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SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: STATISTICS

CODE NO.: MTH 270-4 **SEMESTER:** IV

PROGRAM: ARCHITECTURAL/CIVIL/MECHANICAL TECHN.
ELECTRICAL/ELECTRONICS/COMPUTER

AUTHOR: J. MCGAULEY

DATE: JULY 1992 **PREVIOUS OUTLINE DATED:** JAN. 1992

APPROVED: DEAN DATE

STATISTICS . MTH 270-4

Course Name Course Number

TOTAL CREDIT HOURS: 64

PREREQUISITE(S): MTH 119 OR MTH 221

I. PHILOSOPHY/GOALS:

Statistical thinking and introduction. Summarizing data and using frequency tables, mean, median and mode, probability and probability distributions, normal, binomial and Poisson. Regression and correlation analysis. Sampling methods and sampling distribution.

II. STUDENT PERFORMANCE OBJECTIVES:

The basic objectives are that the student develop an understanding of the methods studied, demonstrate a knowledge of the facts presented and show an ability to use these in the solution of problems. To accomplish these objectives, exercises are assigned. Test questions will be of near equal difficulty to questions assigned in the exercises. The level of competency demanded is the level required to obtain an overall passing average on the tests. The material to be covered is listed below.

III. TOPICS TO BE COVERED:

1. Introduction - 1 period
2. Descriptive Statistics - 5 periods
3. Measures of Location and Variation - 8 periods
4. Probability - 8 periods
5. Probability Distributions - 12 periods
6. Sampling - 5 periods
7. Estimation - 8 periods
8. Linear Regression and Correlation - 8 periods

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IV. LEARNING ACTIVITIES:

REQUIRED RESOURCES!

1.0 INTRODUCTION

Upon successful completion of this unit the student will be able to:

1.1 Define and understand the nature of statistics

Text: Ch. 1

Read pp. 2 - 15

2.0 DESCRIPTIVE STATISTICS

Upon successful completion of this unit the student will be able to:

2.1 Understand distinction between qualitative and quantitative data

2.2 Construct and interpret frequency tables, bar graphs and pie charts

2.3 Construct and interpret frequency distributions, histograms, frequency polygons, ogives and stem and leaf displays

Text: Ch. 2

Questions:

1 - 12	pp. 28 30
13 - 20	pp. 37 39
21 - 24	pp. 42 43

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IV. LEARNING ACTIVITIES:

REQUIRED RESOURCES:

3.0 MEASURES OF LOCATION AND VARIATION

Upon successful completion of this unit the student will be able to:

3.1 Compute and interpret mean, median and mode for a set of data

3.2 Compute range, variance, standard deviation and coefficient of variation for grouped and ungrouped data

3.3 Use Z-scores, Chebyshev's Theorem and empirical rule, percentiles and quartiles

3.4 Minitab Application

Text: Ch.

Questions:

1 - 8	pp. 66 - 6 7
9 - 1 4	p. 74
15 - 18	pp. 78 & 79
19 - 22	pp. 82 & 83

4.0 PROBABILITY

Upon successful completion of this unit the student will be able to:

4.1 Compute the probability of an event from outcomes

4.2 Use rules of probability to compute the probability of events

4.3 Solve counting problems involving permutations and combinations

Text: Ch. 4

Questions:

2 - 1 3	pp. 104 -- 106
14 - 22	pp. 110 -- Ill

Problem Sheet (Handout)

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IV. LEARNING ACTIVITIES:

REQUIRED RESOURCES:

5.0 PROBABILITY DISTRIBUTIONS

Upon successful completion of this unit the student will be able to:

5.1 Understand random variables and their use

5.2 Understand the nature of probability distribution

5.3 Use and interpret Binomial distribution

5.4 Use and interpret Poisson distribution

5.5 Use and interpret Normal distribution

5.6 Minitab Application

Text: Ch.

Questions:

1 - 4	pp. 142 & 143
5 - 12	pp. 146 & 147
22 - 39	pp. 163 - 165
40 - 45	p. 168

Text: Ch,

Question: *

8 - 27	pp. 197 -- 199
28 - 33	pp. 202 -- 203

6.0 SAMPLING AND SAMPLING DISTRIBUTIONS

Upon successful completion of this unit the student will be able to:

6.1 Select random samples

6 .2 Understand characteristics and use of sampling distributions

6.3 Understand Central Limit Theorem

6.4 Use other sampling techniques

6.5 Minitab Application

Text: Ch.

Questions:

5 - 16	pp. 224 -- 225
17 - 22	pp. 233 -- 234
30 - 36	pp. 238 -- 239
37 - 48	pp. 241 -- 243

Complete reading pp. 243 - 2 46

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IV. LEARNING ACTIVITIES:

REQUIRED RESOURCES:

7.0 ESTIMATION

Upon successful completion of this unit the student will be able to:

7.1 Construct and interpret interval estimates of the population mean and population proportion

7.2 Understand confidence level

7.3 Understand the concept of sampling error

7.4 Determine sample size

7.5 Understand t-distribution

7.6 Minitab Application

Text: Ch. 8

Questions:

1 - 4	pp. 258
5 - 22	pp. 265 – 266
45 - 56	pp. 291 – 292

Text: Ch.

1 - 5	p. 311
14 - 23	pp. 317 - 318

8.0 REGRESSION AND CORRELATION

Upon successful completion of this unit the student will be able to:

8.1 Use least squares to develop a regression equation

8.2 Compute and interpret coefficient of correlation

8.3 Use regression equations for estimation and prediction

8.4 Compute and interpret sample correlation coefficient

8.5 Minitab Application

Text: Ch. 13

Questions

1 - 8	pp, 454 - 455
22 - 27	pp. 476

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V. EVALUATION METHODS: (INCLUDES ASSIGNMENTS, ATTENDANCE REQUIREMENTS ETC.)

As per the Mathematics Department Evaluation Guidelines distributed separately.

Periodic tests and daily assignments based on material in the course outline will be given during the semester. A final exam and a make-up test will be given at the discretion of the professor.

The final mark will be based on the results of several unit tests and Minitab assignments and will be determined using the following weightings:

Unit Tests	70%
Minitab Assignments	15%
Minitab Test	15%
	100%

Grading;

A+ = 90 - 100%
A = 80 - 89%
B = 65 - 79%
C = 55 - 64%
R = 0 - 54%

A passing grade will be based on a minimum average grade of 55%. Students obtaining an average grade of 45 - 55% may be allowed to write a supplementary examination;. for eligibility,.please consult the Mathematics Department Evaluation Guidelines.

VI. REQUIRED STUDENT RESOURCES

(1) Text:
Introduction to Statistics - 2nd ed.
Concepts & Applications
- Anderson, Sweeney & Williams

(2) Calculator - Recommended: Sharp Scientific Calculator EL-531P

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VII. SPECIAL NOTES:

Students with special needs (e.g. physical limitations, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor.

Your instructor reserves the right to modify the course as he/she deems necessary to meet the needs of students.