NORTHWESTERN POLYTECHNIC

DEPARTMENT Humanities and Social Sciences

COURSE OUTLINE – Fall 2024

PY2110(A2): Statistical Methods for Psychological Research – 4 (3-0-1) 60 Hours for 15 Weeks

Northwestern Polytechnic acknowledges that our campuses are located on Treaty 8 territory, the ancestral and present-day home to many diverse First Nations, Metis, and Inuit people. We are grateful to work, live and learn on the traditional territory of Duncan's First Nation, Horse Lake First Nation and Sturgeon Lake Cree Nation, who are the original caretakers of this land.

We acknowledge the history of this land and we are thankful for the opportunity to walk together in friendship, where we will encourage and promote positive change for present and future generations.

INSTRUCTOR:	Dr. Bruce Galenza (he/him)	**PHONE:**	780-539-2994
OFFICE:	C403	**E-MAIL:**	bgalenza@nwpolytech.ca
OFFICE HOURS:	Tues & Thurs: 10 – 11:30		

CALENDAR DESCRIPTION: The course provides: an application of statistical methods to psychological problems; description of data in terms of averages, measures of variability and measures of relationships; correlation and regression; problems of sampling theory and statistical tests of hypothesis. Greater emphasis will be placed upon understanding the relevant principles than upon performing the mathematical calculations.

PREREQUISITE(S)/COREQUISITE:

PY1040 (3) and Mathematics 30 or equivalent; or permission of the department

REQUIRED TEXT/RESOURCE MATERIALS: Gravetter, F. & Wallnau, L. (2013). Statistics for the behavioural sciences (9th Edition). Wadsworth Thomson Learning.

The study guide is available and useful but not required. Get a simple statistics calculator and bring it every day. (A statistics calculator is one that has σ and $\sum$ on it. Not much else will be needed.)

DELIVERY MODE(S): On-Campus lecture and lab

LEARNING OUTCOMES: As a result of taking this course, students will gain the ability to:

1. Verbally define, explain, and present the purpose and rationale for using the above statistical concepts.
2. Calculate answers for given questions using the appropriate formulae both by hand and by SPSS computer programs.

3. Present answers to lab assignments in an organized and readable manner.

COURSE OBJECTIVES:

1. Elements within the scientific method, particularly variables, measurement, and scales.
2. Graphic representations such as frequency distributions, tables, and charts to summarize and describe collected data.
3. Measures of percentiles, percentile points, central tendency (means, medians, modes) and variability (sums of squares, variances, standard deviations, ranges, interquartile ranges) for both populations and samples.
4. Standardized or z-score distributions and percentages under the normal curve.
5. Probability theory, sampling theory, and sampling distributions of scores and of means, standard error.
6. Hypothesis testing principles, null and alternative distributions, significance of outcomes, Type I and II errors, power.
7. T-tests (Student's t, independent, and repeated measures) ANOVAs (independent and repeated), factorial designs, and interactions.
8. Correlations, coefficients, scatter plots, regression lines, standard errors of estimate, and the relations between these concepts.
9. Non-parametric statistics.

TRANSFERABILITY:

Please consult the Alberta Transfer Guide for more information. You may check to ensure the transferability of this course at the Alberta Transfer Guide main page http://www.transferalberta.ca.

** Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions. **Students are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability.**

EVALUATION: Research psychology recognizes the authority of, and bases its judgements on, carefully collected data, as opposed to opinion, tradition, or authority. Psychology always makes its decisions by measuring and comparing, and so shall I. In keeping with this philosophy: rather than me imposing my authority on you and telling you what you must know and then arbitrarily assigning cut-off points for grades through non-standardized tests, you as a class will inform me what you are capable of, through my careful measurement of your performance. Students will be assessed blindly and according to their relative

position within the class. This method will be explained fully in the first class period; a handout is available if requested.

Assessment will be based on four examinations/assignment combinations, weighted at 20%, 25%, 25%, and a 30% final examination. 5% of each exam will be a lab assignment. Following the final grade assignments, students will be subjectively assessed for bonus points on the basis of their involvement in, and contributions to, the class and in-class work, as well as attendance.

GRADING CRITERIA:
Please note that most universities will not accept your course for transfer credit **IF** your grade is **less than C-**.

