UNIVERSITY OF THE FRASER VALLEY

COURSE IMPLEMENTATION DATE:	September 1994
COURSE REVISED IMPLEMENTATION DATE:	September 2009
COURSE TO BE REVIEWED:	May 2013
(four years after UPAC approval)	*(month, year)*

OFFICIAL UNDERGRADUATE 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 – see course syllabus available from instructor

COURSE NAME/NUMBER	FACULTY/DEPARTMENT	UFV CREDITS
MATH 270	Math & Stats	4

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, uniform, normal and exponential 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
COREQUISITES: None
PRE or COREQUISITES:

SYNONYMOUS COURSE(S):
(a) Replaces: N/A
(b) Cross-listed with: N/A
(c) Cannot take: ______ for further credit.

SERVICE COURSE TO: *(department/program)*

TOTAL HOURS PER TERM: 75

STRUCTURE OF HOURS:

Lectures:	50	Hrs
Seminar:		Hrs
Laboratory:	25	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

OTHER:
Maximum enrolment: 36
Expected frequency of course offerings: Annually
(every semester, annually, every other year, etc.)

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

Course designer(s): Stats Committee

Department Head: Greg Schlitt	Date approved:
Supporting area consultation (UPACA1)	Date of meeting: **February 13, 2009**
Curriculum Committee chair: Norm Taylor	Date approved: **May 2009**
Dean/Associate VP: Dan Ryan	Date approved: **May 1, 2009**
Undergraduate Program Advisory Committee (UPAC) approval	Date of meeting: **May 22, 2009**

LEARNING OUTCOMES:

Upon successful completion of this course, students will be able to:
1. summarize and describe the pattern of uni-variate and bi-variate data graphically and numerically;
2. derive, manipulate and apply fundamental formulae and use in probability;
3. calculate and use measures of location and spread for a variety of discrete and continuous random variables;
4. recognize binomial, hypergeometric, negative binomial, Poisson, uniform, normal and exponential random variables and solve problems requiring calculation of the respective probabilities;
5. understand and use the Central Limit Theorem for sampling distributions;
6. construct and interpret confidence intervals for means and proportions;
7. generalize the philosophy of hypothesis testing to the extent that results of more sophisticated tests can be interpreted withoutdetailed knowledge of the technique used for means and proportions including, P-values;
8. build simple linear regression models, use them for estimation, and perform relevant inferential procedures;
9. express discrete bi-variate distributions and calculate covariances, correlations and conditional means;
10. test whether data have a specific distribution;
11. test whether two variables are associated.

METHODS: *(Guest lecturers, presentations, online instruction, field trips, etc.)*

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

METHODS OF OBTAINING PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

☐ Examination(s) ☐ Portfolio assessment ☐ Interview(s)

☒ Other (specify): Course Challenge

☐ PLAR cannot be awarded for this course for the following reason(s):

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, Seventh 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: 10%
Quizzes 15%
Tests 35%
Examination 40%

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, percentile. 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: probability density functions, mean, variance, 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

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

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

Confidence intervals and tests of hypotheses for means and proportions

Chi-squared tests for goodness of fit and independence.

The simple linear regression model, Pearson sample correlation coefficient, least squares estimation, coefficient of determination, the ANOVA table and model utility test. Linear regression as the minimization of the Mean Square Error