

Module code: MOD010994	Version: 1 Date Amended: 05/Nov/2025
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1. Module Title
Functional Anatomy and Biomechanics of Equine Movement

2a. Module Leader
Lauren Hunt

2b. School
Writtle School of Agriculture, Animal and Environmental Sciences

2c. Faculty
Faculty of Science and Engineering

3a. Level
5

3b. Module Type
Standard (fine graded)

4a. Credits
30

4b. Study Hours
300

5. Restrictions			
Type	Module Code	Module Name	Condition
Pre-requisites:	None		
Co-requisites:	None		
Exclusions:	None		
Courses to which this module is restricted:	BSc Equine Therapy, rehabilitation and performance, BSc Animal Therapy, rehabilitation and performance, BSc Canine Therapy rehabilitation and performance. MVetphys Veterinary Physiotherapy, Canine and Equine.		

LEARNING, TEACHING AND ASSESSMENT INFORMATION

6a. Module Description
In this module, you'll be provided with a thorough understanding of the neuromusculoskeletal conditions in equines, including common tissue dysfunctions and their effects on movement. You'll be introduced to movement theories and various biomechanical analysis techniques specifically applied to equine locomotion. You'll learn to analyse the different types of motion in equines, discussing the anatomical and mechanical factors that influence movement, from gait to posture. Also considering the impact of jumping kinematics observing anatomical and mechanical factors that influence movement, from stride to take-off, flight phase and landing. The knowledge you gain will be applied to equines in various settings, combining theoretical learning with practical sessions. You'll explore the link between tissue assessment (such as muscle tone, joint health, and soft tissue condition) and how these factors affect a horse's ability to move efficiently and comfortably while considering the various disciplines and their required movements.
6b. Outline Content

MUSCULOSKELETAL TISSUE:

This section covers the equine musculoskeletal system, including the axial and appendicular skeleton, muscle origins and insertions, and joint structures. Students will explore both the function and dysfunction of these tissues, and the stages of tissue healing and tensile strength during recovery. Surface anatomy will also be assessed, building on prior knowledge from Animal Anatomy and Physiology.

NEUROMUSCULOSKELETAL TISSUE STATE AND DYSFUNCTION:

Students will investigate how dysfunctions in neuromusculoskeletal tissues affect equine locomotion and posture, with an emphasis on how these conditions impact movement efficiency and comfort.

MECHANICAL MODELS OF LEGGED LOCOMOTION

This section covers mechanical models of equine locomotion, including the inverted pendulum model for walking and the spring-mass model for running, helping students understand how horses use biomechanics across different gaits.

KINEMATICS AND KINETICS

Students will apply mechanical principles to equine movement, focusing on kinematics (movement patterns) and kinetics (the forces involved), with a particular focus on how these affect gait and performance.

ENERGETICS

This section explores the energetic cost of movement in horses, including the power, energy consumption, and work done during various gaits and activities, and how fitness impacts performance.

GAIT ANALYSIS METHODS

Students will learn to evaluate equine gait using a range of methods, from visual assessment to advanced tools, to analyse movement patterns and identify potential issues in locomotion. The use of data collection equipment, software and development of IT skills to ensure digital literacy.

6c. Key Texts/Literature

The reading list to support this module is available at: <https://readinglists.aru.ac.uk/>

6d. Specialist Learning Resources

Super lab and dissection specimens

7. Learning Outcomes (threshold standards)		
No.	Type	On successful completion of this module the student will be expected to be able to:
1	Knowledge and Understanding	Develop a comprehensive understanding of functional anatomy and musculoskeletal tissue state in relation to equine biomechanical movement.
2	Knowledge and Understanding	Interpret the changes in tensile strength of tissues across different stages of the healing process, assessing the implications for equine rehabilitation.
3	Intellectual, practical, affective and transferrable skills	Use their theoretical knowledge of anatomic structure to assess horses, identifying adaptations tissue states and dysfunction.
4	Intellectual, practical, affective and transferrable skills	Appraising Equine motion through kinematics, kinetics, and energetics, and using tools for movement evaluation, essential for performance.
5	Intellectual, practical, affective and transferrable skills	Evaluate observational skills informed by quantitative biomechanical data to develop equine assessment protocols.

8a. Module Occurrence to which this MDF Refers				
Year	Occurrence	Period	Location	Mode of Delivery
2026/7	ZZF	Template For Face To Face Learning Delivery		Face to Face

8b. Learning Activities for the above Module Occurrence			
Learning Activities	Hours	Learning Outcomes	Details of Duration, frequency and other comments
Lectures	48	1-5	2hr Theory per week.
Other teacher managed learning	24	1-5	1hr Practical/workshop/seminar
Student managed learning	228	1-5	Independent directed learning
TOTAL:	300		

9. Assessment for the above Module Occurrence

The assessment for some modules includes a presentation (see below for details on how this particular module is assessed). We recognise that presenting, especially to a large group, can cause significant anxiety or distress for some students. If this may affect you, please contact your Module Leader or the Disability and Neurodiversity Service as early as possible. We will work with you to consider appropriate reasonable adjustments. Depending on your individual needs, these might include, for example, presenting to a smaller group or presenting only to a member of academic staff.

Assessment No.	Assessment Method	Learning Outcomes	Weighting (%)	Fine Grade or Pass/Fail	Qualifying Mark (%)
010	Examination	1-3	30 (%)	Fine Grade	30 (%)

Coursework: In-class test

Assessment components for Element 010

Component No.	Assessment Title	Submission Method	Weighting (%)	Components needed for Mark Calculation?
010/1	MCQ 1		33 (%)	All
010/2	MCQ 2		33 (%)	
010/3	MCQ 3		34 (%)	

Assessment No.	Assessment Method	Learning Outcomes	Weighting (%)	Fine Grade or Pass/Fail	Qualifying Mark (%)
011	Coursework	4,5	70 (%)	Fine Grade	30 (%)

Coursework

Assessment components for Element 011

Component No.	Assessment Title	Submission Method	Weighting (%)	Components needed for Mark Calculation?
011/1	Narrated video 15 min		40 (%)	All
011/2	Report 2000 words		60 (%)	

In order to pass this module, students are required to achieve an overall mark of 40% (for modules at levels 3, 4, 5 and 6) or 50% (for modules at level 7*).

In addition, students are required to:

- (a) achieve the qualifying mark for each element of fine graded assessment as specified above**
- (b) pass any pass/fail elements**

[* the pass mark of 50% applies for all module occurrences from the academic year 2024/25 – see Section 3a of this MDF to check the level of the module and Section 8a of this MDF to check the academic year]