

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



Sault College

**COURSE OUTLINE**

**COURSE TITLE:** APPLIED EXERCISE SCIENCE I  
**CODE NO. :** FIT150 **SEMESTER:** 2  
**PROGRAM:** FITNESS AND HEALTH PROMOTION  
**AUTHOR:** Allan Kary  
**DATE:** Jan. 2009 **PREVIOUS OUTLINE DATED:** N/A  
**APPROVED:** "Fran Rose"

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**CHAIR**

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**DATE**

**TOTAL CREDITS:** 6

**PREREQUISITE(S):** None

**HOURS/WEEK:** 6

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*For additional information, please contact the Chair, Health Programs*

*School of Health and Community Services*

*(705) 759-2554, Ext. 2689*

## I. COURSE DESCRIPTION:

This course is the first in a two part series (Applied Exercise Science I and Applied Exercise Science II). The course will be equally divided between theory and practical laboratory time.

**Theory:** This course examines the physiological adaptations that take place within the human body during exercise and work including the muscular system and energy usage via aerobic and anaerobic systems, the skeletal system and bone development, and the respiratory system and oxygen utilization, so that accurate assessments of fitness and well being can be performed and monitored. Assessment of physical fitness and interpretation of laboratory results will provide the basis for developing and evaluating safe and goal oriented strategies tailored to maximize the benefits of health, fitness and well being. Identification of clients who should seek medical clearance prior to performing a fitness appraisal or to becoming physically active and utilizing current theories to discuss weaknesses and strengths of performance protocols will enhance placements in a variety of worksites.

**Laboratory:** This course introduces health and fitness field and laboratory instruments, techniques and procedures for basic fitness evaluations including pulse and blood pressure readings, body mass and skin girth measurements, and several aerobic and anaerobic sub  $\text{VO}_2$  max tests. Fitness evaluations are used to establish starting points and used to evaluate a participant's competency in performing physical fitness tests and exercise.

## 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 aerobic and anaerobic energy systems, the muscular system, the skeletal and respiratory systems to physical assessments, wellness and maintaining a healthy lifestyle.
  - Energies capacity to work
  - Interconversions of energy
  - Biological work in Humans
  - Measurement of work on a treadmill, cycle, ergometer, and step bench
  - ATP
  - Phosphocreatine
  - Cellular Oxidation
  - Oxidative Phosphorylation
  - Oxygen's role in energy metabolism
  - Glycolysis
  - Lactate formation
  - Citric acid cycle
  - Energy release from fat
  - Energy release from protein
  - Interrelationships among carbohydrate, fat, and protein metabolism

- Immediate, short term, and long term energy
  - Measuring human energy expenditure during rest and exercise
  - Muscle structure and function
  - Training muscles
  - Cardiovascular system, regulation, control and integration
  - Functional capacities of the cardiovascular system
2. Assess levels of physical fitness to develop and evaluate safe and goal orientated strategies tailored to maximize the benefits of health, fitness and well being.
    - Physiques and physical activity
    - Overweight, obesity and weight control
    - Principles of weight control
    - Diet and exercise
  3. Identify clients who should seek medical clearance prior to performing a fitness appraisal or to becoming physically active.
    - Par-Q to asses readiness for physical activity
    - Patient history
    - Physical examination
    - Informed consent
  4. Utilize current theories to discuss weaknesses and strengths of performance protocols.
  5. Use heath and fitness field and laboratory instruments, techniques and procedures for basic fitness evaluations including pulse and blood pressure readings, body mass and skin girth measurements, and several aerobic and anaerobic sub  $\text{VO}_2$  max tests.
    - Components of fitness
    - Variables
    - Types of tests
    - Units of measure
    - Collection of data
    - Body mass Index
    - Girth Measurements
    - Skinfolds
    - Hydrostatic weighing
    - Resting blood pressure
    - Exercise blood pressure
    - Sprinting
    - Jumping
    - Anaerobic cycling
    - Anaerobic stepping
    - Aerobic Running, jogging, and walking
    - Aerobic stepping
    - Aerobic cycling

6. Evaluate a participant's competency in performing physical fitness tests and exercise.

### III. TOPICS:

1. Energy transfer (general, in the body, in exercise)
2. Measurements of Human energy expenditure during rest and physical activity. Swimming, walking, running, jogging.
3. Measurement of energy capacities
4. Skeletal muscle (structure, function, Training muscles to become stronger)
5. Cardiovascular system (regulation and intergration)
6. Functional capacities of the Cardiovascular system

### IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Exercise Physiology: Energy, Nutrition & Human Performance 6<sup>th</sup> ed. By McArdle, Katch and Katch.

Exercise Physiology Laboratory Manual, 5<sup>th</sup> ed. By G. M. Adams and W. C. Beam

### V. EVALUATION PROCESS/GRADING SYSTEM:

Theory will have four quizzes worth 15% each.

The lab will have a major assignment worth 30% of the course and a final exam worth 10%.

The following semester grades will be assigned to students in post-secondary courses:

| <u>Grade</u> | <u>Definition</u>  | <u>Grade Point Equivalent</u> |
|--------------|--|-------------------------------|
| A+           | 90 – 100%  | 4.00                          |
| A            | 80 – 89%   | 3.00                          |
| B            | 70 - 79%   | 2.00                          |
| C            | 60 - 69%   | 1.00                          |
| D            | 50 – 59%   | 0.00                          |
| F (Fail)     | 49% and below  |                               |
| 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. |

**Note:** For such reasons as program certification or program articulation, certain courses require minimums of greater than 50% and/or have mandatory components to achieve a passing grade.

It is also important to note, that the minimum overall GPA required in order to graduate from a Sault College program remains 2.0.

## VI. SPECIAL NOTES:

### Disability Services:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Disability Services office. Visit Room E1101 or call Extension 2703 so that support services can be arranged for you.

### Retention of Course Outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other post-secondary institutions.

### Communication:

The College considers **WebCT/LMS** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the **Learning Management System** communication tool.

### Plagiarism:

Students should refer to the definition of "academic dishonesty" in *Student Code of Conduct*. Students who engage in "academic dishonesty" will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

### Course Outline Amendments:

The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

**VII. PRIOR LEARNING ASSESSMENT:**

Students who wish to apply for advance credit transfer (advanced standing) should obtain an Application for Advance Credit from the program coordinator (or the course coordinator regarding a general education transfer request) or academic assistant. Students will be required to provide an unofficial transcript and course outline related to the course in question.

Credit for prior learning will also be given upon successful completion of a challenge exam or portfolio.