

Liverpool John Moores University

Title: BIOMECHANICS OF GAIT AND INJURY
Status: Definitive
Code: **6005SPOSCI** (114286)
Version Start Date: 01-08-2011

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

Team	Leader
Gabor Barton	Y

Academic Level: FHEQ6
Credit Value: 24.00
Total Delivered Hours: 50.00
Total Learning Hours: 240
Private Study: 190

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	36.000
Practical	12.000

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Essay	AS2		25.0	
Exam	AS3	Exam	50.0	2.00
Report	AS1		25.0	

Aims

The aim of the course is to provide students with the knowledge of the application of biomechanical principles applied to the study of locomotion and sports injury. Through this course students should develop their knowledge and understanding of biomechanics, clinical gait analysis, and mechanisms of sports injury.

Learning Outcomes

After completing the module the student should be able to:

- 1 Analyse and integrate the biomechanical mechanisms involved in locomotion and sports injuries.
- 2 Critically appraise the current literature in the area.
- 3 Conduct experimental analyses of locomotion.

Learning Outcomes of Assessments

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

Essay	1	2
Exam	1	2
Report	3	

Outline Syllabus

The gait cycle during walking and running.
Three dimensional kinematics.
Three dimensional kinetics.
Electromyography, plantar pressure measurement.
Normal and pathological gait.
Clinical case studies of pathological gait.
Injury surveys and risk factors in running.
Biological adaptations of hard and soft tissues to load.
External forces and shock attenuating mechanisms.
Musculo-skeletal force alignment.
Muscle forces and muscle balance.
The biomechanics of running injuries.
Selected case studies.

Learning Activities

The principal knowledge will be presented in lectures and demonstrations which the students complete with prescribed reading related to the lectures and practicals. The experimental laboratory assignments will give hands on experience with the procedures. The very latest advances of the topic will be covered by a visiting lecture.

References

Course Material	Book
Author	Whittle, M.W.

Publishing Year	2001
Title	Gait Analysis: an introduction
Subtitle	
Edition	
Publisher	Butterworth-Heinemann
ISBN	0750652624

Course Material	Book
Author	Cavanagh, P.R.
Publishing Year	1990
Title	Biomechanics of Distance Running
Subtitle	
Edition	
Publisher	Human Kinetics
ISBN	0873222687

Course Material	Book
Author	Harris, G.F. & Smith, P.A.
Publishing Year	1996
Title	Human Motion Analysis: Current Applications and Future Directions
Subtitle	
Edition	
Publisher	I.E.E.E. Press
ISBN	0780311116

Course Material	Book
Author	Bartlett, R.
Publishing Year	1999
Title	Sports Biomechanics: reducing injuries and improving technique
Subtitle	
Edition	
Publisher	E & F N Spon.
ISBN	0419184406

Course Material	Book
Author	Whiting, W.C and Zernicke, R.F.
Publishing Year	1998
Title	Biomechanics of musclo-skeletal injury
Subtitle	
Edition	
Publisher	Human Kinetics
ISBN	0873227794

Course Material	Book
Author	Zatsiorsky, V.

Publishing Year	2000
Title	Biomechanics in sport: Performance enhancement and injury prevention
Subtitle	
Edition	
Publisher	Blackwell Science
ISBN	0632053925

Course Material	Book
Author	Gage, J.R.
Publishing Year	2004
Title	The treatment of gait problems in cerebral palsy
Subtitle	(with CD-ROM)
Edition	
Publisher	London, Mac Keith
ISBN	1898683379

Course Material	Book
Author	Perry, J
Publishing Year	1992
Title	Gait analysis
Subtitle	normal and pathological function
Edition	
Publisher	Thorofare, NJ, Slack
ISBN	1556421923

Course Material	Book
Author	Gage, J.R.
Publishing Year	1991
Title	Gait analysis in cerebral palsy
Subtitle	
Edition	
Publisher	Mac Keith, 1991
ISBN	0901260908

Notes

The aim of the course is to provide students with the knowledge of the application of biomechanical principles applied to the study of locomotion and sports injury. Through this course students should develop their knowledge and understanding of biomechanics, clinical gait analysis, and mechanisms of sports injury.