UNIVERSITY OF THE FRASER VALLEY

OFFICIAL UNDERGRADUATE COURSE OUTLINE (page 1)

COURSE IMPLEMENTATION DATE:	September 1990
COURSE REVISED IMPLEMENTATION DATE:	September 2012
COURSE TO BE REVIEWED:	December 2014
(six years after UEC 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

MATH 106	SCIENCE/MATH & STATS	4
COURSE NAME/NUMBER	FACULTY/DEPARTMENT	UFV CREDITS

STATISTICS I

COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

This course is an introduction to descriptive statistics, sampling, probability, estimation, hypothesis testing, correlation, regression, and analysis of variances. This course is similar to MATH 104, but includes multiple regression, one-way ANOVA, and a more detailed discussion of probability results. Facility with Grade 12 level algebra is expected, but no calculus is required. As a general rule, students with Math 11 are expected to take MATH 104, those with Math 12 are expected to take MATH 106, and those with a full year of calculus are expected to take MATH 270.

Before registering, students should check the requirements of their program. UFV mathematics degrees require MATH 270. While MATH 106 is not equivalent to MATH 270, students with credit for MATH 270 are not allowed to take MATH 106. Those with credit for MATH 106 may subsequently take MATH 270 in order to satisfy the requirements for a math degree.

PREREQUISITES: One of the following: C or better in one of Principles of Mathematics 12, Applications of Mathematics 12, Foundations of Mathematics 12, Pre-calculus 11, MATH 110, MATH 124, or MATH 140; or C or better in both MATH 094 and MATH 095; or Pre-calculus 12; or a score of 17/25 or better on Part B of the MSAT together with a score of 34/50 or better on Parts A and B combined.

COREQUISITES: None

PRE or COREQUISITES:

SYNONYMOUS COURSE(S):

(a) Replaces: **N/A**

(b) Cross-listed with:

(c) Cannot take: **See above** for further credit.

SERVICE COURSE TO: *(department/program)*

Business Administration

Biology

TOTAL HOURS PER TERM: **60**

STRUCTURE OF HOURS:

Lectures:	**60**	Hrs
Seminar:		Hrs
Laboratory:		Hrs
Field experience:		Hrs
Student directed learning:		Hrs
Other (specify):		Hrs

TRAINING DAY-BASED INSTRUCTION:

Length of course:

Hours per day:

OTHER:

Maximum enrolment: **36**

Expected frequency of course offerings: Every semester

(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:	**December 15, 2011**
Supporting area consultation (Pre-UEC)		Date of meeting:	**February 3, 2012**
Curriculum Committee chair:	**Norm Taylor**	Date approved:	**January 27, 2012**
Dean/Associate VP:	**Ora Steyn**	Date approved:	**February 10, 2012**
Undergraduate Education Committee (UEC) approval		Date of meeting:	**March 2, 2012**

LEARNING OUTCOMES:

Upon successful completion of this course, students will be able to:

1. Construct frequency tables, histograms and cumulative frequency diagrams, scatter diagrams, and regression lines from raw data by the use of appropriate technology;
2. Obtain simple measures of location and dispersion, correlation, and regression from the data, and interpret the same;
3. Solve simple problems in probability requiring knowledge of conditional probability and statistical independence;
4. Use simple mathematical models for commonly occurring situations such as sampling with replacement, and commercial or biological measurements;
5. Apply Pearson's chi-square statistic to draw inferences in appropriate categorical sampling situations;
6. Apply and interpret multiple regression models and the associated Analysis of Variance (ANOVA) tables;
7. Use indicator (dummy) variables with categorical data so to apply the methods of multiple regression.

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

Lectures, mixed with sessions in the computer lab.

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. Examples for this course might be:]*

The text is chosen by a departmental curriculum committee. Recent text:
McClave and Sincich. Statistics. 8th edition. Prentice-Hall.

SUPPLIES / MATERIALS:

A scientific calculator with statistical functions is required.

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

Assignments and quizzes	20-30%
Mid-term examinations (2)	30-40%
Final examination	40-45%

Students must achieve at least 40% on the final exam in order to receive credit for this course.

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

1. Introduction to statistical concepts, e.g. variation; and software, e.g. MINITAB, Excel, Quattro-Pro.
2. Descriptive statistics:
   Frequency tables, histograms, cumulative frequencies, etc.
   Measures of location, e.g. mean, median, mode; and scale, e.g. standard deviation, quantiles.
   Linear transformations.
   Bivariate data, correlation, linear regression, least squares, the analysis of variance table, interpretation of computer output.
3. Probability:
   Two-way tables, Venn and tree diagrams; joint, marginal and conditional probability.
   Independence and dependence. Bayes' Theorem.
   Counting rules.
   Simple models for discrete random variables, sampling with and without replacement.
   Expectation, mean, variance and standard deviation.
   The normal distribution, standardization, linear transformations.
   The chi-square probability distribution.
   Random sampling, simulation, especially as applied to limit theorems, e.g. the Central Limit Theorem.
4. Inferential statistics: estimation, confidence intervals and tests of hypothesis.
   These techniques applied to proportions, rates and means for one and two populations.
   Pearson's chi-square statistic applied to a variety of problems, e.g. goodness-of-fit, independence in a two-way table, equality of binomial proportions, comparison of related proportions, comparison of rates.
   The Student 't' and Fisher's 'F' probability distributions.
   Comparison of the means of several populations the one-way ANOVA table.
   Confidence intervals and test of hypothesis about the slope in simple linear regression.
   Multiple regression, interpretation of the equation, R-square, the ANOVA table