

**HPE 373
PHYSIOLOGY OF EXERCISE**

INSTRUCTOR - Bennett G. Edwards, PhD, RKT, ATC

OFFICE HOURS:- M-W-F 9:00 – 11:00 AM
T-TH 3:00 – 4:00 PM

TEXTBOOKS - W.D. McArdle, [F.I. Katch. V.I. Katch](#) Exercise Physiology. Philadelphia: Lea & Febiger Publishers. 2001 (required). D. Dubin. Rapid Interpretation of EKG's, 4th Edition [C.O.V.E.R. Publishers](#) 2002 (Optional)

Classroom Decorum

To enhance the learning atmosphere of the classroom, students are expected to behave in a fashion conducive to learning in the classroom. More specifically, students will refrain from disruptive classroom behavior (i.e., talking to classmates, disrespectful responses to teacher instructions; swearing, wearing clothes that impede academic learning such as but not limited to, wearing body revealing-clothing, and excessively baggy pants; hats/caps, and/or headsets). Students will turn off telephones prior to entering the classroom. Students who exhibit the behaviors described above, or similar behaviors will immediately be removed from class at the third documented offense. The student will be readmitted to class only following a decision by the department chair. The student may appeal the decision of the department chair to the Dean of the College offering the course, and, subsequently, to the Office of the Vice President of Academic Affairs, and then to the President of Shaw University. The decision of the President will be final. Failure to follow the procedure herein outlined will result in termination of the appeal, and revert to the decision of the department chair. Each behavior construed by the instructor as non-productive will be reported, properly documented and reported to the student, and the chair of the academic department offering the course. The report shall be in written form with a copy for the student, department chair, and faculty member. Additional student behavior guides may be found in Student Affairs

COURSE DESCRIPTION

Students will be introduced to dynamic models of human physiology. Models will include aerobic exercise and anaerobic exercise and their effects on the (1) cardiovascular, (2) pulmonary, (3) endocrine, (4) muscular, (5) digestive, and (6) nervous systems of the body. Emphasis will be placed on energy metabolism and energy substrate utilization. The effects of environmental stressors such as altitude, depth, heat and cold on human physiology will also be discussed. The effects of age, gender, and race on physical performance will also be explored.

GENERAL OBJECTIVES

To help students understand the relationship between diet/nutrition and exercise performance. Enable students to understand the scientific bases of various training regimes. To identify the adaptations and adjustments to exercise. To recognize normal and abnormal cardiopulmonary function tests. To help students avoid dangers presented by environmental stressors. To help students develop exercise prescriptions for various populations such as athletes, elderly and disabled populations.

Exercises will be consistent with the Scope of Practice of cardiac rehabilitation and exercise physiology as it relates to the ethical treatment of clients in clinical and non-clinical environments.

Week-1 Students will be able to calculate and convert energy costs of running, walking, treadmill, bicycle ergometry, cycling, and arm ergometry in terms of oxygen consumption and calories.

Week-2 Metabolic Calculations Non-EKG stress test end points

Week-3 Metabolic Calculations. Phase I, II, and III cardiac rehabilitation

Week-4 Metabolic Calculations. Phase III cardiac rehabilitation and general conditioning. Review & Exam

Week-5 Carbohydrates; monosaccharides, disaccharides, polysaccharides. Cholesterol, triglycerides, omega-3 fatty acids, free fatty acids, saturated fats, monosaturated fats, polyunsaturated fats
Week-6 proteins, amino acids, and peptides. Vitamin, minerals, water. (crucial nutrition)

Week-7 Krebs's cycle, ATP, ADP, CP, glycolytic cycle, electron cycle, beta oxidation cycle

Week-9 Energy substrate utilization according to exercise intensity and duration. Blood glucose, gluconeogenesis, glycolysis, glycogenolysis, and glycogen

Week-9 Carbohydrate loading Eating for optimal athletic performance. High fat and protein diets; carbohydrate diets, low caloric diets. Food groups, vegetarian diets. Diet, performance, and diabetes type II

Week-10 Review of diet, nutrition, natural performance enhancers and Krebs's cycle

Week-11 Students will identify and describe the significant parts of a normal Electrocardiogram (EKG). Students will identify life threatening EKG abnormalities. Cardiac risk factors, EKG end points for exercise and stress testing. Cardiac, skeletal, and smooth muscles

Week-12 Students will describe the effects of Berger, Delorme, Isometric, Brief Maximal Exercise, and Functional Isometrics on strength gains. Effects of circuit training

Week-13 Students will identify the parts of a normal pulmonary function test (esp. Functional vital capacity (FVC) and Forced Expiratory Volume/1 second (FEV₁s). Restrictive and obstructive pulmonary disease

Week-14 Buffering system; metabolic acidosis, metabolic alkalosis, respiratory acidosis and respiratory alkalosis Renal and pulmonary compensation, acid-base balance

Week-15 Students will describe exercise precautions to be taken when prescribing exercise for elderly and obese individuals.

Week - 16 The effects of temperature, pressure, and acidity on the oxygen dissociation curve. Effects of altitude and depth on physical performance

EVALUATION

Exam #1- Metabolic Calculations

Exam #2- Nutrition and Diet

Exam # 3-Cardiopulmonary Function, EKG's

Exam #4- Comprehensive Exam

*Course may be modified to meet the needs and/or knowledge base of students