Alpha Grade	4-point Equivalent	Expected Percentage of Class Receiving		Alpha Grade	4-point Equivalent	Expected Percentage of Class Receiving
A+	4.0	2%		C+	2.3	16%
A	4.0	3%		C	2.0	13%
A-	3.7	7%		C-	1.7	9%
B+	3.3	9%		D+	1.3	7%
B	3.0	13%		D	1.0	3%
B-	2.7	16%		F	0.0	2%

The Percentage Guidelines listed above will obtain only if a perfectly normal distribution results. Deviations from the assumptions of normality will result in modified percentages. In short, this grading technique is NOT grading on the curve.

TENTATIVE TIMETABLE:

1. Elements within the scientific method, particularly variables, measurement, and scales. Sept 4-9.
2. Graphic representations such as frequency distributions, tables, and charts to summarize and describe collected data. Sept 11-16.
3. Measures of percentiles, percentile points, central tendency (means, medians, modes) and variability (sums of squares, variances, standard deviations, ranges, interquartile ranges) for both populations and samples. Sept 18-23
4. Elements within the scientific method, particularly variables, measurement, and scales. Sept 25-30.
5. Graphic representations such as frequency distributions, tables, and charts to summarize and describe collected data. Oct 2-7.
6. Measures of percentiles, percentile points, central tendency (means, medians, modes) and variability (sums of squares, variances, standard deviations, ranges, interquartile ranges) for both populations and samples. Oct 9-14.

7. Standardized or z-score distributions and percentages under the normal curve. Oct 16-21.
8. Probability theory, sampling theory, and sampling distributions of scores and of means, standard error. Oct 23-28.
9. Hypothesis testing principles, null and alternative distributions, significance of outcomes, Type I and II errors, power. Oct 30-Nov 11.
10. T-tests (Student's t, independent, and repeated measures) ANOVAs (independent and repeated), factorial designs, and interactions. Nov 13-25
11. Correlations, coefficients, scatter plots, regression lines, standard errors of estimate, and the relations between these concepts. Nov 27 – Dec 4.
12. Non-parametric statistics. Dec 9-11.

STUDENT RESPONSIBILITIES:

The assigned readings and exercises for each class should be completed before attending that class, except for the first class. As this course will depend heavily practice exercises, attendance at all sessions is required and is critical to the student's success in the course. Missing classes is generally fatal for most students. In case of illness or emergency, notify the instructor as soon as possible. If you find yourself having difficulty in this course, please contact the instructor immediately for assistance. If you simply want more discussion with the instructor about any aspect of the course, please visit my office during office hours or at a more convenient pre-arranged time. Many students find statistics difficult, but all the help you require is available.

This is adult education. You will be treated as such and are expected to behave accordingly. It is expected that all students will display a professional attitude and behaviour in the classroom. This includes reliability, respect for and cooperation with your fellow students and the instructor, attention to fellow students' questions and instructors' responses, determination to achieve first-class work while meeting deadlines, and constructive response to criticism. Engaging in cell phone behaviour will result in you being asked to leave the classroom.

A GENTLE WARNING: As some of this work is unsupervised lab work, it is very easy to cheat by copying someone else's computer printouts and handing it in under your name. Be forewarned, however, that we have ways of determining from which computer account a printout has originated. Also, as the exam questions mirror the assignments, doing your own assignments independently will help your exams a great deal. If you cheat in any way, penalties will be pursued, potentially including a zero for the paper, an "F" for the term, and suspension from the institution.

STATEMENT ON ACADEMIC MISCONDUCT:

Academic Misconduct will not be tolerated. For a more precise definition of academic misconduct and its consequences, refer to the Student Rights and Responsibilities policy available at https://www.nwpolytech.ca/about/administration/policies/index.html.

**Note: all Academic and Administrative policies are available on the same page.

If you cheat in any way, penalties will be pursued, potentially including a zero for the paper, an "F" for the course, and suspension from the institution.

ADDITIONAL INFORMATION:

My preferred teaching style is interactive lecture, derived from the teaching philosophy that little is learned until responses are made (either verbally or written). However, the majority of work in this course will be hands-on, lab-based experiential learning.

I encourage and welcome student consultation to the point of tutoring and I will be more than happy to proof students' rough drafts and to further discuss course material. Pre-writes of labs are welcome up to the due date and may be submitted by pinning them to my office door. Neatness counts; if I can't read it, I can't grade it.

Late labs will be graded but penalized 2 points per day. As adequate time will be allotted between the assignment and the due date, few excuses other than medical and major emergencies and single parenthood will be accepted. Papers with multiple spelling and grammatical errors will be returned ungraded; rewrites are permitted. Missing three or more lectures or coming in late without being excused will result in you being barred from writing the final exam.