UNIVERSITY OF THE FRASER VALLEY

ORIGINAL COURSE IMPLEMENTATION DATE: September 1993
REVISED COURSE IMPLEMENTATION DATE: January 2021
COURSE TO BE REVIEWED: (six years after UEC approval) September 2023
Course outline form version: 09/15/14

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: STAT 104	**Number of Credits:** 4 Course credit policy (105)
Course Full Title: Introductory Statistics **Course Short Title (if title exceeds 30 characters):**	
Faculty: Faculty of Science	**Department (or program if no department):** Mathematics & Statistics

Calendar Description:

A basic introduction to descriptive statistics, probability, sampling, estimation, hypothesis testing, correlation, and regression. Recommended for anyone who wishes to evaluate research involving statistical analysis, especially students in humanities and social science. Using statistical computer software is essential to this course.

Note: As a general rule, students with Mathematics 11 are prepared to take STAT 104, those with Mathematics 12 are prepared to take STAT 106, and those with a full year of calculus are prepared to take STAT 270/MATH 270. Before registering, students should check the requirements of their program. The UFV Mathematics major program requires STAT 270, while the Mathematics minor program requires STAT 106 or STAT/MATH 270.
Note: Some degree and diploma credentials may allow only one of STAT 104 or STAT 106 to count as credit towards meeting program requirements.

Prerequisites (or NONE):	One of the following: (C or better in one of Principles of Mathematics 11, Applications of Mathematics 11, MATH 085, Foundations of Mathematics 11, or Pre-calculus 11) or (B or better in Workplace Mathematics 11 or History of Mathematics 11) or (C or better in Calculus 12 or Statistics 12) or (B or better in Apprenticeship Mathematics 12 or Apprenticeship and Workplace Mathematics 12) or (one of Foundations of Mathematics 12, Pre-calculus 12, Principles of Mathematics 12, or Applications of Mathematics 12) or (any UFV MATH course numbered 092 or higher) or (a score of 17/25 or better on Part A of the MSAT) or (45 university-level credits with department permission).

Equivalent Courses (cannot be taken for additional credit)

Former course code/number: **MATH 104**

Cross-listed with:

Equivalent course(s): *Note: Equivalent course(s) should be included in the calendar description by way of a note that students with credit for the equivalent course(s) cannot take this course for further credit.*

Transfer Credit

Transfer credit already exists: ☒ Yes ☐ No

Transfer credit requested (OReg to submit to BCCAT):
☒ Yes ☐ No (if yes, fill in transfer credit form)

Resubmit revised outline for articulation: ☐ Yes ☒ No

To find out how this course transfers, see **bctransferguide.ca**.

Total Hours: 60

Typical structure of instructional hours:

Lecture hours	40
Seminars/tutorials/workshops	
Laboratory hours	20
Field experience hours	
Experiential (practicum, internship, etc.)	
Online learning activities	
Other contact hours:	
Total	**60**

Special Topics

Will the course be offered with different topics?
☐ Yes ☒ No

If yes, different lettered courses may be taken for credit:
☐ No ☐ Yes, repeat(s) ☐ Yes, no limit

Note: The specific topic will be recorded when offered.

Maximum enrolment (for information only): 36

Expected frequency of course offerings (every semester, annually, every other year, etc.): Every semester.

Department / Program Head or Director: Ian Affleck	**Date approved:**	May 2020
Faculty Council approval	**Date approved:**	May 29, 2020
Dean/Associate VP: Lucy Lee	**Date approved:**	May 29, 2020
Campus-Wide Consultation (CWC)	**Date of posting:**	June 26, 2020

Undergraduate Education Committee (UEC) approval	**Date of meeting:** October 2, 2020

Learning Outcomes

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

1. Construct histograms, boxplots, and other graphs from raw data, and interpret these graphs.
2. Obtain simple measures of location and dispersion from the data, and interpret the same.
3. Calculate the correlation between two linearly related variables, and obtain, use, and interpret lines of "best" fit.
4. Solve simple problems in probability requiring knowledge of conditional probability and statistical independence.
5. Use simple mathematical models for commonly occurring situations such as sampling with replacement, and physical or biological measurements.
6. Solve simple problems involving the distribution of the sample mean.
7. Construct and interpret confidence intervals for means and proportions and for differences in means, and check the conditions for inference in these cases.
8. Conduct tests of hypotheses for means and proportions and for differences in means, interpret p-values, check conditions for inference in these cases.
9. Draw inferences using linear regression.
10. Apply Pearson's chi-square statistic to draw inferences in appropriate categorical sampling situations.
11. Identify sources of potential bias in data and be able to obtain their own random samples.
12. Use statistical software for calculations and graphs throughout the course.

Prior Learning Assessment and Recognition (PLAR)

☒ Yes ☐ No, PLAR cannot be awarded for this course because

Typical Instructional Methods (guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion)

A calculator is required.

Grading system: Letter Grades: ☒ Credit/No Credit: ☐ Labs to be scheduled independent of lecture hours: Yes ☐ No ☒

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Typical Text(s) and Resource Materials (if more space is required, download Supplemental Texts and Resource Materials form)

	Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	Year
1.	Moore, D.S., Notz, W.I. & Fligner, M.A.	The Basics Practice of Statistics, 7TH Edition	☒	Freeman	2015
2.			☐		
3.			☐		
4.			☐		
5.			☐		

Required Additional Supplies and Materials (software, hardware, tools, specialized clothing, etc.)

Typical Evaluation Methods and Weighting

Final exam:	40%	Assignments:	10%	Midterm exam:	30%	Practicum:	%
Quizzes/tests:	20%	Lab work:	%	Field experience:	%	Shop work:	%
Other:	%	Other:	%	Other:	%	Total:	100%

Details (if necessary):

Typical Course Content and Topics

1. Introduction to statistical concepts, e.g. variation; and software, e.g. MINITAB, Excel, SPSS.
2. Descriptive statistics: Use statistical software to obtain histograms, stem-and-leaf plots, boxplots, etc. Measures of location, e.g. mean, median, mode; and scale, e.g. standard deviation, quartiles. Bivariate data: use statistical software to obtain correlation, linear regression line, use and interpret computer output.
3. Probability: Two-way tables, Venn and tree diagrams; joint, marginal and conditional probability. Independence and dependence. Simple models for discrete random variables, sampling with and without replacement. The normal distribution, standardization application of Central Limit Theorem.
4. Inferential statistics: Estimation, confidence intervals and tests of hypothesis for means, proportions and differences of means; p-values; conditions for inference. Pearson's chi-square statistic applied to a variety of problems, e.g. goodness-of-fit, testing for independence in a two-way table. Confidence intervals and test of hypothesis about the slope in simple linear regression.
5. Bad sampling designs (eg voluntary response samples, convenience samples) and other sources of error in data, use random number table to obtain simple random samples.
6. If time allows: simple experimental design.