

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: FISHERIES BIOLOGY

Code No.: FOR 327 - 3


Program: FISH AND WILDLIFE TECHNOLOGY

Semester: V

Date: AUGUST, 1984

Author: V. WALKER & A. DUPONT

New: _____ Revision: X

APPROVED:  _____
Chairperson Date

CALENDAR DESCRIPTION

FISHERIES BIOLOGY

FOR 327

COURSE NAME

COURSE NUMBER

PHILOSOPHY/GOALS:

A course designed to provide the student with the necessary background for management. The principles of aquatic ecology, the life history and classification of important Ontario fishes and the mechanics of describing fish population are discussed. In addition, the principles which apply to the management of fisheries will be addressed.

METHOD OF ASSESSMENT (GRADING METHOD):

	MARKS
Unit Tests (3)	45
Laboratory Tests (5)	45
Oral Presentation (1)	10

TOTAL	100

TEXTBOOK(S):

No textbook needed to be purchased.

FISHERIES BIOLOGY

LECTURE FORMAT

UNIT I - Structure and Form

- introduction to fishes
- form and movement
- respiration, circulation, reproduction
- sensory perception

UNIT II - Systematics and Nomenclature

- fish classification
- biology of sports fish (oral presentations)

UNIT III - Ecology and Population Dynamics

- temperate streams
- temperate lakes
- age and growth, mortality
- acid rain, effects on fish productivity
- dynamics of exploited populations
- disease and parasites

UNIT IV - Principles in Fisheries Management

- objectives of management
- introduction to SPOF, STOCKS, SLIS, SCOL, and PERCID (symposiums and working groups)
- role of hatchery-reared fish (Video)
- control of undesirable species

LAB FORMAT

Lab Number	Date	Work Description
Lab #1	Aug. 29/84	Introduction to course and lab procedures
Lab #2	Sept. 5/84	- use keys found in Scott & Crossman to classify fish from the following families: -Lamprey -Whitefish -Sturgeon -Grayling -Carp -Smelt -Bowfin -Pike -Herring -Mudminnow -Salmon & Trout - Key Quiz - use of key.
Lab #3	Sept. 12/84	- Lab Test (Fish Quiz) - on selected samples from families found in Lab #2 - remaining lab time - again using keys work through samples from the following fish families: -Sucker -Minnow
Lab #4	Sept. 19/84	- Lab Test (Fish Quiz) - on selected samples from families found in Lab #3. - again using keys, work through samples from the following fish families: -Catfish -Temperate Bass -Freshwater Eel -Sunfish -Killifish -Perch -Cod -Drum -Stickleback -Sculpin
Lab #5	Sept. 26/84	- Lab Test (Fish Quiz) -on selected samples from families found in lab #4 - remainder of lab, review of all families displayed in labs 2, 3 and 4.

LAB FORMAT (Cont'd)

Lab Number	Date	Work Description
Lab #6	Oct. 3/84	- Final Lab Test (Fish Quiz) - responsible for any previously displayed sample from labs 2, 3 and 4.
<p>*NOTE: - A Grade of <u>85%</u> is mandatory for each lab test. - in addition students must be 100% accurate when identification deals with the 20 major game species of Ontario. - scientific names <u>must</u> accompany common names <u>only</u> for these 20 major species</p>		
Lab #7	Oct. 10/84	- The remainder of lab times will vary in content between lecture material, student oral presentations and video displays all of which are subject to scheduling limitations and availability.
Lab #8	Oct. 17/84	
Lab #9	Oct. 24/84	- Term Tests will also be administered during lab hours
Lab #10	Oct. 31/84	
Lab #11	Nov. 7/84	
Lab #12	Nov. 14/84	
Lab #13	Nov. 21/84	
Lab #14	Nov. 28/84	
Lab #15	Dec. 5/84	
Lab #16	Dec. 12/84	
Lab #17	Dec. 19/84	

Schedule subject to change.

FISHERIES BIOLOGY

References

As there is no main textbook required for this course it is strongly recommended that any reference material cited during both lectures and laboratories be recorded in your notes for future use. Material in short supply will be available in the library on reserve.

Bennett, G.W. 1971. Management of Lakes and Ponds. 2nd edition. Van Nostrand Reinhold, Toronto.

Davis, H.S. 1973. Culture and Diseases of Game Fishes. University of California Press, Berkeley.

Everhart, W.H., A.W. Eipper and W.D. Youngs. 1975. Principles of Fisheries Science. Cornell University Press, Ithaca, London.

Fisheries Management, 1980 edited by Robert T. Lackey and Larry A. Nielson. John Wiley and Sons, Toronto.

Lagler, K.F., J.E. Bardach and R.R. Miller, 1962. Ichthyology. John Wiley and Sons, Inc., New York.

Moyle, P.B. and J.J. Cech, Jr. 1982. Fishes: An Introduction to Ichthyology. Prentice-Hall Inc., New Jersey.

Scott, W.B. and E.J. Crossman, 1973. Freshwater Fishes of Canada. Bulletin 184. Fish Res. Board of Can., Ottawa.

FISH DISEASE REFERENCES

GENERAL

- MAWDESLEY THOMAS, L.E., ed. 1972. Diseases of Fish.
No. 30. Symposia of the Zoological Society of
London, Academic Press, London and New York.
- RIBELIN, W.E., and G. MIGAKI, eds. 1975. Pathology of
Fishes. University of Wisconsin Press, Madison,
WI. pp. 1004.
- ROBERTS, R.J., ed., 1978. Fish Pathology. Bailliere
Tindall, London. pp. 1978.
- ROBERTS, R.J. and C.J. SHEPHERD, 1974. Handbook of Trout
and Salmon Diseases. Fishing News (Books) Ltd.,
Surrey, England. pp. 168
- WARREN, J.C. 1978. Diseases of hatchery fish. United
States Fish and Wildlife Service. Twin Cities,
Minnesota. pp. 94
- WOOD, J.W. 1968. Diseases of Pacific Salmon, their
Prevention and Treatment. Hatchery Division,
Department of Fisheries, State of Washington,
Olympia, WA. pp. 82.

