SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
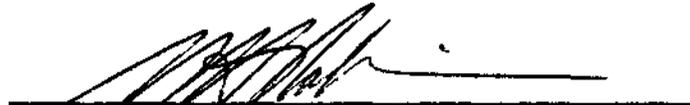
SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: APPLIED STATISTICS

Code No.: PPE 345-4

Program: WATER RESOURCES/PULP AND PAPER ENGINEERING TECHNOLOGY

Semester: FIVE

Date: JULY, 1986

Author: D. HEGGART

New: Revision:

APPROVED: _____   **ra#^^**
          Chairperson

APPLIED STATISTICS   PPE 345-4

    Course Name   Course Number

PHILOSOPHY/GOALS;

Applied Statistics is a problem-solving course in which the software
program 'MINITAB' is used. The course provides the student with an
opportunity to become more familiar with the mainframe computer. Most
of the problems are or can be applied directly to the student's main
field of study. In addition, many students will be able to apply what
they learn in this course to the manipulation of data collected in
doing their technical project.

METHOD OF ASSESSMENT (GRADING METHOD):

80%   A
70%   B
60%   C

Based on the following: Tests (including a mid-term)   60%
                            Assignments & Quizzes   40%

Applied Statistics is a continuation of MTH 255. The student is
introduced to hypothesis testing, multiple regression, chi-square and
analysis of variance. In addition to calculations done using a hand
calculator, extensive work using MINITAB software program is required.

A number of assignments are required (approximately 15-20) of which
certain ones are to be submitted for marking. These assignments
contribute to the 40% term work. A mid-term test, as well as
additional short tests and quizzes complete the evaluation.

The following outline is keyed to MINITAB Handbook, 2nd Edition, and
uses any standard statistics text as a supplement.

Students will have the option to write a final to achieve a "C" grade
or raise their grade. The final mark will be 50% of the overall
grade, while the term work will account for the remaining 50%. A
student having selected the option will have his/her grade based on
the above and may, in fact, lower their final grade by doing poorly on
the final.

ATTENDANCE; It is expected that all students at this level will have regular attendance (80%) of all theory classes and that any missed computer time will be made up by the student. Additional hours on the terminal will be required outside of those regularly scheduled.

TEXTBOOKS;

Minitab Student Handbook
Minitab Reference Manual
Statistics Text from MTH 255

APPLIED STATISTICS (PPE 345-4)

COURSE OUTLINE:

1. Introductory MINITAB commands including MEAN, MEDIA, STANDARD DEVIATION, etc.

2. Plotting data, including log plots

3. Manipulation of data using MINITAB commands such as OMIT, CHOOSE, PICK, JOIN, SAVE, etc.

4. Confidence intervals for $A*^$

5. Test of hypotheses for _••ff-

6. Comparing two means, paired t-test TWOS.

7. Application to simple hydraulic problems.

8. Analysis of chemical data.

9. Correlation and simple regression, fitting a straight line.

10. Multiple regression, interpreting residuals.

11. Transformations.

12. Analyses of variance using AOVO.

13. CHI-SQUARE TESTS AND CONTINGENCY TABLES.

14. Additional problems using combination of the above.

15. Statistical Process Control - including control charts, histograms, percentage out of specification, etc.

OBJECTIVES

Analysis of Variance

1. To analyze several sample means using Single Factor Analysis of
    Variance.

2. To set up ANOVA lables, determine F exp. and subject this value to
    critical analysis.

3. To analyze data using two-way analysis of variance.

Chi-Square and Contingency Tables

1. To present chi-square tests which provide the basis for testing
    whether more than two populations can be considered as equal.

2. To develop contingency tables of given data, and subject this data
    to chi-square.

3. To analyze expected frequencies, and determine X^2 exp, and subject
    this value to critical analysis.

Correlation, Regression and Transformations

1. To determine if there is a relationship between two parameters.

2. To calculate the value of r, and determine the reliability of this
    value.

3. To calculate the regression line for the parameters, determine the
    residuals, and analyze these residuals for simple relationships.

4. To apply the same technique to data, using multiple regression.

5. To transform the data, using simple transformations and polynominal

Hypothesis testing

1. To state the null and alternate hypothesis in a mathematical manner
    and also in a sentence.

2. To analyze data and reject or accept H .

3. To identify the two errors that can be made using sample data to
    accept or reject H .