**Syllabus**
**Basic Biomechanics - Understanding Horse Movement**

"Biomechanics is the science of movement of a living body, including how muscles, bones, tendons and ligaments work together to produce movement."

**Required Books:**

- **Horse Gaits, Balance, and Movement** by Susan Harris, 2016
- **The Horse's Muscles in Motion** by Sara Wyche, 2002

**Introduction:**
This is a beginning course in equine biomechanics that will be of interest to horse owners, trainers, 4H or FFA students, veterinary technicians, and individuals involved with the care and development of the horse. The pure study of biomechanics involves quite a bit of mathematics and physics. This course will not go into that level of detail, but is of a depth that will be of great interest while also being understandable for the layperson.

It will cover:

- A basic understanding of the gaits of the horse
- Review of horse structure and anatomy
- Breed specific gaits
- Qualities of movement
- Understanding the action of the muscles
- The effects of shoeing on movement
- Rider effects on movement

**Course Duration:**
This is a self-paced independent study course. It must be started within 3 months of sign-up and completed within 12 months. There will be no tuition refunds. If a student desires to drop the course within the first 30 days, they may be eligible to receive a 50% refund upon written request. Extensions may be granted at the discretion of Avalon Performance Horse and Rider Support upon request by the student.

**Assignments, Tests, and Grading:**
• The course is divided into five sections. Each section has a quiz at the end.
• You do not need to have access to horses to take this course, but your experience will be enriched if you can observe them in action.
• Each quiz must be passed with a score of 70% or better in order to proceed to the next work assignment. By the end of the course, section quiz scores will be averaged to arrive at a final course grade of **A** (≥90%), **B** (≥80%), **C** (≥70%), or **Incomplete** (meaning not all sections were passed within 12 months) The course grade will be given as a percentage.
• A student with an incomplete may re-take the course by re-registering and paying for the course.

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**Estimated Time Commitment and Equivalence to Credit Hours**
This course contains five sections with an estimated time commitment of 60 hours of study and exercises plus quizzes for a total time commitment of 75 hours, equivalent to 7.5 CEUs or 4 credit hours.

**Course Objectives:**
1. Upon completion of the course, the student will have developed a good understanding of the basic equine gaits as well as breed specific gait characteristics.
2. The student will have an understanding of the muscular action on the skeleton to produce movement.
3. The student will have an understanding of rider actions that work both with and against the horse's physical structure and balance.
4. The student will have an understanding of how external factors such as how a horse is shod or the fit of the tack can work with or against the horse's physical structure and balance.

**Course content:**

**Section 1 – Laying the Foundation for Understanding Movement**
- Reading Assignment:
  - Horse Gaits, Balance, and Movement:
    - Chapter 1 - Why Learn About Gaits, Balance, and Movement
    - Chapter 2 - Basic Structure and Anatomy
    - Chapter 3 - How a Horse Moves: The Cycle of Movement
  - The Horse's Muscles in Motion:
    - Chapter 1 – Introducing Anatomy
    - Chapter 2 – The Frame: Bones, Joints and Ligaments
- Section 1 Learning Activity
- Section 1 Quiz

**Section 2 – Understanding the Gaits**
- Reading Assignment:
  - Horse Gaits, Balance, and Movement:
    - Chapter 4 - The Gaits and Transitions
    - Chapter 5 - Gaited Horses and Ambling Gaits
    - Chapter 6 - Types of Movement
    - Chapter 7 - Gait Qualities and Good Movement
- Section 2 Learning Activity
- Section 2 Quiz

**Section 3 – Muscles and Movement**

Reading Assignment:

Horse Gaits, Balance, and Movement:

Chapter 8 - Balance and Movement

Chapter 9 - Flexion, Bending, and Straightness

Chapter 10 - Lateral Movements

The Horse's Muscles in Motion:

Chapter 3 – The Driving Forces: Muscles, pgs 36-73

Section 3 Learning Activity

Section 3 Quiz

**Section 4 – Recognizing Limitations in Movement**

Reading Assignment:

Horse Gaits, Balance, and Movement:

Chapter 11 - Faulty Movement

Chapter 12 - Conformation and Movement

The Horse's Muscles in Motion:

Chapter 3 – The Driving Forces: Muscles, pgs 74-114

Section 4 Learning Activity

Section 4 Quiz

**Section 5 - Rider Effects on Movement**

Reading Assignment:

Horse Gaits, Balance, and Movement:

Chapter 13 - Shoeing and Movement

Chapter 14 - The Effect of the Rider on the Horse's Movement

Chapter 15 - Getting the Best Movement from Your Horse

Section 5 Learning Activity

Section 5 Quiz