

Physiology of Exercise (KINE 442)
Course Outline, Fall 2022

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Course Description

This course is designed to investigate acute responses, and chronic adaptations to the stimulus of exercise. This topic will be examined from metabolic, neuromuscular, cardiovascular, and respiratory perspectives. Implications for enhanced health and physical performance will be included. An understanding of basic physiological processes under resting conditions is assumed.

Course Objectives

At the completion of this course, students will demonstrate an understanding of:

- 1) bioenergetic pathways and how they respond to exercise
- 2) the stress that exercise imparts to the cardiovascular system, and how that system responds/adapts to exercise
- 3) the integration of the ventilatory and cardiovascular responses to exercise
- 4) the effects of exercise on the neuromuscular system
- 5) thermoregulatory responses/adaptations to exercise
- 6) the impact of exercise on health
- 7) quantitative methods used in exercise physiology

Required Textbook

Exercise Physiology, McArdle, W.D., F.I. Katch, and V.L. Katch, 8th edition, Williams and Wilkins (2015).

Course Evaluation

Final grades will be based on the following:

Exam #1 = 25%

Exam #2 = 25%

Exam #3 (finals week) = 25%

Lab average = 25%

* Please inform Prof Burnet, and/or me if you have any medical contraindications for participation in lab exercises

Schedule for Lecture Topics

- 1) History, and evolution of exercise physiology (Introduction)
- 2) Energy value of food (ch 4)
- 3) Energy transfer in the body (ch 6)
- 4) Energy transfer in exercise (ch 7)
- 5) Measurement of human energy expenditure (ch 8)
- 6) Human energy expenditure during rest and physical activity (ch 9)
- 7) Energy expenditure during walking, jogging, and swimming (ch 10)
- 8) Individual differences and measurement of energy capacities (ch 11)

EXAM #1

- 9) Biological sex differences (no book readings)
- 10) Exercise and thermal stress (ch 25)
- 11) Cardiovascular system (ch 15 and ch 16 pp. 336-339 "Integrative Response During Physical Activity")
- 12) Functional capacity of the cardiovascular system (ch 17)
- 13) Gas exchange and transport (ch 13)
- 14) Dynamics of pulmonary ventilation (ch 14)

EXAM #2

- 15) Skeletal muscle fiber types (ch 18 pp. 374-381)
- 16) Nerve supply to muscle (ch 19 pp. 391-405)
- 17) Adaptations of muscle to resistance training (ch 22 pp. 499-515)
- 18) Training for anaerobic and aerobic power (ch 21)
- 19) Obesity and weight control (ch 30)
- 20) Body composition assessment (ch 28)