UNIVERSITY COLLEGE of the FRASER VALLEY

PAC FORM #2 (Page 1)

COURSE IMPLEMENTATION DATE:	September 1994
COURSE REVISED IMPLEMENTATION DATE:	September 2003
COURSE TO BE REVIEWED:	September 2007
(Four years after implementation date)	(MONTH YEAR format)

OFFICIAL COURSE OUTLINE INFORMATION

Students are advised to keep course outlines in personal files for future use.

Shaded headings are subject to change at the discretion of the department and the material will vary - see course syllabus available from instructor

FACULTY/DEPARTMENT: **MATHEMATICS and STATISTICS**

MATH 270		**4**
COURSE NAME/NUMBER	FORMER COURSE NUMBER	UCFV CREDITS

INTRODUCTION TO PROBABILITY and STATISTICS

COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

An introduction to the theory and practice of statistics for engineering, science and mathematics students who have experience with calculus. Topics include descriptive statistics elementary probability theory, expectation and variance of random variables, bionomial, hypergeometric, Poisson, exponential and normal distributions, sampling distributions, confidence intervals and hypothesis tests for means and proportions, tests of goodness-of-fit and independence, correlation, simple linear regression.

PREREQUISITES: **MATH 112, or a C or better in MATH 116**
COREQUISITES: **None**

SYNONYMOUS COURSE(S)
(a) Replaces: **N/A** *(Course #)*
(b) Cannot take: **N/A** *(Course #)* for further credit.

SERVICE COURSE TO: *(Department/Program)* *(Department/Program)*

TOTAL HOURS PER TERM: **75**

STRUCTURE OF HOURS:

Lectures:	**45**	Hrs
Seminar:		Hrs
Laboratory:	**30**	Hrs
Field Experience:		Hrs
Student Directed Learning:		Hrs
Other (Specify):		Hrs

TRAINING DAY-BASED INSTRUCTION
LENGTH OF COURSE: **n/a**
HOURS PER DAY: **n/a**

MAXIMUM ENROLLMENT: **36**
EXPECTED FREQUENCY OF COURSE OFFERINGS:

WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only)	☒ Yes	☐ No
WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department)	☐ Yes	☐ No
TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:	☒ Yes	☐ No

AUTHORIZATION SIGNATURES:

Course Designer(s): Department Curriculum Committee
Chairperson: Greg Schlitt *(Curriculum Committee)*
Department Head: Greg Schlitt
Dean: Jackie Snodgrass
PAC Approval in Principle Date:
PAC Final Approval Date: December 4, 2002

LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:

Successful students will be able to:

1. summarize uni-variate data graphically and numerically
2. understand the notion of variation in data
3. summarize bi-variate data
4. derive, manipulate and apply fundamental formulae and use in probability
5. calculate and use measures of location and spread for a variety of discrete and continuous random variables
6. recognize binomial, hypergeometric, Poisson and exponential random variables and complete problems requiring calculation of binomial, hypergeometric, Poisson, exponential and normal probabilities
7. understand and use the Central Limit Theorem and other rules for sampling distributions
8. conduct and interpret elementary inferential procedures for means, proportions, variances and Poisson rates
9. understand the philosophy of hypothesis testing to the extent that results of more sophisticated tests can be interpreted without detailed knowledge of the technique used
10. build simple linear regression models, use them for estimation and perform relevant inferential procedures
11. express discrete bi-variate distributions and calculate covariances, correlations and conditional means
12. test whether data have a specific distribution
13. test whether two variables are associated

METHODS:

Classroom lectures. Evaluation includes assignments, tests and a three-hour comprehensive examination. Some assignments require use of statistical computer software and/or graphing calculators.

PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

Credit can be awarded for this course through PLAR (Please check :) ☒ Yes ☐ No

METHODS OF OBTAINING PLAR:

Course Challenge

TEXTBOOKS, REFERENCES, MATERIALS:

[Textbook selection varies by instructor. An example of texts for this course might be:]

The text is chosen by departmental curriculum committee.

Jay Devore, Probability and Statistics for Engineering and the Sciences, Fifth Edition, Duxbury.

SUPPLIES / MATERIALS:

A graphing calculator is required.

STUDENT EVALUATION:

[An example of student evaluation for this course might be:]

The weighting of the components may vary amongst instructors and years. There have to be at least two tests. The final examination has to be comprehensive and has to be worth 40 – 50%. A student must obtain at least 40% on the final exam to pass the course.

A typical breakdown is as follows:

Assignments	20%
Tests	35%
Examination	45%

COURSE CONTENT:

[Course content varies by instructor. An example of course content might be:]

Descriptive statistics for samples and finite populations: frequency tables, histograms and other graphical representations, mean,

median, variance, standard deviation, percentiles. Means and standard deviations of functions of variables.

Probability: events, axioms, counting rules, conditional probability, independence, Bayes Theorem

Discrete distributions: probability mass functions, mean, variance, binomial, negative binomial, hypergeometric and Poisson random variables

Continuous distributions: density functions, mean, variance, mean and variance of linear combinations of continuous random variables, normal and exponential random variables

Joint probability distributions, covariance and correlation in terms of expectation, conditional mean, mean and variance of a linear combination of variables, regression

Statistics and their distributions: the Central Limit Theorem and other rules

Introduction to the chi-squared, *t* and *F* distributions without proofs

Inference for means, proportions variances and Poisson rates

Chi-squared tests for goodness of fit and association

The simple linear regression model, sample correlation, least squares estimation for simple linear regression, the ANOVA table. Linear regression as the minimization of the Mean Square Error
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