

Liverpool John Moores University

Title: ADVANCED BIOMECHANICAL TECHNIQUES
Status: Definitive
Code: **7014SPOSCI** (114311)
Version Start Date: 01-08-2011

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

| Team | Leader |
|-----------|--------|
| Mark Lake | Y |

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 2

| Component | Contact Hours |
|-----------|---------------|
| Lecture | 12.000 |
| Practical | 12.000 |

Grading Basis: 40 %

Assessment Details

| Category | Short Description | Description | Weighting (%) | Exam Duration |
|--------------|-------------------|---|---------------|---------------|
| Report | AS1 | Laboratory report and oral defence (1500 words) | 50.0 | |
| Presentation | AS2 | Laboratory report and oral defence (1500 words) | 50.0 | |

Aims

The aim of this module is to provide technical training in advanced laboratory techniques appropriate to sport and exercise biomechanics so that the student is able to apply these techniques in the collection and interpretation of data for research purposes.

Learning Outcomes

After completing the module the student should be able to:

- 1 Critically appraise key equipment and data collection issues associated with advanced techniques such as electromyography and accelerometry.
- 2 Conduct laboratory based protocols with more advanced biomechanical techniques according to benchmark standards.
- 3 Demonstrate expertise in advanced processing and interpretation of signals in the time and frequency domains.

Learning Outcomes of Assessments

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

| | | | |
|-----------------------------|---|---|---|
| Lab report and oral defence | 1 | 2 | 3 |
| Lab report and oral defence | 1 | 2 | 3 |

Outline Syllabus

1. *Signal processing*
2. *Electromyography*
3. *Pressure measurement*
4. *Accelerometry*

Learning Activities

Students will be required to attend lectures and practicals to develop their ability to conduct advanced biomechanical measurement and protocols to benchmark standards. This should be supplemented by prescribed reading that will facilitate the completion of the coursework tasks.

References

| | |
|------------------------|--|
| Course Material | Book |
| Author | Bartlett, R. |
| Publishing Year | 1997 |
| Title | Biomechanical Assessment of Movement in Sport and Exercise |
| Subtitle | |
| Edition | |
| Publisher | British Association of Sport and Exercise Sciences |
| ISBN | |

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|------------------------|---------------------------------|
| Course Material | Book |
| Author | Dainty, D. A. and Norman, R. W. |

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|------------------------|--|
| Publishing Year | 1987 |
| Title | Standardizing biomechanical testing in sport |
| Subtitle | |
| Edition | |
| Publisher | Human Kinetics |
| ISBN | |

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|------------------------|--|
| Course Material | Book |
| Author | Robertson, D. G. E, Caldwell, G., Hamill, J., Kamen, G and Whittlesey, S. N. |
| Publishing Year | 2004 |
| Title | Research Methods in Biomechanics |
| Subtitle | |
| Edition | |
| Publisher | Human Kinetics |
| ISBN | 0-7360-3966-X |

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|------------------------|--|
| Course Material | Book |
| Author | Winter, D. A. |
| Publishing Year | 2005 |
| Title | Biomechanics and motor control of human movement |
| Subtitle | |
| Edition | |
| Publisher | John Wiley & Sons |
| ISBN | 0-471-44989-X |

Notes

This module provides an opportunity to focus on the detailed use of advanced biomechanical techniques. Aspects of the advanced methodology in electromyography, pressure measurement and accelerometry analysis will be visited.