

Course Syllabus

BMT 228

- 1. Course number and name:** BMT 228/ Introduction to Biomechanics
- 2. Credits and contact hours:** (2 + 0) credit hours, (2 + 0) contact hours
- 3. Instructor's name:** Dr. Wissal Mesfar
- 4. Text book, title, author, and year:**

- a. Books or notes:**

- Susan, Hall, "Basic Biomechanics", 6th Edition, 2012.
- Lecture notes (available on LMS system)

- b. Other supplemental materials:**

- 5. Specific course information**

- a. Brief description of the content of the course:**

This course presents the fundamentals of biomechanics starting by an Introduction to Biomechanics, two chapters on kinematic and kinetic concepts to analyze human motion including presentation of the quantitative and qualitative approaches to analyze human motion and following by a chapter dealing with the use of static equilibrium equations to solve problems applied to the different human joints, determination of the mechanical advantage and the determination of the center of gravity of multi-segment systems. Finally, two chapters will be devoted to the presentation of the biomechanical aspects of the bone and muscle structures.

- b. Prerequisites or co-requisites:**

Pre-requisites: None

Co-requisites: None

- c. Indicate whether this course is a required, elective, or selected elective (as per Table 5-1) course in the program:**

Required

- 6. Specific goals for the course**

- a) Specific outcomes of instruction:**

By the end of this course, the student should be able to demonstrate the ability:
1- to understand the different biomechanical concepts to analyze human motion.

2- identify the biomechanical concepts and tools should be used to analyze a biomechanical problem.

3- to solve biomechanical static problems related to human joints and establishes the equilibrium equations to analyze the biomechanics of the joint kinetically.

4- to describe the bone anatomy (macroscopic and microscopic), the processes involved in the normal growth and maturation of bone, and explain how the material constituents and structural organization of bone affect its ability to withstand mechanical loads as well as to describe the effects of exercise and of weightlessness on bone mineralization and the bone remodeling process.

5- to describe the skeletal muscles function, anatomy of the muscles, the effects of the force–velocity and length–tension relationships and of the electro-mechanical delay on muscle function.

6- to identify the basic behavioral properties of the musculotendinous unit, explain the relationships of fiber types and fiber architecture to muscle function. Ability to discuss the concepts of strength, power, and endurance from a biomechanical perspective.

b) Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

	Course outcome	Abet (a-k)
1	Ability to select and define the knowledge, techniques, skills, and modern tools of biomechanics.	a, b
2	Ability to describe the different concepts of biomechanics to analyze the human motion.	a
3	Ability to identify, analyzes, and solves broadly-defined biomechanical problems.	b, f
4	Ability to talk about biomechanical topics, write a report and develop a presentation.	g

c) Brief list of topics to be covered

Topics
Introduction of the course - What is Biomechanics
Kinematic Concepts for Analyzing Human Motion
Kinetic Concepts for Analyzing Human Motion
Biomechanics of Resistance Exercise
The Biomechanics of Human Bone Growth and Development
The Biomechanics of Human Skeletal Muscle
Presentation of Biomechanical Project by Students

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
a.	At the end of each chapter, one assignment should be done after chap 1, 2, 3 and 5 and two assignments should be done after chapter 4.	One week after the end of the chapter	All the assignment accounts for 25%
b.	1 Mid term	Week 9	25%
c.	Report and Oral presentation on a Biomechanical subject should be submitted at the last lecture	Week 14	10%
d.	Final Exam	Please refer to the Final exam schedule	40%