

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: STATISTICS

CODE NO.: MTH 655-4 SEMESTER IV

PROGRAM: AVIATION TECHNOLOGY

AUTHOR J. MCGAULEY

DATE: "AK. 1992 PREVIOUS OUTLINE DATED AUG. 1988

APPROVED:



DtLAN"

LE^j/P^
DATE

■

•

t

STATISTICS

MTH 655-4

Course Name

Course Number

TOTAL CREDIT HOURS: 64

PREREQUISITE(S): MTH 612

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 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 - 6 periods
4. Probability - 6 periods
5. Probability Distributions - 8 periods
6. Sampling - 5 periods
7. Estimation and Hypothesis Testing - 16 periods
8. Linear Regression and Correlation - 8 periods

STATISTICS

MTH 655-4

Course Name

Course Number

IV. LEARNING ACTIVITIES

REQUIRED RESOURCES

1.0 INTRODUCTION

Text: Ch. 1

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

Read pp. 2 - 15

1.1 Define and understand the nature of statistics

2.0 DESCRIPTIVE STATISTICS

Text: Ch. 2

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

Questions:

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

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



t

STATISTICS

MTH 655-4

Course Name

Course Number

IV LEARNING ACTIVITIES

REQUIRED RESOURCES:

3.0 MEASURES OF LOCATION AND VARIATION

Text: Ch.

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

Questions:

- 1 - 8 pp. 55 - 67
- 9 - 14 p. 74
- 15 - 18 pp. 78 & 79
- 19 - 22 pp. 82 & 83

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

4.0 PROBABILITY

Text Ch

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

Questions:

- 2 - 13 pp 104 106
- 14 - 22 pp 110 111

Problem Sheet

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

t

STATISTICS

MTH 655-4

Course Name

Course Number

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:

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

5.1 Understand random variables and their use

Text Ch

5.2 Understand the nature of probability distribution

Question:

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

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

6.0 SAMPLING AND SAMPLING DISTRIBUTIONS

Text Ch. 7

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

Questions:

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

6.1 Select random samples

Complete reading pp. 243 - 246

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

t

STATISTICS

MTH 655-4

Course Name

Course Number

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 - 4	pp. 258	
5 - 22	pp. 265	266
23 - 36	pp. 279	281
45 - 56	pp. 291	292

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

Text Ch. 9

7.2 Understand confidence level

1 - 1	p. 311	
14 - 23	pp. 317 -	318
24 - 31	p. 322	

7.3 Understand the concept of sampling error

Text Ch. 10

7.4 Determine sample size

1 - 6	pp. 337	339
7 - 11	pp. 343	345
12 - 15	pp. 348	349
16 - 23	pp. 355	357

7.5 Understand t-distribution

7.6 Conduct tests of hypothesis concerning a population mean and a population proportion

7.7 Minitab Application

STATISTICS**MTH 655-4**

Course Name

Course Number

IV, LEARNING ACTIVITIES:**REQUIRED RESOURCES:**8.0 REGRESSION AND
CORRELATION

Text: Ch. 13

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

Questions:

1 - 8

pp. 454 - -155

22 - 27

pp. 476

- 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

t

STATISTICS

MTH 655-4

Course Name

Course Number

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	80%
Minitab Assignments	10%
Minitab Test	10%
	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

STATISTICS

MTH 655-4

Course Name

Course Number

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.