

## Liverpool John Moores University

Title: TECHNICAL TRAINING IN BIOMECHANICS  
Status: Definitive  
Code: **7023SPOSCI** (114331)  
Version Start Date: 01-08-2014

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

Team	Leader
Mark Robinson	Y
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**Academic Level:** FHEQ7      **Credit Value:** 20.00      **Total Delivered Hours:** 24.00  
**Total Learning Hours:** 200      **Private Study:** 176

### Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Practical	20.000
Tutorial	4.000

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Portfolio	Report 1	Laboratory report (1500 words)	50.0	
Report	Report 2	Laboratory report (1500 words)	50.0	

### Aims

*The aim of this module is to provide technical training in laboratory techniques appropriate to sport and exercise biomechanics.*

*The module will provide the opportunity for students to develop laboratory skills so that they are able to collect and interpret biomechanical data to benchmark standards.*

## Learning Outcomes

After completing the module the student should be able to:

- 1 Establish quality control indices for biomechanical measurement.
- 2 Conduct laboratory based protocols according to benchmark standards.
- 3 Demonstrate expertise in validity and reliability as applied to biomechanical techniques.

## Learning Outcomes of Assessments

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

Lab report 1	1	2	3
Lab report 2	1	2	3

## Outline Syllabus

1. *2D motion analysis and data smoothing*
2. *3D Optoelectronic motion analysis*

- *data collection training*
- *reconstruction accuracy*
- *QTM data processing*
- *high speed kinematics*

3. *Kinetics (reliability and validity)*

4. *Combining Kinetics and Kinematics  
Inverse Dynamics*  
– *training on VISUAL3D modelling*

5. *Collect complete 3D movement analysis data (Regression & Correlation)*

## Learning Activities

This module provides two hours of direct contact per week. Almost all sessions will be in the lab working hands on with biomechanics equipment. In addition to taught classes, an independent activity will be set each week. These activities will be used to (a) develop independent skills related to content of that week's class, (b) prepare data collection to feed into subsequent classes and assessments, and (c) serve as data for analysis in other modules (specifically Research Methods).

## References

<b>Course Material</b>	Book
<b>Author</b>	Payton, C. & Bartlett, R.
<b>Publishing Year</b>	2008
<b>Title</b>	Biomechanical evaluation of movement in sport and exercise: The BASES guidelines
<b>Subtitle</b>	
<b>Edition</b>	
<b>Publisher</b>	Routledge
<b>ISBN</b>	

<b>Course Material</b>	Book
<b>Author</b>	Grimshaw, P., Lees, A., Fowler, N. & Burden, A.
<b>Publishing Year</b>	2006
<b>Title</b>	Sport and Exercise Biomechanics
<b>Subtitle</b>	
<b>Edition</b>	
<b>Publisher</b>	Taylor & Francis, New York
<b>ISBN</b>	

<b>Course Material</b>	Book
<b>Author</b>	Robertson, D. G. E, Caldwell, G., Hamill, J., Kamen, G and Whittlesey, S. N. .
<b>Publishing Year</b>	2004
<b>Title</b>	Research methods in Biomechanics.
<b>Subtitle</b>	
<b>Edition</b>	
<b>Publisher</b>	Human Kinetics: Champaign, Illinois.
<b>ISBN</b>	

<b>Course Material</b>	Book
<b>Author</b>	Winter, D.A.
<b>Publishing Year</b>	2009
<b>Title</b>	Biomechanics and motor control of human movement
<b>Subtitle</b>	
<b>Edition</b>	
<b>Publisher</b>	Wiley, New Jersey
<b>ISBN</b>	

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## Notes

This module provides an opportunity to focus onto the detailed use of biomechanical techniques. Aspects of the advanced methodology in force and motion analysis will be visited.

This module is fundamental to the collection of high quality experimental data in biomechanics, which feeds directly into the independent research project for the MSc

thesis.