



## I. COURSE DESCRIPTION:

This course is the first part of a two part series (Applied Exercise Physiology I and II). CICE students, with assistance from a learning specialist, will examine the basic 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 CICE student, with the assistance of a Learning Specialist will demonstrate a basic 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. In a basic way, 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 basic difference between acute and chronic exercise and the basic 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. Basically 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. Basically 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 (Cumulative) – 30%  
 Thought Questions – 30%

The following semester grades will be assigned to students:

#### Grade

Definition	Grade Point Equivalent
A+	90 – 100% 4.00
A	80 – 89%
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 calendar days after the due date. Students will be deducted 3% for each day that it is late. Assignments submitted after three days of the assigned due date will not be accepted and students will receive a zero grade. Exception: learning activities/thought questions are exempted from this rule, see syllabus for guidelines.

**Missed Tests/Exams:**

Students will receive a zero 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 (at least one hour for FIT155). 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.

**Addendum:**

Further modifications may be required as needed as the semester progresses based on individual student(s) abilities and agreed upon by the instructor.

**VII. COURSE OUTLINE ADDENDUM:**

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

**CICE Modifications:****Preparation and Participation**

1. A Learning Specialist will attend class with the student(s) to assist with inclusion in the class and to take notes.
2. Students will receive support in and outside of the classroom (i.e. tutoring, assistance with homework and assignments, preparation for exams, tests and quizzes.)
3. Study notes will be geared to test content and style which will match with modified learning outcomes.
4. Although the Learning Specialist may not attend all classes with the student(s), support will always be available. When the Learning Specialist does attend classes he/she will remain as inconspicuous as possible.

**A. Tests may be modified in the following ways:**

1. Tests, which require essay answers, may be modified to short answers.
2. Short answer questions may be changed to multiple choice or the question may be simplified so the answer will reflect a basic understanding.
3. Tests, which use fill in the blank format, may be modified to include a few choices for each question, or a list of choices for all questions. This will allow the student to match or use visual clues.
4. Tests in the T/F or multiple choice format may be modified by rewording or clarifying statements into layman's or simplified terms. Multiple choice questions may have a reduced number of choices.

**B. Tests will be written in CICE office with assistance from a Learning Specialist.*****The Learning Specialist may:***

1. Read the test question to the student.
2. Paraphrase the test question without revealing any key words or definitions.
3. Transcribe the student's verbal answer.
4. Test length may be reduced and time allowed to complete test may be increased.

**C. Assignments may be modified in the following ways:**

1. Assignments may be modified by reducing the amount of information required while maintaining general concepts.
2. Some assignments may be eliminated depending on the number of assignments required in the particular course.

***The Learning Specialist may:***

1. Use a question/answer format instead of essay/research format
2. Propose a reduction in the number of references required for an assignment
3. Assist with groups to ensure that student comprehends his/her role within the group
4. Require an extension on due dates due to the fact that some students may require additional time to process information
5. Formally summarize articles and assigned readings to isolate main points for the student
6. Use questioning techniques and paraphrasing to assist in student comprehension of an assignment

**D. Evaluation:**

Is reflective of modified learning outcomes.