

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



Sault College

**COURSE OUTLINE**

**COURSE TITLE:** ICHTHYOLOGY  
**CODE NO. :** NRT 228 **SEMESTER:** III  
**PROGRAM:** Fish & Wildlife Technician  
**AUTHOR:** H. Robbins  
**DATE:** June 2005 **PREVIOUS OUTLINE DATED:** Aug. 2004  
**APPROVED:**

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		<b>DEAN</b>	<b>DATE</b>
<b>TOTAL CREDITS:</b>	3		
<b>PREREQUISITE(S):</b>	NONE		
<b>HOURS/WEEK:</b>	3		

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*For additional information, please contact Colin Kirkwood, Dean*  
*School of Technology, Skilled Trades & Natural Resources*  
*(705) 759-2554, Ext.688*

**I. COURSE DESCRIPTION:**

This course concentrates on fundamental aspects of anatomy, physiology, ecology and natural history of fishes of the Great Lakes Region. Lab sessions will develop skills in the identification and classification of freshwater fishes as well as in the identification of their common parasites. A freshwater small fish collection is required for submission.

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

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

1. **Identify freshwater fishes from the Great Lakes basin to the family, genus and species level based on taxonomic characteristics.  
Use important body parts to determine the age of fish.**

Potential Elements of the Performance:

**1<sup>st</sup> Lab Test**

- correctly identify both external and internal anatomical structures of a fish
- correctly demonstrate the use of meristics and morphometrics in fish classification
- recognize common fish families given key characteristics
- list the major fish orders and their associated families with species representatives for each family
- demonstrate effective use of a bifurcated (dichotomous) fish key

**2<sup>nd</sup> Lab test**

- identify to species Ontario's important sports and commercial fishes
- correctly identify to species juvenile salmonids and larval lamprey found in Ontario
- document the important anatomical features of the three major stages of aquatic insects used in their identification
- Using scales, otoliths, and fin ray sections document the aging technique and age fish

*This learning outcome will constitute approximately 40% of the course.*

2. **Demonstrate an understanding of the morphological and physiological adaptations of freshwater fishes to the aquatic environment.**

Potential Elements of the Performance:

**1<sup>st</sup> Theory Test**

- discuss the relative proportions of marine versus freshwater species as well as the significance of fish relative to other vertebrates.
- explain the characteristics of water and its influence on fish design
- list the six (6) basic fish body shapes and key features for each
- discuss the function of external/internal structures and basic physiology of a generalized fish including respiration, circulation, buoyancy and thermal regulation, osmoregulation, growth, nervous and endocrine systems and reproduction
- differentiate between anadromous and catadromous fishes, giving examples of each
- discuss the various reproductive strategies of fish and their relative success

*This learning outcome will constitute approximately 25% of the course.*

3. **Outline the biology and ecology of selected freshwater fishes of Ontario.**

Potential Elements of the Performance:

**2<sup>nd</sup> Theory Test**

- discuss the stages of fish development from egg to adult
- demonstrate an understanding of terminology specific to the salmon family and to the lamprey family
- summarize the biology of significant Ontario fish species based on classification, range, description, habitat, food habits, reproduction and importance.
- outline the life cycle and discuss the importance of common parasites in Ontario
- list the various fish aging structures and discuss the distinguishing features and advantages for each

*This learning outcome will constitute approximately 35% of the course.*

**III. TOPICS:**

1. Fish classification and identification.
2. Aquatic Invertebrate Anatomy
3. Fish Ecology/Physiology
4. Fish Biology
5. Fish aging

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

Ichthyology (NRT 228) Study Guide, 2005  
Sault Ste.Marie, Sault College of Applied Arts & Technology.

Ichthyology (NRT 228) Lab Manual, 2005  
Sault Ste.Marie, Sault College of Applied Arts & Technology.

Scott, W.B. and E.J. Crossman.1998. Freshwater Fishes of Canada. Oakville, Gate House Publications Ltd.966 pp.

Set of 12 vials/ small bottles for fish collection –preservative will be provided.

Lab coat

Dissecting Kit

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

<b>Unit Tests</b>	<b>25%</b>
<b>Lab tests/Assignments</b>	<b>40%</b>
<b>Physiology Summary</b>	<b>10%</b>
<b>Small Fish Collection</b>	<b>15%</b>
<b>Fish Biology Presentation</b>	<b><u>10%</u></b>
	<b>100%</b>

Lab assignments and report values will be reduced at a rate of 10% per day for late submissions for a period of 5 days after the due date. After 5 days lab assignment/report value will be zero.

All labs and assignments must be submitted regardless of lateness to pass the course. Labs and/or tests missed without documented health or personal reasons will be valued at zero.

The following semester grades will be assigned to students in postsecondary courses:

<b>Grade</b>	<b><u>Definition</u></b>	<i>Grade Point Equivalent</i>
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.	

## 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 instructor and/or the Special Needs office. Visit Room E1204 or call Extension 493 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 postsecondary institutions.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. 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.