

SAGRADO

Universidad del Sagrado Corazón

SCHOOL OF HEALTH AND SCIENCES

SYLLABUS

TITLE:	Kinesiology
CODE:	CFI 302
PREREQUISITE:	BIO 102
CREDITS:	3 credits 45 contact hours 1 term

DESCRIPTION

Professionals in health-allied sciences require knowledge of the principles and concepts of human movement. The ability to identify bones and muscles relevant to human movement demonstrates the ability of physiological and motor analysis of human movement for the different specialties of practical execution in the auxiliary sciences. Identifying, organizing, and analyzing the basic movements regarding the muscular actions that occur in physical activity and exercise is an essential criterion to reduce the risk of injury and prescribe safe exercise. This is a theoretical and practical course.

JUSTIFICATION

Exercise science requires extensive knowledge in the safe, effective, and responsible execution of exercise prescription. Knowing the proper movements requires knowing the fundamentals of movement, correct anatomical identification, and conducting an efficient mechanical analysis of human movement. Safety and effectiveness in prescribing exercise in all populations is imperative. It is the responsibility of all healthcare professionals to correctly identify and plan the appropriate frequency, intensity, amount, and modality of exercise to protect the health of the participants receiving their services.

COMPETENCES

The course develops the following competences in students:

- **Critical questioning**
- **Communication**
- **Ethical sense and social justice**

OBJECTIVES

After completion of the course, students will be able to:

1. Identify the bones involved in human movement.
2. Identify the joints of the human body and their relationship to movement and safety.
3. Analyze the muscle groups responsible for producing human movement, their functions, and aspects related to their safety.
4. Apply the laws of physics to analyze and describe human movement.
5. Perform different mechanical analyses of human movement.
6. Evaluate and apply principles for making exercise prescriptions based on the specific needs of each patient.

CONTENTS

- I. Introduction
 - A. Study of kinesiology
 - B. Auxiliary sciences
 - C. Biomechanics: qualitative vs. quantitative analysis
 - D. Measurement (accuracy vs precision)
- II. Kinematic Concepts
 - A. Movements
 - B. Reference standards
 - C. Joint movement terminology
- III. Kinetic Concepts
 - A. Concepts related to kinetics
 - B. Mechanical loads
 - C. Vectors
- IV. Biomechanics of Bones
 - A. Composition and structure
 - B. Growth and development
 - C. Stress responses
 - D. Injuries
- V. Biomechanics of the Joints
 - A. Architecture

- B. Stability
- C. Flexibility
- D. Injuries
- VI. Biomechanics of Muscles
 - A. Behavioral properties
 - B. Organizational structure
 - C. Neuromuscular function
 - D. Skeletal muscle strength, power, and tolerance
 - E. Injuries
- VII. Biomechanics of the Upper Extremity
 - A. Structure of the shoulder, elbow, and wrist
 - 1. Movements
 - 2. Injuries
- VIII. Biomechanics Of the Lower Extremity
 - A. Structure of the hip, knee, and ankle
 - B. Movements
 - C. Injuries
- IX. Biomechanics of the Spine
 - A. Structure
 - B. Movements
 - C. Muscles
 - D. Injuries
- X. Kinematics and Angular Kinetics
 - A. Angular measurements
 - B. Angular and linear relationships
 - C. Velocity and angular acceleration
- XI. Kinematics and Linear Kinetics
 - A. Acceleration
 - B. Projectiles
 - C. Newton's Laws
- XII. Balance
 - A. Torque
 - B. Levers

- C. Static and dynamic equations
- D. Center of mass

METHODOLOGY

The following strategies from the active learning methodology are recommended:

- Lectures
- Discussions
- Project based learning
- Collaborative learning

EVALUATION

Participation	20%
Compositions	30%
Oral presentation	10%
Partial assignments	40%
Total	100%

LEARNING ASSESSMENT

The institutional assessment rubric is applied to the course's core activity.

BIBLIOGRAPHY

TEXTBOOK

Hamil, J., Knutzen, K. & Derrick, T. (2015). *Biomechanical Basis of Human Movement* (4th ed.). Wolters Kluwer.

REFERENCES

Hall, S. J. (2011). *Basics Biomechanics* (6th ed.). McGraw Hill.

Norkin, C., White, D.J. (2009). *Measurement of Joint Motion: A Guide to Goniometry* (4th ed.). F.A. Davis Company.

Watkins, J. (2018). *Laboratory and Field Exercise in Sport and Exercise Biomechanics*. Routledge.

For more information resources related to the course's topics, access the library's webpage <http://biblioteca.sagrado.edu/>

REASONABLE ACCOMMODATION

For detailed information on the process and required documentation you should visit the corresponding office. To ensure equal conditions, in compliance with the ADA Act (1990) and the Rehabilitation Act (1973), as amended, any student in need of reasonable accommodation or special assistance must complete the process established by the Vice Presidency for Academic Affairs.

ACADEMIC INTEGRITY

This policy applies to all students enrolled at Universidad del Sagrado Corazón to take courses with or without academic credit. A lack of academic integrity is any act or omission that does not demonstrate the honesty, transparency, and responsibility that should characterize all academic activity. Any student who fails to comply with the Honesty, Fraud, and Plagiarism Policy is exposed to the following sanctions: receive a grade of zero in the evaluation and / or repetition of the assignment in the seminar, a grade of F (*) in the seminar, suspension, or expulsion as established in the Academic Integrity Policy effective in November 2022.

All rights reserved | Sagrado | November 2022 | Translated December 2023