

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



Sault College

**COURSE OUTLINE**

**COURSE TITLE:** Introduction to Life Sciences II  
**CODE NO. :** PSW132 **SEMESTER:** 2  
**PROGRAM:** Personal Support Worker  
**AUTHOR:** Donna Alexander  
**DATE:** Sept. 2006 **PREVIOUS OUTLINE DATED:** Mar. 2006  
**APPROVED:**

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**ASSOCIATE DEAN**

\_\_\_\_\_  
**DATE**

**TOTAL CREDITS:** 3  
**PREREQUISITE(S):** PSW122  
**HOURS/WEEK:** 3

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*For additional information, please contact the Associate Dean,*  
*School of Health and Human Services*  
*(705) 759-2554, Ext. 2689*

**I. COURSE DESCRIPTION:**

This course will provide the learner with skills required to perform basic measurements, calculations, and conversions that apply to the health field. The course is designed to assist the learner to acquire the knowledge and master mathematic skills required in providing client care. The Imperial System of measurements and the International System of Units and Measurements will be examined. This course will also examine the basic concepts of inorganic chemistry, organic chemistry and biochemistry. The emphasis will be on the relationship of chemistry principles to the human body.

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

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

1. Act within the personal support role, under supervision and by following care/service plans and established policies and procedures.

Potential Elements of the Performance:

- Explain how knowledge of chemistry relates to the role of the personal support worker in providing client-centered and client-directed care.
- Explain the importance of performing accurate mathematical calculations within the role of the personal support worker in providing client care.

2. Use, under supervision, basic knowledge, care/service plans, and established policies and procedures.

Potential Elements of the Performance:

- Define basic terms that relate to inorganic chemistry, organic chemistry, and biochemistry.
- Describe the relationship between chemistry and homeostasis.
- Identify the three components of an atom.
- Explain the role of electrons in the formation of chemical bonds.
- Differentiate between ionic, covalent, and hydrogen bonds.
- Explain the difference between a molecule and a compound.
- Identify the elements present in various compounds.
- Describe chemical reactions and the role of catalysts and enzymes.
- Describe pH in terms of hydrogen ion concentration and the three mechanisms that regulate pH in the body.
- Differentiate between an acid, a base and a salt.
- Explain the acid-base imbalances of acidosis and alkalosis and the associated responses within the human body.
- Describe osmosis, diffusion, passive transport, and active transport and identify where these processes occur within the human body.
- Differentiate between mixtures, solutions, suspensions, and colloidal suspensions.
- Identify functional groups in organic compounds and their relationship to body processes.
- Define metabolism, anabolism, and catabolism.
- Explain the use of carbohydrates, lipids, and proteins in the body.
- Identify reasons why water is essential to life.

- Describe intracellular and extracellular fluid compartments and the common ions found in each compartment.
  - Explain the concept of intake and output.
  - Identify factors that affect electrolyte imbalances.
3. Make, collect, and report to the supervisor relevant observations in an ongoing and timely manner and record this information promptly.

Potential Elements of the Performance:

- Identify typical physiological responses that clients may manifest when experiencing chemistry related changes in cell functioning, alterations in cell metabolism, and imbalances in fluid and electrolytes.
4. Communicate effectively and appropriately using oral, written, and non-verbal methods.

Potential Elements of the Performance:

- Use basic terms that relate to inorganic chemistry, organic chemistry, and biochemistry appropriately.
  - Write and speak clearly using the correct terms and abbreviations.
5. Execute mathematical operations with the accuracy required to solve routine problems.

Potential Elements of the Performance:

- Identify situations that require the use of mathematics.
- Apply mathematical principles and perform accurate routine mathematical operations.
- Estimate probable answers and identify errors in numerical answers.
- Determine the appropriate fit between problems and answers.
- Use and convert measurements in the International System of Units (SI) in applied situations.
- Convert quantities from a metric unit to an Imperial unit or vice versa.
- Calculate units of measure in applied situations with regard to height, weight, temperature, intake and output, and medication quantities.

### III. TOPICS:

1. Whole numbers, fractions, and decimals
2. Imperial units and measurements
3. International System of Units and measurements
4. Mathematical operations and metric conversion
5. Inorganic chemistry
6. Organic chemistry
7. Biochemistry
8. Cell metabolism
9. Water, electrolytes, and acid-base balance

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

Herlihy, B. & Maebius, N. K. (2003). *The human body in health and illness* (2<sup>nd</sup> ed.). Elsevier W. B. Saunders.

Chapter 2	Basic Chemistry
Chapter 4	Cell Metabolism
Chapter 22	Water, Electrolyte, and Acid-Base Balance

Herlihy, B. (2003). *Study guide for the human body in health and illness* (2<sup>nd</sup> ed.) Elsevier W.B. Saunders.

Sackheim, G. (2005). *An introduction to chemistry for biology students* (8<sup>th</sup> ed.) Pearson

Chapter 1	Atomic Structure
Chapter 2	Chemical Symbols
Chapter 3	Atoms and Molecules
Chapter 4	Ionization
Chapter 5	Liquid Mixtures
Chapter 6	Diffusion and Osmosis
Chapter 8	The Covalent Bond
Chapter 9	Polar and Nonpolar Covalent Bonds
Chapter 10	Functional Groups
Chapter 11	Hydrogen Bonds
Chapter 13	Carbohydrates
Chapter 14	Lipids
Chapter 15	Proteins

Math Manual – to be provided

**V. EVALUATION PROCESS/GRADING SYSTEM:**

- 4 Tests (20% each) 80%
- 2 Assignments (10% each) 20%

**A minimum of a “C” grade is required to be successful in all PSW coded courses.**

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:

### Special Needs:

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 Special Needs 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.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in the *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 advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

**VIII. DIRECT CREDIT TRANSFERS:**

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.