BIKE FITTING COURSE

Online Course Outline

The scientific foundation for the practical course

MODULES	LESSONS	INCLUDES	LEADS INTO
4	10	Exercises and knowledge checks	The in-person practical course

The online course provides the scientific foundation for the practical course. It introduces a structured way to understand how a rider moves, why their position may produce a particular response, and how forces pass between the rider and bicycle.

The course contains four modules and ten lessons.

COURSE MAP

A Understanding the moving rider

- A1 Movement and functional anatomy
- A2 Muscle architecture and mechanical role
- A3 Motor control, proprioception and coordination

B Regional function, loading and professional scope

- B1 Joint function across the cyclist
- B2 Tissue loading and symptom awareness
- B3 Symptom history, scope and referral

C Forces and biomechanical interpretation

- C1 Forces, vectors, torque and joint moments
- C2 Torque–angle and force–velocity relationships
- C3 Pedal force, joint power and inverse dynamics

D Integrating the framework

- D1 Integrated case and readiness assessment

MODULE A

A. Understanding the moving rider

A1 Movement and functional anatomy

Bike fitting begins with describing movement accurately. This lesson establishes the anatomical language needed to discuss a rider's position and movement without confusing observations with explanations.

Topics include joint and segment movement, anatomical reference systems, movement in three dimensions and the limitations of motion-capture measurements.

A2 Muscle architecture and mechanical role

Muscles cannot be understood simply by looking at which joint they cross. Their structure, length, contraction conditions and relationship with neighbouring muscles all influence their potential role.

This lesson explores how muscle architecture affects force production and why the same muscle may behave differently across different cycling positions and tasks.

A3 Motor control, proprioception and coordination

A rider's movement pattern reflects how the nervous system organises the whole task, rather than the isolated action of individual muscles.

This lesson examines coordination, sensory information, movement variability and fatigue. It also considers what observed movement can and cannot tell a fitter about the rider's underlying strategy.

B

MODULE B

Regional function, loading and professional scope

B1 Joint function across the cyclist

No joint works independently during cycling. A change at the foot, pelvis or upper body can alter movement elsewhere in the system.

This lesson examines the rider as a linked mechanical system and develops a framework for recognising compensation without automatically treating it as a fault.

B2 Tissue loading and symptom awareness

Symptoms cannot be understood from position alone. Training exposure, tissue capacity, recovery and sensitivity all influence how a rider responds to load.

This lesson introduces a practical framework for considering common cycling presentations while avoiding unsupported diagnoses or overly simple mechanical explanations.

B3 Symptom history, scope and referral

Before changing a bike, the fitter must decide whether fitting experimentation is appropriate and what information is needed to proceed safely.

This lesson covers structured symptom histories, screening, reversible testing, communication, follow-up and the boundary between bike fitting and clinical care.

C. MODULE C
Forces and biomechanical interpretation

C1 Forces, vectors, torque and joint moments

Visible movement shows what happened, but it does not reveal the forces responsible for it.

This lesson introduces the mechanical concepts needed to interpret pedal forces, reaction forces, torque and joint moments. It also establishes the difference between something measured directly and something calculated or inferred.

C2 Torque–angle and force–velocity relationships

A joint angle does not have one fixed meaning. Changes in position can alter muscle length, leverage, movement velocity and the contribution of surrounding structures.

This lesson explains why commonly used fitting angles should be treated as operating conditions rather than universal targets, and how position and cadence can affect a rider's capacity to produce force.

C3 Pedal force, joint power and inverse dynamics

Pedalling-analysis systems can produce impressive quantities of data, but each output answers a specific question and rests on particular assumptions.

This lesson develops the skills needed to interpret pedal-force direction, mechanical effectiveness, net joint moments and joint power without treating them as direct measurements of individual muscles, tissues or injury risk.

MODULE D

D. Integrating the framework

D1 Integrated case and readiness assessment

The final lesson brings the course together through a complete rider case.

Students organise the available evidence, identify competing explanations, choose appropriate tests and decide what conclusions the evidence can support. This creates the bridge between the online material and the practical course.

Course structure

The online course includes:

- Four modules
- Ten lessons
- Applied cycling examples
- Interpretation exercises and knowledge checks
- A final integrated case

NEXT: THE IN-PERSON COURSE

The practical course builds on this foundation through rider assessment, measurement, equipment trials and structured fitting experiments.

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