



**German Jordanian University
School of Applied Medical Sciences
Department of Biomedical Engineering**

BM213: Anatomy and physiology Lab

Course Catalog

1 Credit hour (3 hrs laboratory)

The aim is to know the difference between anatomy and physiology, composition, development of each structures, the relationship between structure and function.

Topics covered include the anatomical position and its importance, anterior and posterior surface landmarks , compare between the dissecting and compound light microscope , skeletal system ,physiology of the muscular system ,physiology of the nervous system , acquire ECG signal then correlate it with heart sounds, blood pressure measurement , urine analysis , blood analysis and special senses.

Moreover, the student will be able to know the most common faults then search on the possible solutions to fix problems as a biomedical engineer for the devices that will covered during this lab.

Lab Instructor

Lab Instructor	Dr. Walid Alzyoud
Office location	Building M, M-509
Office phone	+962 6 429 4444, Ext: 4401
Email	Walid.alzyoud@gju.edu.jo

Lab Engineer

Lab Engineer	Eng. Maryam Saqer
Office location	Building M, M-117
Office phone	+962 6 429 4444, Ext: 4438
Email	Maryam.Saqer@gju.edu.jo

Evaluation		
Assessment Tool	Weight	Expected Due Date
Lab Reports	20 %	Each report is due at the beginning of the next lab session
Quizzes	10 %	At any time in any lab session
Midterm Exam	30%	Assigned at the beginning of each semester
Final Exam	40%	Assigned at the beginning of each semester
Total	100%	After completing final exam

Topics Covered		
Week	Experiment No.	Topic
1	-----	Lab Introduction
2	Experiment 1	Language of Anatomy
3	Experiment 2	The Microscope
4	Experiment 3	The Skeletal System
5	Experiment 4	Physiology of the Muscular system
6	Experiment 5	Physiology of the Nervous system
7	Exam	Midterm Exam
8	Experiment 6	Sensory Physiology
9	Experiment 7	Blood Analysis
10	Experiment 8	Physiology of the Cardiovascular System :The Heart and ECG
11	Experiment 9	Blood Pressure
12	Experiment 10	Urine Analysis
13	Exam	Final Exam

Objectives and Outcomes	
Objectives	Outcomes
1.Understand the Language of Anatomy	1.1.Understand the Anatomical position and its importance. 1.2.Learning the Surface Anatomy ,Body Orientation and direction. 1.3.Mention the Body cavities ,Body Planes and sections.
2.learning and compare between the Dissecting and Compound Microscope.	2.1. Identify the parts of dissecting and compound light microscope and give their functions. 2.2. Describe and demonstrate the proper techniques for care of the microscope. 2.3. Search on the most common faults of Microscope and how the BME can solve it.

3.To be familiar with certain bones in the skeleton.	3.1. To become familiar with anatomical terminology. 3.2. To identify parts of the skeleton and some of its prominent features. 3.3. To memorize the bone of appendicular skeleton and some bones of axial skeleton.
4.Understand Properties of the Muscle twitch.	4.1.Acquire the twitch signal and analyze the contraction Time, Relaxation Time, latent period and twitch time . 4.2.Apply some factors to study the characteristic of the Human Muscle . 4.3.Analyze when the summation ,complete and incomplete tetanus occur from the results obtained .
5.Understand the Reflex and the Reaction time.	5.1.Compare between simple and complex reflex. 5.2.Measure the reaction time.
6.Familiarize the students with their senses.	6.1.To know the sensory and related phenomena, and some sensory illusions. 6.2.To differentiate between the Rinne’s Test and Weber’s Test.
7.Learning the students with some basic blood analysis test.	7.1.To Measure the Hematocrit 7.2.Measure the Hemoglobin 7.3.To know the ABO Type for any student. 7.4.To search on faults and solution of hematology Analyzer.
8.Learning how to acquire the ECG Signal and correlate it with heart sound.	8.1.Acquire the ECG signal 8.2.Analysis the ECG Signal include calculate the P,T,R Wave amplitudes 8.3.Calculate the Heart rate and Cardiac output. 8.4.Correlate the ECG Signal with heart sound to measure the Lub ,dup interval.
9.Understand the blood pressure and how we can measure it.	9.1.Know the operation principle of sphygmomanometer. 9.2.Measure the Blood pressure for the students.
10.To make some manual test of urine sample.	10.1.Collect urine sample then doing physical examination on it. 10.2.Do the chemical examination of a urine sample and diagnose possible disease from the positive test sample.

Lab Report Requirements	
Report section	Description
Introduction	This section should provide the context and motivation for the experiment, briefly explain relevant theory in sufficient detail, introduce any relevant laws, equations or theorems, and clearly state the aim or research question that the experiment is designed to address. You should try to write it in your own words, rather than paraphrasing the lab manual (but if you have to, be sure to include the appropriate references). It’s always a good idea to read the entire experiment in the manual before

	you begin your introduction.
Procedure	This section must include a description of the procedure followed. It should not simply be a re-statement of the procedure section of this manual. You should interpret the procedure section and develop your own step-by step method.
Results	In this section, you present the main data collected during your experiment. Each key measurement needs to be reported appropriately. Data are often presented in graphs, figures or tables. These need to be labelled appropriately to clearly indicate what is shown. Tables should be labelled numerically above the table as Table 1, Table 2, etc. Everything else (graphs, images, diagrams etc.) is labelled numerically below the figure as Figure 1, Figure 2, etc.
Discussion	This section should demonstrate how will you understand what happened in the experiment. You should identify and comment on any trends you have observed, compare the experimental results with any predictions, identify how any sources of error might impact on the interpretation of your results, suggest explanations for unexpected results, and where appropriate, suggest how the experiment could have been improved.
Conclusion	This section should provide a message summing up what has been learned from the experiment such as: briefly restate the purpose of the experiment (the question it was seeking to answer), identify the main findings (answer to the research question), note the main limitations that are relevant to the interpretation of the results, summarize what the experiment has contributed to your understanding of the problem.
References	List all sources that you have referred to in the body of your report. These can include references to accepted literature values or equations you use in your calculations. You should use proper referencing techniques.
Appendix	It contains material that is too detailed to include in the main report, such as tables of raw data, software code or detailed calculations.
Formatting	Font type: Times New Roman. Font size: 12 for the main paragraphs and 14 bold for the titles. Justify the paragraphs. Numbering. Figures should be inserted in the center of the page and they should be labeled below the figure with font size 10. Tables should be inserted in the center

Policy	
Attendance	Attendance will be checked at the beginning of each lab session. University regulations will be strictly followed for students exceeding the maximum number of absences (20%).
Reports	Each student must hand his\her own separate report. Laboratory reports

	are due to <i>one week after</i> the experiment was carried out and it will be collected at the beginning of each laboratory. If any report is not submitted to the TA by the deadline, it will be judged as " LATE ".
Examinations	The midterm and the final exams are closed book tests. Students who are not able to attend an examination (medical or another emergency) must notify the instructor. Make up tests require a Valid University excuse.
Student Conduct	It is the responsibility of each student to adhere to the principles of academic integrity. Academic integrity means that a student is honest with him/herself, fellow students, instructors, and the University in matters concerning his or her educational endeavors. Cheating will not be tolerated in at all. University regulations will be pursued and enforced on any cheating process.