

## **Final Exam Review**

### **Unit 1: Anatomy and Physiology**

#### Chapter 5: The Skeletal and Articular Systems Overview

- Know the anatomical positions, planes and axes
- Be able to describe the movements of joints
- Know the role and 5 main functions of the Skeletal System
- Know the 5 types of bones
- Know what the axial and appendicular skeletons are
- Know the anatomy of a long bone
- Know what fractures are and examples
- Be able to discuss the effects of aging on the Skeletal System
- Be able to label diagrams of the following (pages 130 – 142):
  - Anterior and posterior views of the human skeleton
- Know specific bone landmarks and muscle origins and insertions
- Know the structural classifications of joints and their classification based on anatomical groupings
- Know the 6 types of synovial joints and characteristics of them
- Know the different types of injuries and how to treat them.
- Know specifics about shoulder, knee and ankle injuries

#### **Chapter 6: The Muscular System**

- Know the three types of muscle tissue
- Know the components and functions of the musculoskeletal system
- Know what agonist and antagonist muscles are and some examples of common sets
- Know what the origin, insertion and function of major muscles and muscle groups.
- Know the structure of skeletal muscle
- Understand how the neuromuscular system works and its components
- Know how the nervous system controls movement
- Know some common muscle and tendon injuries
- Be able to describe the sliding filament theory and the role of Calcium and ATP
- Be able to discuss the action of Excitation-Contraction Coupling (pg's 180 – 181)
- Understand how the reflex arc works
- Know what proprioceptors are and what they do
- Know what the stretch and tension reflex is and what is associated with it.
- Understand the stretch reflex Unit 1: Anatomy and Physiology

#### **Chapter 7: Energy Systems and Physical Activity**

- Know the three types of key energy nutrients and their relative energy levels.
- Know the role of carbohydrates in the body
- Know the structure of ATP and its importance
- Know the 2 different systems in the body that utilize ATP: Anaerobic and aerobic
- Know the three metabolic pathways

- Understand the ATP-PC system and how/when it works
- Know some examples of activities that would utilize this system
- Know the process of glycolysis.
- Know how pyruvate gets converted to lactic acid
- Know some examples of activities that would rely on this system
- Understand the process of cellular respiration and its components; Glycolysis, Krebs' Cycle and Electron Transport Chain.
- Know some examples of activities that would rely on this system
- Know the difference between slow twitch and fast twitch muscles
- Know the importance of myoglobin
- Know how the 3 different muscle types utilize energy and the processes each use
- Understand how the different muscle groups affect training for specific activities and be able to give examples.

### **Chapter 8: The Cardiovascular and Respiratory Systems**

- Know what cardiac output, heart rate, blood pressure and blood flow distribution are
- Understand the difference between External and Internal respiration
- Know what the conductive and respirator zones are.
- Know what occurs during changes in pulmonary ventilation, external respiration and internal respiration.
- Know what  $a\text{-VO}_2$  difference is.
- Know some common respiratory diseases
- Know what  $\text{VO}_2$  Max is how its measured
- Understand what Oxygen Deficit is and when it occurs
- Understand what blood lactate accumulation is.

### **Unit 2: Human Performance and Biomechanics**

Human Development Powerpoint

### **Chapter 10: Motor Learning and Skill Acquisition**

- Know what motor learning is
- Know the role of the sensory and nervous systems in skill acquisitions
- Know the stages of motor learning model
- Know the phases of movement for skill development
- Understand the role of feedback in skill performance
- Know the 5 steps in improving skill performance
- Know what sport psychology is
- Understand what the ideal performance state i

## **Chapter 11: Biomechanical Theory and Concepts**

- Know what biomechanics is
- Know the role of internal and external forces
- Know the first law of motion and examples in sports where it applies
- Know the second law of motion and examples in sports where it applies
- Know how to use and answer questions using  $F = ma$
- Know the third law of motion and examples in sports where it applies
- Know the 3 classes of levers and examples in the body
- Know what linear or translational motion is and examples in sports
- Know what Angular (rotational) motion is and examples of human physical activities that involve it.
- Understand what determines which type of motion is occurring
- Know what torque is
- Understand the role of ergonomics
- Be able to explain the role of biomechanics in injury prevention and rehabilitation

## **Chapter 12: The Seven Principles of Biomechanics**

- Understand the nature of static systems
- Understand the nature of dynamic systems
- Know principle 1 of biomechanics
- Understand how Mas, Centre of Mass, Base of Support and Position of Centre of Mass all related to stability
- Understand principle 2 the production of maximum effort and how it applies to biomechanics
- Understand principle 3 sequencing of joint rotation and how it applies to biomechanics
- Understand principle 4 the impulse-momentum relationship.
- Know how principle 4 can be applied to sports
- Understand principle 5 the direction in which movement usually occurs (think Newton's third law)
- Understand principle 6 the effect of a force acting at some distance from an axis.
- Know what the angle of insertion is.
- Know how principle 6 can be applied to sports
- Understand principle 7 the conservation of angular momentum
- Know how to apply principle 7 and examples from sports.
- Know what the law of conservation of angular momentum is.
- Be able to calculate biophysical questions similar to the unit test

## Unit 3: Nutrition, Training and Ergogenic Aids

### Chapter 14: Nutrition for Human Performance

- Know what a macronutrients
- Know what dietary carbohydrates are and be able to give examples
- Know what dietary proteins are and be able to give examples
- Know what dietary fats are and be able to give examples
- Know why water is important
- Understand why trans fats are considered to be harmful
- Know micronutrients are
- Know some common vitamins and what they do in the body (table 14.2 pg. 381)
- Know some common minerals and what they do in the body (table 14.2 pg. 381)

*Be able to read and understand food labels*

- Understand what a calorie is
- Understand what a daily caloric need is
- Know what BMR and RMR are.
- Understand the general rules regarding losing body fat without hindering RMR
- Know the set-point theory
- Understand the three macromolecule requirements for optimal performance
- Understand the timing of nutritional intake for athletes

### Chapter 15: Training and Human Performance

- Know what the F.I.T.T. Principle is and how to apply it to training
- Know the different types of functional fitness and examples of each
  - Periodization, flexibility training, core training, cardiorespiratory training, resistance training, circuit and stage training, plyometrics training, speed/agility/quickness training and balance training.
- Know the 3 stages of a sound training program
- Understand the 2 different types of training programs; health-related and performance-related

### Chapter 16: Ergogenic Substances and Techniques

- Understand the importance and risks of product knowledge with regards to dietary supplementation such as; vitamin, minerals, proteins and caffeine.
- Know what pharmacological and physiological aids are and examples of them
- Know some examples of technological aids
- Know some examples of ergogenic improvements