Lab Submission Worksheet

Laboratory 3 — Blood Pressure

Lab Group: _____ Date: _____

Student 1	Student 2
Name: _____	Name: _____
Student number: _____	Student number: _____

Instructions

Step 1

Complete the Lab and take screenshots requested. They will be used to answer the questions.

Step 2

Print and attach the following labeled plots:

1. Figures of the filtered data and then detrended data for each file with labeled systolic, mean arterial and diastolic values. (see figures 2 and 5 in the lab instructions)

Step 3

Write your answer to all questions in the provided boxes.

Step 4

Submit to the drop box for "sysc4203" outside ME4460 before **2:00pm** one week after the lab.

2.0 - Data Collection Step

a. Open your saved data files in Matlab and plot the filtered data. Find your systolic pressure on this plot. Detrend the data (Appendix B) and determine when the MAP is observed. Correlate the time MAP is observed in the detrended plot to the original recording to determine the pressure value. Calculate the estimated DP using the equation: MAP = 1/3 (SP – DP) + DP. Include figures of the filtered data and the detrended data for each file and label your systolic, mean arterial and diastolic values on both, similar to figures 2 and 5. Fill in those values in the table below. Show your work.

	Systolic	MAP	Diastolic
Trial 1			
Trial 2			
Trial 3			
Average			

b. What is your heart rate (in beats per minute) for each file? (Use the middle 5-10 beats where the 'ripples' are).

c. What was the delay between the heart beat on the ECG and the heart beat on the blood pressure waveform (for each file)? Why would a delay exist? (hint: compare the x-axis values of the QRS peaks with the x-axis values of the ripples during the 'ripples' section of your BP signal)

3.0 - Effect of Arm Position

a. Using the 'arm' files, calculate the average MAP, systolic and diastolic blood pressures for the arm above head files. Include a plot of each blood pressure signal and label your systolic and diastolic values.

	Systolic	MAP	Diastolic
Trial 1			
Trial 2			
Trial 3			
Average			

b. Using the 'floor' calculate the average MAP, systolic and diastolic blood pressures for lying down files. Include figures of the blood pressure and label your systolic and diastolic values.

	Systolic	MAP	Diastolic
Trial 1			
Trial 2			
Trial 3			
Average			

c. What if any is the effect of arm position on the blood pressure values you recorded (for 'relaxed', 'arm', and 'floor')? (Use the effect of gravity in Appendix A to clearly explain your results).

d. If you were upside down, would your MAP increase or decrease? What about your systolic and diastolic pressures? Why? (Use the effect of gravity in Appendix A to clearly explain your results).

4.0 - Effect of Exercise

a. Calculate the average MAP, systolic and diastolic blood pressures after exercising. Include figures of the blood pressure and label your systolic and diastolic values.

	Systolic	MAP	Diastolic
Trial 1			
Trial 2			
Trial 3			
Average			

b. What is your average heart rate (in beats per minute) for each file? (Use the first and last 5-10 beats).

c. What is the effect of exercise on your blood pressure? Why?