

I. COURSE DESCRIPTION:

This course is the first part of a two part series (Applied Exercise Physiology I and II). This course examines the physiological adaptations that take place within the human body during exercise and work including the muscular, nervous, endocrine, cardiovascular, and respiratory systems. Bioenergetics and physiological adaptations to training will also be discussed.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. Apply knowledge of basic anatomy and physiology concepts to determine how the body adapts anatomically and physiologically during exercise

Potential Elements of the Performance:

- Recall knowledge from each of the following body systems; muscular, nervous, cardiovascular, respiratory, and endocrine systems
- Indicate, discuss and give examples of how exercise affects the muscular, nervous, cardiovascular, respiratory, and endocrine systems
- Define different types of contraction; i.e. concentric, eccentric, isometric and apply these contractions to various exercises
- Define and differentiate the types of muscle fibers i.e. Type I & II and give examples of activities that recruit each fiber type.
- Describe the role of the Muscle Spindle and Golgi Tendon in controlling muscle contractions
- Identify hormones that are involved during exercise and explain their specific actions.
- Describe the functions of the heart and identify changes to the cardiovascular system as it relates to exercise i.e. blood pressure, heart rate, stroke volume, cardiac output
- Describe the functions of the lungs and identify changes to the respiratory system as it relates to exercise i.e. Respiration, Fick's law, tidal volume

2. Identify and explain the energy systems and pathways used by the body during exercise and apply this knowledge to various activities and exercise programs

Potential Elements of the Performance:

- Define the ATP-PCr, glycolysis and oxidative energy pathways
- Differentiate between aerobic and anaerobic energy systems
- Classify activities and exercises to the appropriate energy systems and pathways
- Discuss the interaction among the three energy systems during exercise

3. Understand the difference between acute and chronic exercise and the physiological responses to both acute and chronic exercise

Potential Elements of the Performance:

- Define acute exercise
- Identify physiological responses to acute exercise
- Define chronic exercise
- Identify physiological responses to chronic exercise

4. Infer how exercise physiology concepts and theories will affect assessments of fitness and the development of an exercise program

Potential Elements of the Performance:

- Describe how the physiological and anatomical changes that occur during exercise will affect the design and implementation of exercise assessments.
- Describe how the physiological and anatomical changes that occur during exercise will affect the design and implementation of an exercise program.

5. Describe how the body expends energy during rest and exercise and how the body responds to fatigue during exercise

Potential Elements of the Performance:

- Define and differentiate between the basal metabolic rate and the resting metabolic rate
- Identify the lactate threshold and explain the relationship to exercise performance
- Describe the economy of effort and its relationship to exercise performance
- Understand the relationship between oxygen consumption and energy production

- Describe the possible causes of fatigue during exercise
- Describe the physiological basis for delayed onset of muscle soreness
- Describe the physiological basis for exercise-associated muscle cramps

III. TOPICS:

1. An Introduction to Exercise and Sport Physiology
2. Structure and Function of Exercising Muscle
3. Fuel for Exercise: Bioenergetics and Muscle Metabolism
4. Neural Control of Exercising Muscle
5. Hormonal Control During Exercise
6. Energy Expenditure and Fatigue
7. Cardiovascular System and Its Control
8. Respiratory System and Its Control
9. Cardiorespiratory Responses to Exercise
10. Adaptations to Resistance Training
11. Adaptations to Aerobic and Anaerobic Training

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Kenney, W. Larry, Jack H Wilmore, and David L Costill. Physiology Of Sport And Exercise 6th edition.

V. EVALUATION PROCESS/GRADING SYSTEM:

Test 1 – 20%
 Test 2 – 20%
 Test 3 – 30%
 Learning Activities (10) – 30%

The following semester grades will be assigned to students:

Grade	<u>Definition</u>	<i>Grade Point Equivalent</i>
A+	90 – 100%	
A	80 – 89%	4.00
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	

S	Satisfactory achievement in field /clinical placement or non-graded subject area.
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.
NR	Grade not reported to Registrar's office.
W	Student has withdrawn from the course without academic penalty.

If a faculty member determines that a student is at risk of not being successful in their academic pursuits and has exhausted all strategies available to faculty, student contact information may be confidentially provided to Student Services in an effort to offer even more assistance with options for success. Any student wishing to restrict the sharing of such information should make their wishes known to the coordinator or faculty member.

VI. SPECIAL NOTES:

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

Late Assignments:

Assignments will be accepted up to three days after the due date. Students will be deducted 1% for each day that it is late. Assignments submitted after three days of the assigned due date will not be accepted.

Missed Tests/Exams:

Students will receive a 0 for missed tests or exams. If the student cannot write the exam due to unforeseen circumstances the student must notify the instructor BEFORE the exam date. If a student missed the test/exam, did not notify the instructor prior to the exam, and still requests to write the test, the instructor *may* only accept this request if the student can provide proof of an extreme circumstance.

OFC Certification:

To obtain the Resistance Trainer, Group Fitness Trainer and Personal Trainer certifications with OFC, you must achieve a 75% overall grade in the course.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located in D2L and on the portal form part of this course outline.