KIN 310
Physiological Bases of Physical Activity
Fall 2007

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Time and location: 12:40-2:00 PM
M, T, W, Th 05/14 – 06/28
IM Circle RM 126

Course website: https://angel.msu.edu

Course description: Acute and chronic effects of exercise on various body systems. Principles of training, exercise prescription, and the role of physical activity in health and disease.

Prerequisites: KIN 170, PSL 250, CEM 141, KIN 216 OR PSL 431, 432

Course Objectives:
1. The student will understand the physiological bases of the *responses* and *adaptations* to exercise.
2. The student will understand methods of measuring and quantifying physical performance and fitness.
3. The student will demonstrate the ability to integrate knowledge of physiology and evaluation to prescribe exercise based on performance and/or fitness goals.

Textbook: Wilmore and Costill, Physiology of Sport and Exercise. Human Kinetics. Third Edition

Lecture Schedule:

Weeks 1: Metabolism & Basic Energy Systems

Weeks 2: Energy Expenditure & Exercise

     05.30 = Exam #1

Week 3: Neuromuscular Control of Movement

Week 4: Pulmonary System

     06.11 = Exam #2

Week 5: Cardiovascular System, Cardiovascular Disease

Week 6: Endocrinology, Physiology of Aerobic & Strength Training

     06.20 = Exam #3

Week 7: Body Composition, Environmental Factors & Exercise

     ***06/28* FINAL EXAM (cumulative) **

Grading plan:

Exam #1:	100 points
Exam #2:	100 points
Exam #3:	100 points
Quizzes:	50 points
Final (cumulative):	150 points
Total points	*500*

Grading scale:

4.0	465-500 points (93-100%)
3.5	425-464 (85-92%)
3.0	400-424 (80-84%)
2.5	375-399 (75-79%)
2.0	350-374 (70-74%)
1.5	325-349 (65-69%)
1.0	300-324 (60-64%)
0.0	< 299 (60%)

Attendance policy: Attendance for this class is not mandatory. However, students are responsible for all course material and information from the lectures. Students are also responsible for obtaining all the information concerning changes in exams, lectures, etc. given in class.

Academic fraud: Cheating, plagiarism, or any other form of academic fraud will result in a 0.0 grade for this course.

Missed quizzes/exams: In general, quizzes and exams cannot be made up. However, arrangements can be made with the instructor to take exams at different times if an absence is unavoidable due to emergencies, varsity sports participation, etc. *These arrangements must be made BEFORE THE TEST and are SUBJECT TO THE INSTRUCTOR'S APPROVAL.*

CAATE Competencies and proficiencies covered in this class:

NU-C4 Identify nutritional considerations in rehabilitation, including nutrients involved in healing and nutritional risk factors (e.g., reduced activity with the same dietary regimen and others).

NU-C5 Describe common illnesses and injuries that are attributed to poor nutrition (e.g., effects of poor dietary habits on bone loss, on injury, on long-term health, and on other factors).

NU-C6 Explain energy and nutritional demands of specific activities and the nutritional demands placed on the patient.

NU-C7 Explain principles of nutrition as they relate to the dietary and nutritional needs of the patient (e.g., role of fluids, electrolytes, vitamins, minerals, carbohydrates, protein, fat, and others).

NU-C18 Describe the principles and methods of body composition assessment (e.g., skinfold calipers, bioelectric impedance, body mass index [BMI]) to assess a patient's health status and to monitor progress in a weight loss or weight gain program for patients of all ages and in a variety of settings.

NU-C19 Explain the relationship between basal metabolic rate, caloric intake, and energy expenditure in the use of the Food Pyramid Guidelines.

NU-P1 Assess body composition by validated technique (e.g., skinfold calipers, bioelectric impedance, BMI, etc.) to assess a patient's health status and to monitor progress during a weight loss or weight gain program.

NU-P2 Calculate energy expenditure, caloric intake, and BMR.

NU-CP1 Demonstrate the ability to counsel a patient in proper nutrition. This may include providing basic nutritional information and/or an exercise and nutrition program for weight gain or weight loss. The student will demonstrate the ability to take measurements and figure calculations for a weight control plan (e.g., measurement of body composition and BMI, calculation of energy expenditure, caloric intake, and BMR). Armed with basic nutritional data, the student will demonstrate the ability to develop and implement a pre-participation meal and an appropriate exercise and nutritional plan for an active individual. The student will develop an active listening relationship to effectively communicate with the patient and, as appropriate, refer the patient to other medical professionals (physician, nutritionist, counselor or psychologist) as needed.

RM-C1 Explain the risk factors associated with physical activity.

RM-C5 Describe the basic concepts and practice of wellness screening.

RM-C8   Explain the principles of effective heat loss and heat illness prevention programs. Principles include, but are not limited to, knowledge of the body's thermoregulatory mechanisms, acclimation and conditioning, fluid and electrolyte replacement requirements, proper practice and competition attire, and weight loss.

RM-C11   Explain the importance and use of standard tests, test equipment, and testing protocol for the measurement of cardiovascular and respiratory fitness, body composition, posture, flexibility, muscular strength, power, and endurance

RM-C12   Explain the components and purpose of periodization within a physical conditioning program

RM-C13   Identify and explain the various types of flexibility, strength training, and cardiovascular conditioning programs. This should include the expected effects (the body's anatomical and physiological adaptation), safety precautions, hazards, and contraindications of each.

PA-C2   Explain gross cellular adaptations in response to stress, injury, or disease (e.g., atrophy, hypertrophy, differentiation, hyperplasia, metaplasia, and tumors).

PA-C3   Explain normal and abnormal circulation and the physiology of fluid homeostasis.

PA-C4   Identify the normal acute and chronic physiological and pathological responses (e.g., inflammation, immune response, and healing process) of the human body to trauma, hypoxia, microbiologic agents, genetic derangements, nutritional deficiencies, chemicals, drugs, and aging affecting the musculoskeletal and other organ systems, and musculoskeletal system adaptations to disuse.

PA-C6   Describe the body's responses to physical exercise during common diseases, illnesses, and the injury.

DI-C1   Demonstrate knowledge of the systems of the human body.

DI-C2   Describe the anatomical and physiological growth and development characteristics as well as gender differences across the lifespan.

DI-C3   Describe the physiological and psychological effects of physical activity and their impact on performance.

MC-C8   Explain the importance and proper use of a peak flowmeter or similar device in the evaluation and management of respiratory conditions.

EX-C4d   The physiological adaptations induced by the various forms of therapeutic exercise, such as fast- versus slow-twitch muscle fibers

EX-C4e   The physiological responses of additional factors, such as age and disease