



COURSE OUTLINE

NRT141

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Prepared: Lynn Goulding Approved: Sherri Smith

Course Code: Title	NRT141: SCIENCE AND NATURE
Program Number: Name	5214: FISH/WILD CONSERVATN
Department:	NATURAL RESOURCES PRG
Semester/Term:	17F
Course Description:	This course examines six topics of science that provide a fundamental understanding of the relationship of scientific research, biology and chemistry to natural resource management. Topics include Science and the Scientific Method, The Hierarchy of Matter, The Species in an Evolutionary Context, Use of the Periodic Table, The Cell as the Fundamental Unit of Life and Chemical Interactions in the Environment.
Total Credits:	3
Hours/Week:	3
Total Hours:	45
Vocational Learning Outcomes (VLO's): Please refer to program web page for a complete listing of program outcomes where applicable.	#1. Demonstrate clear, concise and industry appropriate written, spoken and visual communication skills #4. Demonstrate the correct use of standard laboratory equipment and skills required to carry out experiments and study various organisms. #7. Recognize the contributions and applications of various science disciplines in the understanding of natural environments. #8. Demonstrate an understanding of sustainable development and apply these principles to the natural environment. #10. Evaluate and apply current technologies and mathematical concepts used to collect, manage and analyze data. #11. Analyze, evaluate and apply subjective and objective safety considerations.
Essential Employability Skills (EES):	#1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience. #2. Respond to written, spoken, or visual messages in a manner that ensures effective communication. #3. Execute mathematical operations accurately. #4. Apply a systematic approach to solve problems. #6. Locate, select, organize, and document information using appropriate technology and information systems. #7. Analyze, evaluate, and apply relevant information from a variety of sources.



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- #8. Show respect for the diverse opinions, values, belief systems, and contributions of others.
- #9. Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.
- #10. Manage the use of time and other resources to complete projects.
- #11. Take responsibility for ones own actions, decisions, and consequences.

General Education Themes: Science and Technology

Course Evaluation: Passing Grade: 50%, D

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Labs (6)	40%
Test and Quizzes	60%

Course Outcomes and Learning Objectives:

Course Outcome 1.

Explain and apply the scientific method to natural resource problem solving.

Learning Objectives 1.

- Distinguish between science and technology.
- Describe the steps in the scientific method.
- Using the scientific method demonstrate how you would solve a given natural resource problem.
- Prepare a technical report to describe the results of a lab analysis of waste recycling at Sault College.
- Describe the organization and purpose of each section of a technical report.

Course Outcome 2.

Explain the Hierarchy of Matter.

Learning Objectives 2.

- Show the connectivity and increasing complexity of nature from atomic particles to the total ecosphere.



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Demonstrate the dependence of all levels of nature on chemical interaction.
Show how chemistry, biology and ecology are inter-related through the hierarchy of matter.

Course Outcome 3.

Explain the relationship of species to evolutionary process.

Learning Objectives 3.

Describe the various criteria used to determine species status.
Explain the basis for classifying living organisms.
Categorize select examples of specimens from the field into their respective taxonomic groups.
Correctly use the binomial system of classification.
Give examples of morphological, anatomical, physiological, behavioural and ecological characteristics used to distinguish species.

Course Outcome 4.

Explain cellular functions.

Learning Objectives 4.

Identify the fundamental components of a living cell and explain their functions.
Characterize and provide examples of the 4 basic life molecules: sugars, proteins, lipids and nucleic acids.
Explain how cells obtain nutrients.
Summarize the processes of photosynthesis, respiration, diffusion, protein synthesis and exchange of genetic information.
Demonstrate division of function in multi-cellular organisms.

Course Outcome 5.

Explain various characteristics of water as they relate to life systems.

Learning Objectives 5.



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Describe various chemical and physical properties of water including: density, viscosity, polarity, surface tension, specific heat, solubility and pH.
Determine the dissolved oxygen concentration of water using a titration method.
Calculate acid/base neutralizations.
Determine the pH of water using a titration method and a pH meter.
Explain thermal stratification of lakes and lake turnover.

Course Outcome 6.

Demonstrate the relationships of chemical interactions to important global environmental issues.

Learning Objectives 6.

Explain bio-magnification
Describe the causes for and impacts of the following global environmental problems:
i) acid deposition
ii) ozone depletion
iii) global warming
iv) eutrophication

Course Outcome 7.

Develop proficiency in the use of the compound microscope.

Learning Objectives 7.

Use a compound microscope to observe and draw cellular material.
Measure size of microscopic materials.
Calculate the scale of drawings.
Demonstrate proper care and handling of the microscope.

Course Outcome 8.

Develop safe and correct lab technique with respect to chemical handling and instrument use.



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Learning Objectives 8.

Discuss and apply safe lab procedures including handling of dangerous chemicals.
Demonstrate knowledge of the Workplace Hazardous Materials Information System.
Demonstrate use of balances, pH metre, glassware including pipettes and burettes, hot plates, fume hoods.
Prepare solutions.
Conduct titration procedures.

Course Outcome 9.

Develop a working knowledge of the periodic table.

Learning Objectives 9.

Distinguish between metals, non-metals and noble gases.
Demonstrate relationships between protons, electrons and neutrons in identifying chemical elements
Determine electron configurations of atoms.
Identify valence shells and valence electrons.
Determine potential atomic arrangements of ions and covalent compounds.
Calculate gram molecular weights of compounds.
Demonstrate use of Lewis dot diagrams.
Use tables to determine energy changes in combustion reactions.

Date:

Thursday, August 31, 2017

Please refer to the course outline addendum on the Learning Management System for further information.