

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

**COURSE OUTLINE**

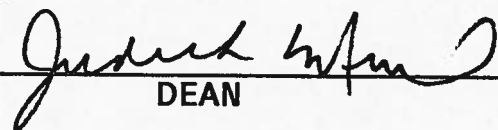

**COURSE TITLE:** STATISTICS

**CODE NO.:** MTH 255-4 **SEMESTER:** III

**PROGRAM:** FORESTRY TECHNICIAN

**AUTHOR:** J. MCGAULEY

**DATE:** JUNE 1996 **PREVIOUS OUTLINE DATED:** MAY 1995

**APPROVED:**    
DEAN DATE



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**TOTAL CREDIT HOURS: 48**

**PREREQUISITE(S): MTH 126**

**SUBSTITUTE(S): MTH 256**

**I. PHILOSOPHY/GOALS:**

Students will study statistical thinking. Topics include descriptive statistics including graphing, measures of central tendency and dispersion, probability sampling, estimation and regression analysis. Applied problems are solved using MINITAB.

**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 - 2 periods
2. Descriptive Statistics - 6 periods
3. Measures of Location and Variation - 8 periods
4. Probability - 3 periods
5. Probability Distributions - 10 periods
6. Sampling - 3 periods
7. Estimation and Hypothesis Testing- 12 periods
8. Linear Regression and Correlation - 4 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 distributions, bar graphs and pie charts**

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

Text: Ch. 2

Questions:

1 - 10

11 - 20

22 - 24

pp. 27 - 29

pp. 35 - 38

p. 45

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**IV. LEARNING ACTIVITIES:**

**REQUIRED RESOURCES:**

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**3.0 MEASURES OF LOCATION AND VARIATION**

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

Text: Ch. 3

Questions:

1 - 12

17 - 26

29 - 34

pp. 69 - 71

pp. 79 - 80

pp. 84 & 85

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

**3.2** Compute the 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

**4.0 PROBABILITY**

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

Text: Ch. 4

Questions:

1 - 18

21 - 22

31

pp. 119 - 120

p. 124

p. 131

**4.1** Compute the probability of an event from outcomes

**4.2** Use rules of probability to compute the probability of events

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**IV. LEARNING ACTIVITIES:**

**REQUIRED RESOURCES:**

**5.0 PROBABILITY DISTRIBUTIONS**

Text: Ch. 5

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

Questions:

27 - 42

50 - 62

PP. 181 - 183

PP. 187 - 188

5.1 Understand random variables and their use

Text: Ch. 6

5.2 Understand the nature of probability distribution

Question:

8 - 26

27 - 32

pp. 215 - 218

pp. 220 - 221

5.3 Know why and how to use the Binomial distribution

5.4 Know why and how to use the Poisson distribution

5.5 Know why and how to use the Normal distribution

5.6 Minitab Application

**6.0 SAMPLING AND SAMPLING DISTRIBUTIONS**

Text: Ch. 7

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

Questions:

28 - 30

34 - 42

pp. 250 - 251

pp. 255 - 256

6.1 Select random samples

6.2 Understand the characteristics and use of sampling distributions

6.3 Understand the Central Limit Theorem

6.4 Use other sampling techniques

6.5 Minitab Application

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**IV. LEARNING ACTIVITIES:**

**REQUIRED RESOURCES:**

**7.0 ESTIMATION AND HYPOTHESIS TESTING**

Text: Ch. 8

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

Questions:

1 - 14

pp. 276 - 277

15 - 22

pp. 284 - 285

27 - 36

pp. 288 - 289

45 - 56

pp. 303 - 305

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

Text: Ch. 9

**7.2** Understand confidence level

1 - 14

pp. 347 - 349

**7.3** Understand the concept of sampling error

16 - 28

pp. 354 - 355

34 - 44

pp. 359 - 360

**7.4** Determine sample size

**7.5** Understand t-distribution

**7.6** Conduct hypothesis tests about a population mean or a population proportion.

**7.7** Minitab Application

**8.0 REGRESSION AND CORRELATION**

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

Text: Ch. 13

**8.1** Use least squares to develop a regression equation

Questions:

1 - 8

pp. 507 - 509

**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

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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 - 3rd ed., Concepts & Applications - Anderson, Sweeney & Williams

(2) Calculator - (Recommended) Sharp Scientific Calculator EL-531G. The use of some kinds of calculators may be restricted during tests.



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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.

