## COURSE INFORMATION

DEPARTMENT ___SCIENCES AND MATHEMATICS___    DATE November 1, 1982

| MAT - 160 | INTRODUCTION TO STATISTICS | 3 |
|---|---|---|
| NAME & NUMBER OF COURSE | DESCRIPTIVE TITLE | SEMESTER HOURS CREDIT |

**CATALOGUE DESCRIPTION:**

An introductory course in descriptive statistics including such topics as sampling, probability, inference and hypothesis testing.  It stresses an intuitive approach and does not involve mathematical proofs.

**COURSE PREREQUISITES:** MAT 105 or instructor's permission

**COURSE COREQUISITES:**

**HOURS PER WEEK FOR EACH STUDENT.**

LECTURE ___3___ HRS.      FIELD EXPERIENCE _____
LABORATORY ___ HRS.      STUDENT DIRECTED LEARNING _____
SEMINAR ___ HRS.      OTHER (SPECIFY) Tutorial  1

TOTAL ___4___

COLLEGE CREDIT TRANSFER [ x ]      COLLEGE CREDIT NON-TRANSFER [ ]      NON-CREDIT [ ]

**TRANSFER INFORMATION**

### EQUIVALENT COURSES

UBC   Mathematics 203
SFU   Mathematics 101
OTHER

**UNASSIGNED CREDIT**
(specify if unassigned within a discipline or a faculty)

_____
COURSE DESIGNER

_____
ACADEMIC DEAN

_____
DEPARTMENT HEAD

_____ Feb. 22, 1983
REGISTRAR

Form C-1(Revised April'72)      Use blank paper for additional pages

| COURSES FOR WHICH THIS IS A PREREQUISITE: | RELATED COURSES: |
|---|---|
| | PSY 400 |

## TEXTBOOKS, REFERENCES, MATERIALS (LIST READING RESOURCES ELSEWHERE)

TEXT:  Freedman, Pisani and Purves Statistics, W.W. Norton & Co., 1978

## COURSE OBJECTIVES, CONTENT, METHOD, EVALUATION:

OBJECTIVES

Upon completion of this course, the student will have an intuitive understanding of the statistical analysis of data as applied to social, political and economic studies.  In general, the student will be able to show an understanding of the material covered in chapters 1 - 6, 8 - 11, 13, 14, 16 - 21, 23, 24, and 26 - 29, being able to answer the types of questions posed in these chapters.

1.  The student should be able to estimate the parmeters used in a particular controlled experiment or observational study.

2.  The student should be able to interpret histograms and present data in the form of histograms.

3.  The student should be able to compute the mean and standard deviation for a set of numbers.

4.  The student should be able to carry out a normal approximation for a particular histogram and test appropriateness.

5.  The student should be able to identify the types of error that occur in measured quantities.

6.  The student should be able to interpret a scatter diagram, compute the correlation coefficient and apply the regression method.

7.  The student should be able to calculate probability, expected value and standard error for a particular experiment.

8.  The student should be able to represent probability with a probability histogram.

9.  The student should be able to understand the concepts of chance, standard error, confidence interval and bias as applied to random samples.

10. The student should be able to apply Student's t-Curve to a set of measurements.

11. The student should be able to apply tests of significance to a set of data.

## CONTENTS

1. Introduction to the design of experiments
   Examples of controlled experiments and observational studies indicating
   problems in obtaining valid interpretation of data

2. Descriptive statistics
   Histogram: variables
   Average and standard deviation
   Normal approximation for data
   Measurement errors

3. Correlation and regression
   Scattergram: correlation coefficient, association or causation
   Regression: graphing, regression fallacy, residuals.

4. Probability
   Determining probability
   Independent events

5. Chance Variability
   Law of averages
   Expected value and standard error, normal curve
   Central limit theorem

6. Sampling
   Sample surveys: chance errors
   Accuracy of percentages: confidence interval
   Accuracy of averages

7. Chance Models
   Estimating the accuracy of an average
   Confidence intervals
   Student's t-Curve

8. Tests of Significance
   Null and alternative hypotheses, P-values
   Tests for averages, the chi-squared test

## METHOD

The course will proceed in the order given under "contents". Students will be
required to read assigned chapters in advance of that material being covered in
class and also work assigned problems. A significant portion of class time will
be spent in working problems for which the answers are not given in the textbook.

## EVALUATION

Will be based on   i) a mid term test
                  ii) a final examination
                 iii) at least three other assessments
Ordinarily, the final exam and mid term together are worth 50% of the overall
grade.
To obtain an overall grade of C or better, a comprehensive knowledge of the
course must be demonstrated. A satisfactory score on the final examination is
required for this purpose.