

Liverpool John Moores University

Title: BIOMECHANICAL FOUNDATIONS
Status: Definitive
Code: **4006SPOSCI** (114191)
Version Start Date: 01-08-2011

Owning School/Faculty: Sports Sciences
Teaching School/Faculty: Sports Sciences

Team	Leader
Mark Lake	Y

Academic Level: FHEQ4 **Credit Value:** 12.00 **Total Delivered Hours:** 25.00
Total Learning Hours: 120 **Private Study:** 95

Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	16.000
Practical	6.000
Tutorial	2.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	AS1	Practical report	50.0	
Exam	AS2	Multiple choice and short answer exam	50.0	1.00

Aims

The aim of this module is to establish the foundational theory of biomechanics and apply it to the study of the body in a sport and exercise context.

Learning Outcomes

After completing the module the student should be able to:

- 1 Describe sports skills and techniques in mechanical terms.
- 2 Illustrate basic mechanical and biological principles applied to the musculo-skeletal system.
- 3 Solve basic mechanical problems applied to sports skills.
- 4 Explain and Illustrate foundational biomechanical techniques.
- 5 Collect and interpret basic biomechanical data via group experimental work.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Lab report	1	2	3
Multiple choice / short answer	3	4	5

Outline Syllabus

Biomechanics of joint and muscle function.
Physical characteristics of sports skills.
Representation of the human body by a biomechanical model.
Segmental analysis.
Video analysis.
Force analysis.

Learning Activities

Lectures and demonstrations will be central to the student learning experience, where key foundational biomechanical principles and techniques will be explored. Experimental work within the laboratory will enable students to gain hand-on experience of techniques and engage in their own learning.

References

Course Material	Book
Author	Hall, S
Publishing Year	1999
Title	Basic Biomechanics
Subtitle	
Edition	3rd ed.
Publisher	St Louis: McGraw-Hill
ISBN	0070921180

Course Material	Book
Author	Hamill, J. and Knutzen, K.M.

Publishing Year	2003
Title	Biomechanical Basis of Human Movement
Subtitle	
Edition	2nd ed.
Publisher	Baltimore: Williams and Wilkins.
ISBN	0781734053

Course Material	Book
Author	Carr, G.
Publishing Year	2004
Title	Sports Mechanics for Coaches
Subtitle	
Edition	2nd ed.
Publisher	Human Kinetics
ISBN	0736039724

Notes

The module uses lecture and laboratory sessions to develop the students understanding of foundational theory of biomechanics and their ability to apply it to the study of the body in a sport and exercise context. The assessment tasks are designed to evidence the level of understanding and practical skill of the students.

The seventh edition of Basic Biomechanics has been significantly updated from the previous edition. The approach taken remains an integrated balance of qualitative and quantitative examples, applications, and problems designed to illustrate the principles discussed. This edition also retains the important sensitivity to the fact that some beginning students of biomechanics possess weak backgrounds in mathematics. For this reason, it Basic biomechanics research on many popular sport techniques will have been conducted in the early to mid-20th century. Biomechanics research in kinesiology since the 1970s has tended to become more narrowly focused and specialized, and has branched into areas far beyond sport and education. As a result, students with basic sport technique interests now have to integrate biomechanics research over a 50-year period. Depending on the depth of analysis and the human movement of interest, a stu Basic Orthopaedic Biomechanics and Mechano-Biology, 3rd edn (Philadelphia, PA: Lippincott Williams & Wilkins, 2005).

16. C. Murray. Human Accomplishment: The Pursuit of Excellence in the Arts and Sciences, 800 BC to 1950 (New York: HarperCollins, 2003).
These organelles produce most of the basic energy-containing molecules from certain substrates such as glucose. Then these energy-containing molecules are used by other subsystems within the cell. A command center (the nucleus). Biomechanics is a fascinating field. Possessing sufficient knowledge in this area is paramount for properly understanding resistance training. I try my best to educate my readers so that over time they can build upon their knowledge and reach superior levels of understanding with regards to human movement.
Human biomechanics is comprised of three basic disciplines: 1) Mechanics of Human Movement or Movement Biomechanics; 2) Orthopedic Biomechanics; and 3) Fluid Biomechanics.