

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



COURSE OUTLINE

COURSE TITLE: Ecology

CODE NO. : NRT109 **SEMESTER:** 15W

PROGRAM: Fish & Wildlife Conservation, Adventure Recreation and Parks, Forest Conservation Technician, Natural Environment Technician, Natural Environment Technologist and Field Naturalist and Introduction to Natural Resources Certificates

AUTHOR: Jerry A. Zuchlinski, M.Sc.

DATE: May 2014 **PREVIOUS OUTLINE DATED:** May 2013

APPROVED:

	_____	_____
	CHAIR	DATE
TOTAL CREDITS:	3	

PREREQUISITE(S): None

HOURS/WEEK:

Copyright ©2009 The Sault College of Applied Arts & Technology
Reproduction of this document by any means, in whole or in part, without prior written permission of Sault College of Applied Arts & Technology is prohibited.
For additional information, please contact <name>, Chair
School of <name>
(705) 759-2554, Ext. <number>

I. COURSE DESCRIPTION:

This is an introductory course to provide students with an understanding of ecology as it relates to natural environments. The course covers a wide range of topics that examine the interactions between organisms and their physical environment. A combination of lectures, labs and field surveys provide insight into the structure and function of ecosystems in general; but emphasize forest and freshwater ecosystems in Canada

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Identify the 6 attributes of an ecosystem and describe their implications
Potential Elements of the Performance:
 - Distinguish between biotic and abiotic components of an ecosystem
 - Describe trophic relationships between autotrophs, heterotrophs, and decomposers in energy transfer and material movement
 - Distinguish between microconsumers and macroconsumers
 - Identify the 3 major abiotic components of ecosystems and their contribution to ecosystem function; including inorganic material, organic material and climatic factors
 - Demonstrate an understanding of complexity, interaction and interdependence, lack of spatial dimension and ecosystem dynamics as they relate to ecosystem structure and function

2. Describe the role of bacteria as they relate to the structure and function of ecosystems
Potential Elements of the Performance:
 - Describe key characteristics of bacteria
 - Demonstrate techniques for the identification of bacteria including gram staining, culture of agar plates and microscopic examination of colony characteristics
 - Discuss the importance of various groups of bacteria in relation to decomposition, nutrient cycling, as pathogens and as chemo and photoautotrophs

3. Demonstrate the significance of ecological energetics
Potential Elements of the Performance:
 - Describe biotic and abiotic sources of energy
 - Distinguish between and provide examples of food webs, food chains, and ecological pyramids
 - Describe the ecological relationship between photosynthesis and respiration
 - Classify organisms by trophic function
 - Distinguish between gross, primary, net and secondary productivity

4. Discuss the role of major abiotic factors in natural ecosystems
Potential Elements of the Performance:
 - Describe characteristics of light and their relationship to organisms
 - Provide examples of positive and negative influences of: temperature, photoperiod, solar radiation, humidity, precipitation, wind, soils, fire and topography
 - Demonstrate how insects use heat accumulation information to break diapause
 - Be able to calculate degree day values
 - Distinguish between and provide examples of geochemical and biogeochemical cycling
 - Briefly describe the major steps in the following nutrient cycles: nitrogen, carbon and hydrological
 - Identify symptoms of deficiency and /or excess of each macronutrient

5. Apply the concepts of ecological tolerance, niche and habitat
Potential Elements of the Performance:
 - Define niche and habitat
 - Demonstrate the effect of ecological tolerance limits in relation to range and distribution
 - Provide examples of terrestrial and aquatic habitat variation and how organisms adapt to occupy specific niches
 - Describe adaptive strategies to avoid niche overlap
 - Describe the niche, habitat, range and distribution of select species

6. Discuss various general characteristics of populations
Potential Elements of the Performance:
Potential Elements of the Performance:
 - Differentiate between the following symbiotic relationships: parasitism, mutualism, commensalism and disease and

examples

- Differentiate between interspecific and intraspecific competition and provide example
- Explain the carrying capacity concept

7. Discuss characteristics of community structure and species interaction

Potential Elements of the Performance:

- Provide examples of community stratification in terrestrial and aquatic ecosystems
- Distinguish between vertical and horizontal stratification and discuss their significance in biodiversification
- Explain the evaluation of biodiversity at the species, community and landscape level
- Describe ecological characteristics of ecotones
- Describe the ecological relationships between terrestrial and aquatic interfaces
- Describe the stages of ecological succession using various examples
- Distinguish between primary and secondary succession
- Describe how communities respond to disturbance such as wind, fire, timber harvesting, flooding, disease and erosion
- Conduct an ecological survey of a forest community to determine vertical stratification and community composition

III. TOPICS:

1. The scope of ecology
2. Ecosystem characteristics
3. Trophic relationships and ecological energetics
4. Abiotic influences in ecosystems
5. Ecological characteristics of species
6. Characteristics Ecological of populations
7. Community structure
8. Community succession
9. Biodiversity

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Zuchlinski, J.A. 2014. Ecology Study Guide and Lab Manual

V. EVALUATION PROCESS/GRADING SYSTEM:

Mid-term Test	20%
Final Test	20%
Labs	50%
Assignments	<u>10%</u>
TOTAL	100%

NOTE: Labs are an essential component of this course. As such, failure to attend any lab without suitable reason and without reasonable notification will result in a 5% deduction from your final mark for each lab missed. As an example, if you have a final mark of 75% and you missed 2 labs the final mark will be downgraded to 65%,

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.	



COURSE OUTLINE ADDENDUM

1. 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.
2. 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 postsecondary institutions.
3. 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. Please refer to the Student Academic Calendar of Events for the deadline date by which application must be made for advance standing.

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

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

4. Accessibility Services:
If you are a student with a disability (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Accessibility Services office. Visit Room E1101 or call Extension 2703 so that support services can be arranged for you.
5. Communication:
The College considers ***Desire2Learn (D2L)*** 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 this Learning Management System (LMS) communication tool.

6. Academic Dishonesty:

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.

7. Tuition Default:

Students who have defaulted on the payment of tuition (tuition has not been paid in full, payments were not deferred or payment plan not honoured) as of the first week of November (fall semester courses), first week of March (winter semester courses) or first week of June (summer semester courses) will be removed from placement and clinical activities due to liability issues. This may result in loss of mandatory hours or incomplete course work. Sault College will not be responsible for incomplete hours or outcomes that are not achieved or any other academic requirement not met as of the result of tuition default. Students are encouraged to communicate with Financial Services with regard to the status of their tuition prior to this deadline to ensure that their financial status does not interfere with academic progress.

8. Student Portal:

The Sault College portal allows you to view all your student information in one place. **mysaultcollege** gives you personalized access to online resources seven days a week from your home or school computer. Single log-in access allows you to see your personal and financial information, timetable, grades, records of achievement, unofficial transcript, and outstanding obligations, in addition to announcements, news, academic calendar of events, class cancellations, your learning management system (LMS), and much more. Go to <https://my.saultcollege.ca>.

9. Recording Devices in the Classroom:

Students who wish to use electronic devices in the classroom will seek permission of the faculty member before proceeding to record instruction. With the exception of issues related to accommodations of disability, the decision to approve or refuse the request is the responsibility of the faculty member. Recorded classroom instruction will be used only for personal use and will not be used for any other purpose. Recorded classroom instruction will be destroyed at the end of the course. To ensure this, the student is required to return all copies of recorded material to the faculty member by the last day of class in the semester. Where the use of an electronic device has been approved, the student agrees that materials recorded are for his/her use only, are not for distribution, and are the sole property of the College.

