

## Global Learning Semesters

### Course Syllabus

Course: BIOL-305 Human Functional Anatomy

Department: Health and Life Sciences

Host Institution: University of Nicosia, Nicosia, Cyprus



Course Summary		
Course Code	Course Title	Recommended Credit Hours
BIOL-305	Human Functional Anatomy	4
Semester Offered	Contact Hours	Prerequisites
Please contact us	42-45	BIOL-150, BIOL-151, BIOL-160, BIOL-161
Department	Level of Course	Language of Instruction
Health and Life Sciences	Upper Division	English

### Course Description

The purpose of this course is to provide the student with a survey of the anatomy of the human body with special attention to the structure and function of the various body system and in particular of the musculoskeletal system. Specifically the course provides the basis for the student to gain an understanding of the basic theories and principles associated with the study of human movement and how body design is related to mechanical function in an evolutionary and comparative context. Upon successful completion of this course (3 h lectures, 3 h lab per week), the student through class presentations; laboratory experiences and formal lab write ups will be able to: understand the basic theory associated with the kinematics and kinetic of human movement, understand and apply the basic principles to analyze human movement and quantitatively assess human movements.

### Prerequisites

BIOL-150, BIOL-151, BIOL-160, BIOL-161

### Topic Areas

1. Origin of chordates, the Vertebrate Story, Biological Design.
2. The Skeletal systems: skull, axial, appendicular.
3. Anatomy of Muscle structure and aspects of muscle Physiology.
4. The respiratory system.
5. The Circulatory System.
6. The Urogenital System.
7. The Nervous system and sensory organs.
8. Functional Anatomy of Support and Locomotion.
9. Mechanical Principles: Kinematics (Position classification, types of motion, joint motion).
10. Mechanical Principles: Kinetics (theories of motion).
11. Muscle Activity and Strength.
12. Neurophysiology of movement.
13. Upper Appendicular muscles, the shoulder complex.
14. Lower Appendicular muscles.
15. Standing and Walking (Postures, gait).

Laboratory Exercises

The laboratory exercises (3h/week) aim to provide the student with a comprehensive overview of the human body with emphasis on the musculoskeletal system and its functions.

1. Organization of the body.
2. Introduction to the skeletal system.
3. Appendicular Skeleton.
4. Osteokinematics, rotary and translatory motion, arthrokinematics.
5. Calculation of muscle and joint forces, applied weights and resistances, stretching vs joint mobilization, pressure).
6. Motor Control.
7. Quantitative measurement of muscle strength.
8. Muscle synergism, antagonism.
9. Muscle synergism, antagonism; prehension.
10. Motion and muscular activity in function.
11. Function of muscles acting on the hip.
12. Joint forces and torque of muscles acting on the knee.
13. Function of lower extremity muscles.
14. Balancing, bending. Lifting, breathing, coughing.
15. Study of locomotion, Gait Cycle.

## Readings and Resources

### Required Textbooks

- Joint Structure and Function: A Comprehensive Analysis by Pamela K. Levangie, Pamela K. Leverage (Editor), Cynthia C. Norkin (Editor) Publisher: F A Davis Co; 3rd edition (January 2001) ISBN: 0803607105.
- Basic Biomechanics of the Musculoskeletal System by Margareta Nordin (Editor), Victor H. Frankel (Editor) Publisher: Lippincott Williams & Wilkins Publishers; 3rd edition (May 2001) ISBN: 0683302477.

### Recommended Reading

- The Human Brain: An Introduction to Its Functional Anatomy by John, Ph.D. Nolte, Mosby Publisher: Mosby; 5th edition (January 15, 2002) ISBN: 0323013201.
- The Johns Hopkins Atlas of Human Functional Anatomy by Leon Schlossberg (Illustrator), George D. Zuidema (Editor), Johns Hopkins University School of Medicine, George D. Zuidema (Editor) Publisher: Johns Hopkins Univ Pr; 4th edition (January 15, 1997) ISBN: 0801856523.
- Functional Anatomy of the Vertebrates: An Evolutionary Perspective by Karel F. Liem (Editor), Warren Walker Publisher: Brooks Cole; 3rd edition (December 18, 2000) ISBN: 0030223695.
- VERTEBRATES: Comparative Anatomy, Function, Evolution, Third Edition by Kenneth Kardong, Publishers: McGraw-Hill, 2001, ISBN: 0-07-290956-0.
- Kinesiology of the Musculoskeletal System by Donald A. Neumann, Donna L. Wong, Frank, Mosby, Inc.; ISBN: 0815163495; 1st edition (March 22, 2002).