BACTERIAL AND FUNGAL (see also GENERAL references above)

- BULLOCK, G.L., D.A. CONROY, S.F. SNIEZSKO 1971.
Bacterial diseases of fishes. In Snieszko S.K.
and H.R. Axelrod, eds. BOOK 2A of Diseases of
Fishes. T.F.H. Publications, Inc., Neptune City,
N.J. pp. 151.

VIRAL (see also GENERAL references above).

- SNIESZKO, S.F., R.F. NIGRELLI, K. WOLF. 1965.
Viral disease of Poikilothermic Vertebrates.
New York Academy of Sciences. Annals of the
New York Academy of Sciences, New York, N.J.
pp. 680.
- WOLF, K. 1966. The Fish Viruses. Advances in Virus
Research. Vol. 12, Academic Press. New York,
N.J. pp. 36-101.

FISH DISEASE REFERENCES (cont'd)

PARASITIC (see also GENERAL references above).

HOFFMAN, G.L., 1967. Parasites of North American Freshwater Fishes, Universit of California Press, Berkeley, CA pp. 486.

HOFFMAN, G.L. AND F.P. MEYER. 1974. Parasites of Freshwater Fishes. T.F.H. Publications, Inc., Neptune City, N.J. pp. 224.

KABATA, Z. 1970. Crustacea As Enemies of Fishes. In S.F. Snieszko and H.R. Axelrod, eds. Book 1 of Diseases of Fishes. T.F.H. Publications, Inc., Neptune City, N.J. pp. 171.

NUTRITIONAL

ASHLEY, L.M. 1972. Nutritional Pathology. In Halver, J.W., ed. fish Nutrition. Academic Press, New York N.Y. pp. 439-537.

HALVER, J.E. 1976. Nutritional Deficiency Diseases In Salmonids. Fish Pathology 10: 165-180.

ENVIRONMENTAL AND EFFECTS OF ENVIRONMENT OF INFECTIOUS DISEASES
(see also GENERAL references above).

FRYER, J.L. AND K.S. PILCHER. 1974 Effects of Temperature of Diseases of Salmonid Fishes. U.S. Environmental Protection Agency. Washington, D.C. pp. 115.

WEDEMEYER, G.A., F.P. MEYER, L. SMITH. 1976. Environmental Stress and Fish Diseases. In S.F. Snieszko and H.R. Axelrod, eds. Book 5 of Diseases of Fishes. T.F.H. Publications, Inc., Neptune City, N.J. pp. 192

FISHERIES BIOLOGY

STUDENT EVALUATION

A. Term Test

There will be three term tests based on lecture material following Units I, III, & IV. Each term test will be valued at 15 marks each, comprising 45% of the course grade.

B. Laboratory Test

Several practical lab tests based on the identification of Ontario's freshwater fish will comprise 40% of the course grade.

Students will also be tested on the use of identification keys.

C. Presentation

Students will give a 20 minute (min - max) oral presentation (complete with visual aids, overheads etc.) for a total value of 10% of the course grade.

Each student will draw at random a fish species from the major Ontario fishes. A list of species will be provided. It is expected that each species will be thoroughly researched as far as life history and biology. Term tests will include that information presented by each student.

Presentation dates will also be randomly drawn by the students and will commence during Lab #8.

ONTARIO FISH SPECIES FOR ORAL PRESENTATIONS

<u>Common Name(s)</u>	<u>Scientific Name</u>
1. Lake trout	<u>Salvelinus namaycush</u>
2. Brook trout	<u>Salvelinus fontinalis</u>
3. Rainbow trout	<u>Salmo gairdneri</u>
4. Brown trout	<u>Salmo trutta</u>
5. Lake whitefish	<u>Coregonus clupeaformis</u>
6. Crisco	<u>Coregonus artedii</u>
7. Smallmouth bass	<u>Micropterus dolomieu</u>
8. Largemouth bass	<u>Micropterus salmoides</u>
9. Rock bass	<u>Ambloplites rupestris</u>
10. Pumpkinseed	<u>Lepomis gibbosus</u>
11. White bass	<u>Morone chrysops</u>
12. Brown bullhead	<u>Ictalurus nebulosus</u>
13. Channel catfish	<u>Ictalurus punctatus</u>
14. Northern Pike	<u>Esox lucius</u>
15. Muskellunge	<u>Esox masquinongy</u>
16. Carp	<u>Cyprinus carpio</u>
17. White sucker	<u>Catostomus commersonii</u>
18. Yellow pickerel (Wallege)	<u>Stizostedion vitreum</u>
19. Yellow perch	<u>Perca flavescens</u>
20. Rainbow smelt	<u>Osmerus mordax</u>

- Depending on class size:
- A) if larger than 20 - more species will be added or alternate topics will be added to this list.
 - B) if smaller than 20 - remaining species will be covered in lectures.

PRESENTATION TOPICS

1. Invasion of the Sea Lamprey in the Great Lakes.
2. Introduction of the Pink Salmon to the Great Lakes.
3. The Morphoedaphic Index.
4. The SCOL Symposium.
5. The PERCID Symposium.
6. SPOF.
7. Acid Rain and its effect of Fish Production.
8. Common Ontario Fish Parasites - cause and diagnosis.
9. Fish Development - F: Salmonidae.