UNIVERSITY COLLEGE of the FRASER VALLEY

COURSE IMPLEMENTATION DATE: January 2001
COURSE REVISED IMPLEMENTATION DATE: September 2007
COURSE TO BE REVIEWED: November 2009
(Four years after UPAC final approval date) (MONTH YEAR)

OFFICIAL COURSE OUTLINE INFORMATION

Students are advised to keep course outlines in personal files for future use.
Shaded headings are subject to change at the discretion of the department and the material will vary - see course syllabus available from instructor

FACULTY/DEPARTMENT: **KINESIOLOGY AND PHYSICAL EDUCATION**

KPE 362		**3**
COURSE NAME/NUMBER	FORMER COURSE NUMBER	UCFV CREDITS

Theoretical Exercise Physiology
COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

This course discusses the physiological response to exercise, examining both the acute and chronic adaptations to an exercise stress. Discussed from a physiological systems perspective, this course will examine the functional capacity of individual physiological systems discussing the system=s response to submaximal and maximal exercise and its impact on human performance. The environmental impact on physical performance will also be discussed.

PREREQUISITES: **KPE 163 and KPE 270.**
Note: As of September 2008, 54 university-level credits and admission to the Bachelor of Kinesiology degree or Kinesiology minor (or instructor's permission) will also be required.
COREQUISITES: **None**
PRE OR CO REQUISITE: **KPE 370**

SYNONYMOUS COURSE(S)
(a) Replaces: **N/A** *(Course #)*
(b) Cannot take: **N/A** *(Course #)* for further credit.

SERVICE COURSE TO: *(Department/Program)* *(Department/Program)*

TOTAL HOURS PER TERM: **45**
STRUCTURE OF HOURS:

Lectures:	**33**	Hrs
Seminar:		Hrs
Laboratory:		Hrs
Field Experience:		Hrs
Student Directed Learning:	**4**	Hrs
Other: Calculation	**8**	Hrs

TRAINING DAY-BASED INSTRUCTION
LENGTH OF COURSE:
HOURS PER DAY:

MAXIMUM ENROLLMENT: **36**
EXPECTED FREQUENCY OF COURSE OFFERINGS: **Once annually**

WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only)	☐ Yes	☐ No
WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department)	☐ Yes	☒ No
TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:	☐ Yes	☒ No

AUTHORIZATION SIGNATURES:

Course Designer(s): G. Anderson
Chairperson: *(Curriculum Committee)*
Department Head: G. Anderson
Dean: J. Snodgrass
UPAC Approval in Principle Date:
UPAC Final Approval Date: Mar. 30, 2007

LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:

Upon successful completion of this course, students will be able to describe the acute and chronic adaptations of bodily systems to submaximal and maximal exercise. Specifically, students will:

a. understand the control of and regulation of metabolic pathways during exercise

b. understand the process of recovery from exercise

c. be able to calculate work, power, maxV)2, and respiratory volumes

d. be able to describe the physiological response to submaximal exercise

- neuromuscular, cardiovascular, respiratory, and humoral response

e. understand the functional capacity of the physiological systems and their impact on human performance

f. understand the influence of the environment on human performance

METHODS:

Lecture

Small Group Review

Case Studies (calculations)

PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

Credit can be awarded for this course through PLAR (Please check:) ☒ Yes ☐ No

METHODS OF OBTAINING PLAR:

1. Articulated transfer credit
2. Challenge exam
3. Portfolio assessment

TEXTBOOKS, REFERENCES, MATERIALS:

[Textbook selection varies by instructor. An example of texts for this course might be:]

Powers and Howley (2000). Exercise Physiology (4th ed.). Brown and Benchmark; Dubuque, Iowa.

Selected Readings

SUPPLIES / MATERIALS:

STUDENT EVALUATION:

[An example of student evaluation for this course might be:]

Midterm (2)	20%
Case Studies (calculations) (10)	30%
Final exam	50%

COURSE CONTENT:

[Course content varies by instructor. An example of course content might be:]

1. Introduction of Exercise Physiology

1.1 historical perspective

1.2 homeostasis: dynamic

2. Bioenergetics

2.1 control of bioenergetics:
- 2.1.1 phosphagens
- 2.1.2 glycolysis
- 2.1.3 mitochondrial respiration

2.2 exercise metabolism
- 2.2.1 rest-to-exercise transition
- 2.2.2 intensity and duration
- 2.2.3 fuel utilization and selection

2.3 recovery from exercise

3. Measurement of Energy, Work and Power

3.1 ergometry
- 3.1.1 calculation of work during treadmill and cycle ergometry

3.2 measurement of energy expenditure

3.3 caloric equivalent of oxygen

3.4 exercise efficiency

4. Nervous Control of Human Movement

4.1 review sensory information and somatic motor control

4.2 nervous system and motor control

5. The Muscular System

5.1 motor unit
- 5.1.1 gradation of force
- 5.1.2 muscle fibre type
- 5.1.3 force-velocity relationship

5.2 muscle fatigue

6. Pulmonary Ventilation

6.1 review of mechanics and pressure gradients

6.2 standard lung volumes
- 6.2.1 STPD
- 6.2.2 BTPS
- 6.2.3 calculations

6.3 gas analysis for detection of the anaerobic threshold

6.4 respiratory exchange ratio

6.5 respiratory limitations to exercise

7. Cardiovascular System

7.1 review the cardiac cycle and blood flow

7.2 hemodynamics

7.2.1 calculation of total peripheral resistance, cardiac output, application of the Fick equation

7.3 circulatory response to exercise
- 7.3.1 acute and chronic adaptations in response to submaximal exercise

7.3.2 acute and chronic adaptations in response to maximal exercise

7.4 maximal oxygen consumption

7.4.1 calculation of work and oxygen cost

7.4.2 calculation of efficiency

8. Acid-Base Regulation

8.1 acid-base buffering system

8.2 respiratory involvement

9. Exercise and the Environment

9.1 heat and cold

9.2 altitude

9.3 pollution