

SUBJECT NAME: Human Exercise Physiology

SUBJECT DESCRIPTION

The subject content covers the acute and chronic effects of exercise on various body systems, including the integumentary, skeletal, muscular, nervous, cardiovascular, lymphatic, respiratory, digestive, urinary, endocrine, and reproductive systems, with a focus on the muscular system responses to physical activity and work in health and performance.

CONTENT COVERED

- Cellular and whole-body bioenergetics and metabolism
- Muscle physiology, including task demand, muscle fibre typing, motor unit recruitment
- Physiology of work, including pre-employment screening
- Cardiovascular physiology, including cardiac output changes and blood flow redistribution
- Pulmonary physiology, including gas exchange, functional volumes, and airflow rates
- Muscle physiology, including adaptations in motor unit and fibre type recruitment in relation to demand task
- Acute physiological responses to exercise, including cardiopulmonary changes from rest to exercise, energy system contributions, central and peripheral fatigue, and environmental effects on acute exercise (hypoxia, thermal stress)
- Chronic physiological adaptations to exercise, including phenotypical adaptations, as well as detraining
- The role of exercise physiology research in health and wellness
- Physiological measurement techniques for assessing health and fitness,
- Risk management considerations and the adverse effects of exercise

KEY PERFORMANCE INDICATORS (KPIs)

1. Understands the acute physiological responses to exercise.
2. Understands the chronic adaptations that occur with targeted and regimented exercise.
3. Understands the distinct demands and biochemistry of the energy systems.
4. Understands how the human body adapts to environmental factors.
5. Understands and can explain the cardiac, vascular, respiratory, neurologic, and metabolic adaptations to regular exercise training.
6. Describes the physiological adaptations that result from different types of exercise, including the effects and mechanisms of detraining and deconditioning.
7. Understands the mechanisms by which aerobic and resistance training methods enhance physical performance.
8. Explains how exercise can result in fatigue, muscle damage, and dehydration.
9. Considers and utilizes functional knowledge of the respiratory system, including the mechanics of quiet breathing, regulation of airway resistance, and gas composition and exchange in practice.
10. Understands the role exercise physiology plays in prevention and treatment of chronic diseases.
11. Determines appropriate client risk management strategies to mitigate the occurrence of adverse events during exercise.
12. Explains the body's response and adaptation to exercise and occupational work.
13. Understands and recognizes how body systems respond and function in different environments (e.g., hot, cold, altitude).
14. Competently evaluates a client's cardiorespiratory fitness.

15. Develops and implements a plan to alter functional ability to achieve desired outcomes based on outcome of cardiorespiratory fitness evaluation.