

KINES 81 Course Outline as of Fall 2021**CATALOG INFORMATION**

Dept and Nbr: KINES 81 Title: INTRO TO EXERCISE PHYSIO

Full Title: Introduction to Exercise Physiology

Last Reviewed: 2/26/2024

| Units | | Course Hours per Week | | Nbr of Weeks | Course Hours Total | |
|---------|------|-----------------------|------|--------------|--------------------|-------|
| Maximum | 3.00 | Lecture Scheduled | 2.50 | 17.5 | Lecture Scheduled | 43.75 |
| Minimum | 3.00 | Lab Scheduled | 1.50 | 5 | Lab Scheduled | 26.25 |
| | | Contact DHR | 0 | | Contact DHR | 0 |
| | | Contact Total | 4.00 | | Contact Total | 70.00 |
| | | Non-contact DHR | 0 | | Non-contact DHR | 0 |

Total Out of Class Hours: 87.50

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

Catalog Description:

This course examines the human physiological responses and adaptations to the acute stress of exercise and the chronic stress of physical training.

Prerequisites/Corequisites:**Recommended Preparation:**

Eligibility for ENGL 100 or ESL 100 or equivalent

Limits on Enrollment:**Schedule of Classes Information:**

Description: This course examines the human physiological responses and adaptations to the acute stress of exercise and the chronic stress of physical training. (Grade Only)

Prerequisites/Corequisites:

Recommended: Eligibility for ENGL 100 or ESL 100 or equivalent

Limits on Enrollment:

Transfer Credit: CSU;

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

| | | | | | |
|----------------------|----------------------|------------|-----------|------------|-----------|
| AS Degree: | Area | | | Effective: | Inactive: |
| CSU GE: | Transfer Area | | | Effective: | Inactive: |
| IGETC: | Transfer Area | | | Effective: | Inactive: |
| CSU Transfer: | Transferable | Effective: | Fall 2010 | Inactive: | |
| UC Transfer: | | Effective: | | Inactive: | |

CID:

Certificate/Major Applicable:

Both Certificate and Major Applicable

COURSE CONTENT

Student Learning Outcomes:

At the conclusion of this course, the student should be able to:

1. Identify, differentiate, and interpret credible sources of information for research in the field of exercise physiology.
2. Describe the principles of exercise training and adaptation on the skeletal muscles, nervous system, cardiorespiratory system, body composition, metabolism, environmental conditions, and fatigue.

Objectives:

At the conclusion of this course, the student should be able to:

1. Evaluate the source and credibility of reports of scientific experiments in exercise physiology and related topics.
2. Recognize the principles that govern the development of muscular strength and endurance.
3. Comprehend the role of metabolism, bioenergetics, and energy expenditure in varying levels of exercise intensity and at rest.
4. Describe the structure and function of the nervous system as it relates to neural control of human movement.
5. Define body composition and its relationship to recommended weight and sport and exercise participation.
6. Assess cardiorespiratory responses in aerobic and anaerobic exercise for sport and exercise participation.
7. Relate general principles and adaptations of aerobic, anaerobic, and resistance training to exercise training regimens.
8. Identify the physiological responses to various environmental conditions (i.e. higher altitude, heat, and cold).
9. Identify and analyze the various ergogenic agents used that can physiologically affect exercise and sport performance.

Topics and Scope:

- I. Introduction to Exercise and Sport Physiology - Research in Exercise Physiology
 - A. Scientific method
 - B. Experimental design

- C. Credibility of information sources
- II. Structure and Function of Exercising Muscle
 - A. Functional anatomy of skeletal muscle
 - B. Skeletal muscle and exercise
 - C. Muscular endurance and strength testing
- III. Fuel for Exercising Muscle: Metabolism and Bioenergetics
- IV. Neural Control of Exercising Muscle
 - A. Structure and function of the nervous system
 - B. Motor control and reflex activity
- V. Energy Expenditure and Fatigue
 - A. Measuring energy expenditure at rest and during exercise
 - B. Estimation of daily caloric requirements
 - C. Fatigue and its causes
- VI. Cardiovascular System
 - A. Heart, vascular system, and blood
 - B. Sub-max and Maximal cardiovascular testing
 - C. Graded exercise testing
 - D. Lactate threshold testing
- VII. Respiratory System
 - A. Pulmonary ventilation, volumes, and diffusion
 - B. Transport of oxygen and carbon dioxide in the blood
 - C. Gas exchange at the muscles
- VIII. Cardio Respiratory Responses to Acute Exercise
 - A. Cardiovascular responses to acute exercise
 - B. Respiratory responses to acute exercise
 - C. Heart rate and blood pressure testing
- IX. Principles of Exercise Training
 - A. Terminology and general principles of training
 - B. Resistance, anaerobic, and aerobic training programs
- X. Adaptations to Resistance Training
 - A. Gains in muscular fitness
 - B. Muscle soreness
 - C. Resistance training for sex and age differences
- XI. Adaptations to Aerobic and Anaerobic Training: Specificity and Cross-training
- XII. Exercise in Hot and Cold Environments
 - A. Body temperature regulation
 - B. Physiological responses, health risks, and acclimation in the heat
 - C. Physiological responses, health risks, and acclimation in the cold
- XIII. Exercising at Altitude
 - A. Physiological responses to acute altitude exposure
 - B. Exercise and sport performance at altitude
 - C. Acclimatization at prolonged exposure at altitude
- XIV. Body Composition
 - A. Body composition in sport
 - B. Hydrostatic weighing, skinfold, and bioelectrical impedance
- XV. Ergogenic Aids
 - A. Researching ergogenic aids
 - B. Pharmacological agents
 - C. Hormonal agents
 - D. Physiological agents
- E. Nutritional Agents

All topics are covered in the lecture and lab portions of the course.

Assignment:

Lecture-Related Assignments:

1. Read an average of 20-30 pages per week of text and laboratory material
2. Read 1-3 research articles and write brief, typed 1-3 page summaries for each article
3. Exams (2 - 4): multiple choice, true/false, completion, and short essay

Lab-Related Assignments:

1. Perform labs, assess and tabulate data collected

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Written homework, Research Article Summaries

Writing
10 - 35%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Data tabulation and assessment

Problem solving
5 - 15%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Lab assignments

Skill Demonstrations
10 - 35%

Exams: All forms of formal testing, other than skill performance exams.

Exams

Exams
40 - 70%

Other: Includes any assessment tools that do not logically fit into the above categories.

Participation and Attendance

Other Category
5 - 15%

Representative Textbooks and Materials:

Physiology of Sport and Exercise. 7th ed. Kenney, W. Larry and Wilmore, Jack and Costill, David. Human Kinetics. 2019 (classic)

Instructor Prepared materials