### WHAT TO KNOW FROM THE TOPICS:

### Motor learning and coaching

Effective instruction and coaching is explored through appropriate skill practices, and the design of strategic and tactical challenges. Content includes:

* roles and leadership styles for the effective management of training and coaching sessions
* analysis of learning and skill development to improve performance
* information processing during skill performance
* the design of effective instruction and provision of feedback
* teaching strategies and techniques to improve skill execution
* analysis of performance.

### Functional anatomy

Knowledge of functional anatomy provides a foundation for the development of a biomechanical understanding of movement. Content includes:

* the structure and function of the musculoskeletal systems
* the structure and function of the circulatory, respiratory and neuromuscular systems
* production of movement.

### Biomechanics

**Note: No calculations required**

Observation, description and biomechanical analysis of movement are underpinned by movement principles and concepts. Content includes:

* biomechanical principles, concepts and laws of motion
* analysis of movement
* application of biomechanical principles to improve the quality of movement.

### Exercise physiology

Students study physiological capacities and the influence of energy systems to improve performance in physical activity and structured training. Content includes:

* examination of the physiological capacities (metabolic, cardio-respiratory and neuromuscular)
* knowledge of the body’s circulatory and respiratory systems as an essential basis for exploring performance potential and preparedness for participation
* nutrition to meet the energy demands of participation in different activities and environmental conditions
* principles of training
* training types to improve components of fitness
* key characteristics of training program design and evaluation
* immediate and extended care of the injured athlete.

### Sport psychology

The development of mental skills is recognised as being essential to improving performance and facilitating positive group dynamics. Content includes:

* application of group dynamics theories/models and understandings
* skills and processes associated with goal setting, stress management, visualisation, concentration and motivation
* regulation of self-imagery and arousal levels
* influence of varying groups on mental skill preparation (age, skill level, and type of activity).

# UNIT 3

### Motor learning and coaching

* definition of transfer of learning
* categories of transfer of learning
  + skill to skill
  + theory to practice
  + training to competition
* effects of transfer of learning
  + positive
  + negative
  + zero effects
* impact of positive, negative and zero effects of transfer of learning on skill execution and movement efficiency
* analyse movement skills of self and others to identify errors, provide feedback and suggest corrections to improve performance
* design coaching/training activities to improve performance in selected skills, including [shaping](http://www.revision-notes.co.uk/revision/66.html), chaining, static-dynamic, simple-complex
* use of different leadership styles – democratic, authoritarian and laissez-faire to suit audience needs.

### Functional anatomy

* structure of skeletal muscle
  + epimysium
  + fascicle
  + perimysium
  + muscle fibre
  + myofibril
* the role of myosin, actin and the sarcomere in sliding filament theory
* relationship between the velocity and duration of muscle contraction to the amount of force exerted by the contraction
  + force–velocity
  + force–length

### Biomechanics

**Note: No calculations required**

* definition of momentum and how it applies to a selected sport
  + conservation of momentum (Newton’s Second Law of Motion)
  + impulse–momentum relationship
  + coefficient of restitution
* definition and application of the following concepts in a set sport
  + moment of inertia
  + angular momentum
  + levers
  + three classes of levers
* relationship between torque and the use of levers in sport: torque = force x perpendicular distance of lever arm
* application of biomechanical principles to analyse physical skills
  + balance
  + coordination continuum
  + force-motion
  + force-time
  + inertia
  + optimal projection
  + range of motion
  + segmental interaction
  + spin

### Exercise physiology

* relationship between energy demands and nutritional requirements during physical activity
  + phases of activity – pre-competition, during exercise, recovery
  + nutritional considerations – balanced diet, glycemic index, fats, proteins, carbohydrates, fluid replacement
* implications of preparing and performing in varying environmental conditions
  + heat/humidity
  + altitude
  + cold
* physiological changes brought on by the use of performance enhancers
  + protein powders
  + anabolic steroids
  + stimulants

### Sport psychology

* mental skills strategies used pre, during and post-performance, to manage stress, motivation, concentration, self-confidence and arousal levels
  + self-talk
  + relaxation
  + performance routines
  + goal-setting
  + imagery

# UNIT 4

### Motor learning and coaching

* use checklists and video to analyse and reflect on the performance of themselves and others in physical activity
* learning and skill development in relation to correction and improvement of self and others
  + use of video analysis
  + reflective journals
  + peer/mentor/coach feedback
  + questionnaires

### Functional anatomy

* function of the nerves, spinal cord, motor unit (dendrite, axon, neuron)
* relationship between muscle contraction and nerve function
* characteristics of fast and slow twitch fibres and their relationship to physical performance types   
  (sprint, endurance)
  + Type I
  + Type IIa
  + Type IIb

### Biomechanics

**Note: No calculations required**

* definitions of fluid, laminar and turbulent flow
* definitions of pressure drag (form drag), surface drag (skin friction) and wave drag and how they apply to sporting contexts
* Bernoulli’s principle - effect of shape and pressure differential
* changes in flight paths in spinning balls–the Magnus effect in relation to
  + top spin
  + back spin
  + side spin
  + no spin

### Exercise physiology

* training programs designed to improve performance in relation to:
  + [periodisation](http://www.trainingsmartonline.com/swimming_and_triathlon_periodisation.php): micro cycle, macro cycle, pre-season, in-season, off-season
  + specific energy system requirements
  + [peaking](http://www.eis2win.co.uk/gen/news_peaking.aspx)
  + [overtraining](http://physiotherapy.curtin.edu.au/resources/educational-resources/exphys/00/overtraining.cfm)
  + injured athletes
  + [tapering](http://www.nswis.com.au/ArticleDocuments/234/Tapering.pdf)
  + recovery
  + maintenance

### Sport psychology

* Carron’s model of group cohesion
  + the relationship between social loafing and group cohesion
  + the influence of social loafing on individual and group performance
  + strategies to improve group cohesion
  + factors affecting group cohesion
    - environmental
    - leadership
    - personal
    - team