

FOR 301-4

BIOMETRICS

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

BIOMETRICS

Course Title: _____

Code No.: FOR 301-4 _____

Program: FISH & WILDLIFE TECHNOLOGY _____

Semester: FIVE _____

Date: MAY, 1985 _____

Author: VALERIE WALKER _____

New: _____ Revision: X _____

APPROVED:  _____
Chairperson

_____ Date

BIOMETRICS

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Course Name

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PHILOSOPHY/GOALS:

The course will review basic descriptive statistics, their uses and limitations followed by problem solving using the binomial, Poisson, normal and t-distributions. The use of confidence limits in hypothesis testing is considered, followed by an introduction to analysis of variance. Emphasis is placed on solving typical problems in the specialized area using statistical package and library programs. An effort is made to consider practical fish and wildlife problems encountered by resource managers.

METHOD OF ASSESSMENT (GRADING METHOD):

	MARKS
MIDTERM TESTS (2)	40
FINAL TEST	40
ASSIGNMENTS	20
TOTAL	100

TEXTBOOK(S):

Scheffler, William C., 1980. Statistics for the Biological Sciences, Addison-Wesley Publishing Co., Don Mills, Ontario.

STUDENT EVALUATION:

A total of three (3) term tests will be written after units 2, 4, and 7.

A series of homework questions will be assigned for a total value of 20%.
A pass mark for the course is 60%.

The final mark will be awarded which is higher of either:

- a) the final examination
- b) weighted mark calculated on the basis of all the term tests and assignments.

EQUIPMENT:

An electronic calculator is mandatory for classroom and test purposes.

REFERENCE TEXTS:

Alder, H.L. and E.B. Roessler, 1972. Introduction to Probability and Statistics, Freeman, San Francisco, 373 p.

Finney, D.J., 1966. Experimental Design and Its Statistical Basis, Univ. Chicago Press, Chicago, 169 p.

Giles, R.H. (Editor), 1971. Wildlife Management Techniques, The Wildlife Society, Washington, 633 p.

Levin, R.I. and D.S. Rubin, 1980. Applied Elementary Statistics, Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

Ricker, W.E., 1968. Methods for Assessment of Fish Production in Fresh Water, IBP Handbook No. 3, Blackwell, Oxford 313 p.

Sanders, D.H., A.F. Murph and R.J. Eng, 1980. Statistics: A Fresh Approach, McGraw-Hill Book Company, Toronto.

Snedecor, G.W. and W.G. Cochran, 1967. Statistical Methods, 6th Edition, Iowa State University Press, Ames, 593 p.

Sokal, R.R. and F.J. Rohlf, 1969. Biometry, the Principles and Practice of Statistics in Biological Research, Freeman, San Francisco, 776 p.

BIOMETRICS - FOR 301-4

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	<u>NO. OF WEEKS</u>
UNIT 1: Introduction <ul style="list-style-type: none">- the misuse of statistics- types of biological data- frequency distributions- accuracy and significant figures	2
UNIT 2: Populations and Samples <ul style="list-style-type: none">- populations- samples from populations- random sampling- parameters and statistics	2
UNIT 3: Measure of Central Tendency <ul style="list-style-type: none">- arithmetic mean- median- mode- weighted mean- geometric mean- effect of coding data	4
UNIT 4: Measures of Dispersion and Variability <ul style="list-style-type: none">- range- mean deviation- variance- standard deviation- coefficient of variation- indices of diversity- effect of coding data	8
UNIT 5: Testing for Goodness of Fit <ul style="list-style-type: none">- chi-square goodness of fit- statistical significance- errors in hypothesis testing- bias	4
UNIT 6: Contingency Tables <ul style="list-style-type: none">- chi-square analysis- statistical significance- errors in hypothesis testing- bias	4
UNIT 7: Normal Distribution <ul style="list-style-type: none">- symmetry and kurtosis- proportions of a normal distribution- distribution of means- assessing departures from normality	

- UNIT 8: One-Sample Hypotheses 8
- two-tailed hypotheses concerning the mean
 - one-tailed hypotheses concerning the mean
 - confidence limits
 - variability about the mean
 - sample size and estimation of the population mean
 - confidence limits for the population variance
 - hypotheses concerning the variance
 - effect of coding
- UNIT 9: Two-Sample Hypotheses 8
- testing for differences between two variances
 - confidence interval for variance ratio
 - testing for differences between two means
 - confidence interval for means
 - sample size and estimation of difference between two population means
 - power and sample size
 - nonparametric statistical methods
 - effect of coding
 - testing for differences between two diversity indices
- UNIT 10: Paired-Sample Hypotheses 8
- paired sample t test
 - confidence limits for population mean difference
 - power and sample size in paired-sample testing of means
 - paired-sample testing by ranks
- UNIT 11: Multisample Hypotheses: The Analysis of Variance 8
- single factor analysis of variance
 - confidence limits for means
 - power and sample size
 - nonparametric ANOVA
 - testing for difference between several medians
 - effect of coding
 - homogeneity of variances
- UNIT 12: Multiple Comparisons 4
- Tukey test
 - Newman-Keuls test
 - confidence intervals
 - Scheff's multiple contrasts
 - nonparametric multiple comparisons
 - nonparametric multiple contrasts
 - multiple comparisons among medians
 - multiple comparisons among variances

