UNIVERSITY OF THE FRASER VALLEY

ORIGINAL COURSE IMPLEMENTATION DATE: November 1993
REVISED COURSE IMPLEMENTATION DATE: September 2024
COURSE TO BE REVIEWED (six years after UEC approval)**:** October 2029
Course outline form version: 28/10/2022

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

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

Course Code and Number: PSYC 301	**Number of Credits:** 3 Course credit policy (105)
Course Full Title: Intermediate Quantitative Methods and Statistical Inference in Psychology **Course Short Title:** Quant Methods & Stat Inference	
Faculty: Faculty of Social Sciences	**Department (or program if no department):** Psychology

Calendar Description:

An extension of the basic theory and methods underlying research design, data analysis, and statistical inference. Students learn the logic of quantitative methods, both descriptive and inferential in nature. They also apply this logic to research scenarios using statistical software and interpret the results of inferential tests.

Prerequisites (or NONE):	PSYC 202.
Corequisites (if applicable, or NONE):	
Pre/corequisites (if applicable, or NONE):	

Antirequisite Courses *(Cannot be taken for additional credit.)*

Former course code/number:

Cross-listed with:

Equivalent course(s):

(If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.)

Typical Structure of Instructional Hours

Lecture/seminar	30
Tutorials/workshops	15
Total hours	**45**

Scheduled Laboratory Hours

Labs to be scheduled independent of lecture hours: ☒ No ☐ Yes

Course Details

Special Topics course: **No**
(If yes, the course will be offered under different letter designations representing different topics.)

Directed Study course: **No**
(See policy 207 for more information.)

Grading System: **Letter grades**

Delivery Mode: **May be offered in multiple delivery modes**

Expected frequency: **Winter only**

Maximum enrolment (for information only)**: 25**

Prior Learning Assessment and Recognition (PLAR)

PLAR is available for this course.

Transfer Credit *(See **bctransferguide.ca**.)*

Transfer credit already exists: **Yes**

Submit outline for (re)articulation: **No**
(If yes, fill in transfer credit form.)

Department approval	**Date of meeting:**	April 20, 2021
Faculty Council approval	**Date of meeting:**	August 31, 2023
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	October 27, 2023

Learning Outcomes *(These should contribute to students' ability to meet program outcomes and thus Institutional Learning Outcomes.)*

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

1. Perform descriptive analyses (involving both numerical and graphical summaries of data) using statistical software (e.g., SPSS).
2. Apply appropriate statistical inferential tools in the context of various research designs (e.g., correlational, quasi-experimental, experimental, repeated measures).
3. Perform inferential analyses (involving *t*- and *F*- distributions) using statistical software (e.g., SPSS).
4. Interpret the results of statistical hypothesis tests involving univariate, bivariate, and multivariate distributions using the techniques of ANOVA and regression.
5. Illustrate, both in writing and in application, mastery of fundamental statistical concepts including sampling distributions, effect sizes, confidence intervals, and p-values.
6. Implement the logic of null hypothesis testing in making sound inferential arguments when applying statistical tools.
7. Justify, in writing, the making of sound analytical decisions in the process of running a hypothesis test (e.g., dealing with violated assumptions, imbalanced designs, outliers).

Recommended Evaluation Methods and Weighting *(Evaluation should align to learning outcomes.)*

Final exam:	35%	Assignments:	30%		%
Quizzes/tests:	35%		%		%

Details:

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

Typical Instructional Methods *(Guest lecturers, presentations, online instruction, field trips, etc.)*

Lectures, laboratory activities.

Texts and Resource Materials *(Include online resources and Indigenous knowledge sources. Open Educational Resources (OER) should be included whenever possible. If more space is required, use the Supplemental Texts and Resource Materials form.)*

	Type	Author or description	Title and publication/access details	Year
1.	Textbook	Howell, David, C.	Statistical Methods for Psychology / Bookstore access	2013
2.	OER book	Tafreshi, D.	Intermediate Statistics for Psychology	2023
3.				
4.				
5.				

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

Statistical software (e.g., SPSS, *R*).

Course Content and Topics

- Review of basic statistical concepts, probability, algebra, and notation
- Review of descriptive statistics/data analysis, including limitations of measurement practices.
- Review of sampling distributions and the logic of Neyman-Pearsonian null hypothesis testing
- Effect sizes and confidence intervals, including effect size specification vs. magnitude of effect estimation
- One-way analysis of variance (ANOVA)
- Type II error control (power analyses)
- Simultaneous inference (post-hoc comparisons)
- Two-way between subjects ANOVA
- Repeated measures (within-subject) ANOVA
- Simple linear regression & correlation
- Multiple linear regression
- Special issues pertaining to null-hypothesis testing and alternative methods of inference