Apply)

5. Now, for these same measures, compare yourself against **normative data** for the general population found in the lab handout. To do this you should repeat steps 3, 4 and 5 with reference to the normative values listed in the relevant tables. (Analyse and Apply)