**Liverpool** John Moores University

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| Title: | BIOMECHANICAL PRINCIPLES |
| Status: | Definitive |
| Code: | **7028SPOSCI** (114337) |
| Version Start Date: | 01-08-2011 |
| Owning School/Faculty: | Sports Sciences |
| Teaching School/Faculty: | Sports Sciences |

| Team | Leader |
|---|---|
| Jos Vanrenterghem | Y |

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| **Academic Level:** | FHEQ7 | **Credit Value:** | 20.00 | **Total Delivered Hours:** | 40.00 |
| **Total Learning Hours:** | 200 | **Private Study:** | 160 | | |

**Delivery Options**
Course typically offered: Semester 1

| Component | Contact Hours |
|---|---|
| Lecture | 24.000 |
| Tutorial | 16.000 |

**Grading Basis:** 40 %

**Assessment Details**

| Category | Short Description | Description | Weighting (%) | Exam Duration |
|---|---|---|---|---|
| Practice | AS1 | open book assessment on problem solving in biomechanics | 20.0 | |
| Technology | AS2 | open book assessment on laboratory methods in biomechanical research specific to gait and posture | 20.0 | |
| Essay | AS4 | Essay on contemporary best practise for one methodological aspect in gait and posture research (1500 words) | 40.0 | |
| Report | AS3 | open book assessment on biomechanical data interpretation | 20.0 | |

**Aims**

*The aim of this module is to provide theory and training on biomechanical principles related to laboratory techniques that are relevant to biomechanics of gait and posture, 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:

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| 1 | Establish mastery of biomechanical evaluation of gait and posture |
| 2 | Conduct advanced laboratory protocols using contemporary methodologies |
| 3 | demonstrate expertise in validity and reliability issues specifically applied to biomechanical principles of measuring gait and posture |

## Learning Outcomes of Assessments

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

| | | | |
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| problem solving | 1 | | |
| lab methods | 1 | 2 | |
| 1500 words | 1 | 2 | 3 |
| data interpretation | 3 | | |

## Outline Syllabus

*1. Advanced dynamics*
*2. Advanced kinematics*
*3. Contemporary methods (pressure, EMG, isokinetics)*
*4. Inverse dynamics and advanced kinetics*
*5. Validity and reliability in posture and gait research*

## Learning Activities

Students will attend lectures, tutorials and practicals to develop mastery in conducting advanced biomechanical investigation in the context of gait and posture analysis, and this through using contemporary methodologies. This is supplemented by guided reading activities that will facilitate critical reflection for the completion of the coursework tasks.

## References

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| **Course Material** | Book |

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| **Author** | Griffiths, Iwan W. |
| **Publishing Year** | 2006 |
| **Title** | Principles of Biomechanics and Motion Analysis |
| **Subtitle** | |
| **Edition** | |
| **Publisher** | Lippincott Williams & Wilkins |
| **ISBN** | 0-7817-5231-0 |

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|---|---|
| **Course Material** | Book |
| **Author** | Robert, T.D.M. |
| **Publishing Year** | 1995 |
| **Title** | Understanding balance |
| **Subtitle** | The mechanics of posture and locomotion |
| **Edition** | |
| **Publisher** | Chapman and Hall |
| **ISBN** | 0412601605 |

**Notes**

This module provides an opportunity to gain advanced knowledge and skills on biomechanical principles in the context of the evaluation of gait, posture and balance. It allows the student to explore different pathways to approach biomechanical issues.