

Exercise Prescription & Physiology 490050

Exercise Prescription & Physiology is a one-credit course that provides an overview of the principles of exercise testing and prescription based on current practices in physical education, physiology, and rehabilitation for normal, healthy individuals, and special populations. Course is designed to provide students with a basic understanding of laboratory and field assessment techniques used in exercise physiology, fitness and wellness facilities, and clinical situations. Instruction provided on the measurement and evaluation of muscular strength, anaerobic and aerobic fitness, cardiovascular and respiratory function, flexibility, and body composition.

Career and technical student organizations are integral, co-curricular components of each career and technical education course. These organizations serve as a means to enhance classroom instruction while helping students develop leadership abilities, expand workplace-readiness skills, and broaden opportunities for personal and professional growth.

Students will:

1. Explain the concepts of exercise physiology, sports nutrition, sports psychology, and trace their origin.
 1. Define exercise physiology, sports nutrition, sports psychology, and bioenergetics.
 2. Evaluate the philosophy of exercise in the United States.
 3. Discuss related career options (e.g. exercise physiologist, exercise psychologist, certified personal trainer, dietician, nutritionist).
2. Evaluate the use of bioenergetic principles pertaining to human motor performance, exercise physiology, and sports nutrition.
 1. Analyze biological energy systems and the limiting factors in exercise performance (e.g. aerobic versus anaerobic, oxygen uptake, metabolic specificity of training).
 2. Explain the effects of motor and chemical functions encountered in exercise physiology, sports nutrition, and the basic terminology involved (e.g. exercise metabolism, hormonal response, energy expenditure, temperature).
3. Analyze performance strategies related to exercise physiology.
 1. Demonstrate proper use of exercise strategies (e.g. isometric, isotonic, isokinetic).
 2. Demonstrate proper techniques for stretching and warm-up.
 3. Assess muscular strength, endurance, and power.
 4. Demonstrate how to improve muscular strength, endurance, speed, agility, and power (e.g. resistance training and plyometrics).
 5. Utilize appropriate safety procedures in the weight room, athletic field, and exercise lab (e.g. exercise technique, spotting, and progressions).
4. Investigate the relationship between body systems as it relates to exercise physiology and nutrition.
 1. Evaluate circulatory responses during aerobic and anaerobic training exercises.
 2. Evaluate respiration during aerobic and anaerobic training exercises.

3. Investigate adaptations to aerobic and anaerobic training as it relates to neural, muscular, connective tissue, and endocrine response.
4. Investigate the bioenergetics of a predetermined nutrition plan and regulate exercise metabolism.
5. Apply concepts of exercise physiology to the design of physical conditioning exercises.
 1. Examine flexibility and range of motion.
 2. Evaluate girth, skinfolds, and body mass index.
 3. Determine resting and exercise blood pressure.
 4. Assess energy expenditure and power required to perform an activity.
 5. Evaluate maximum oxygen uptake during an activity.
6. Investigate age and gender-related differences and their implications for resistance training.
 1. Examine differences in exercise response (e.g. children, older adults).
 2. Differentiate between training adaptations for male versus female athletes.
7. Examine performance enhancing substances used in today's exercise performance programs.
 1. Compare various types of performance enhancing substances (e.g. steroids, HGH, blood doping to increase hemoglobin).
 2. Compare various types of dietary supplements (e.g. vitamins, herbal medicines, protein supplements).
8. Analyze nutritional factors associated with health and sports performance.
 1. Identify the roles of nutritional factors (e.g. macronutrients, micronutrients, fluid, and electrolytes).
 2. Demonstrate how to evaluate the adequacy of prescribed diet.
 3. Examine common eating disorders in exercise performance (e.g. anorexia nervosa, anorexia athletica, bulimia nervosa, use of appetite suppressants).
9. Analyze the concepts of periodization in training and conditioning.
 1. Explain the principles of test selection and administration for designing an exercise program.
 2. Explain the different program cycles and periods of an exercise program.
 3. Design an exercise program for a client using the appropriate parameters (e.g. exercise selection, frequency, volume, intensity, recovery).
 4. Utilize safety measures and injury prevention during training and conditioning.
10. Investigate the evolution of safety technology and critique its progress.
 1. Compare various types of preventative measures in sports nutrition (e.g. adequate total energy intake, glycogen restoration, hydration, iron status).
 2. Discuss the safety standards and legal concerns of performance enhancing substances and dietary supplements.

3. Understand safety policies implemented throughout sports which aim to protect participants from high risk nutritional injury (e.g. iron deficiency, low bone mineral density).
4. Examine biomedical research which continues to improve the quality of nutrition education.
5. Explain appropriate documentation protocols.