

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

COURSE OUTLINE – FALL 2026

PY2110 (A2): Statistical Methods for Psychological Research – 3 (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. Ali M. AL-Asadi	PHONE:	780-539-2061
OFFICE:	C-311B	E-MAIL:	aalasadi@nwpolytech.ca
OFFICE HOURS:	By appointments		

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 and Mathematics 30 or permission of the instructor

REQUIRED TEXT/RESOURCE MATERIALS:

- This is an open-source book, which will be posted on the course's myclass. Cote, L. R., Gordon, R., Randell, C. E., Schmitt, J., & Guerra, R. (2024). Introduction to Statistics in the Psychological Sciences. University of Missouri, St. Louis, USA. **This is an open-source book, which will be posted on the course's myclass.**
- Collection of reading materials, articles, and other resources based on Open-Source texts will be posted to this course's D2L site at:
<https://myclass.nwpolytech.ca/d2l/home>

- Other resources: <https://www.crumplab.com/statistics/>, <https://open.umn.edu/opentextbooks/textbooks/196>, <https://www.jamovi.org/>, <https://jasp-stats.org/>, <https://www.gnu.org/software/pspp/>, <https://www.r-project.org/>,

DELIVERY MODE: On-Campus lectures and labs.

LEARNING OUTCOMES: As a result of taking this course, students will be able to:

- Classify data as categorical or quantitative and distinguish observational studies from experiments (including why correlation $\neq$ causation).
- Summarize distributions using appropriate graphs (histograms, boxplots, scatterplots) and numerical measures (mean, median, SD, IQR) based on shape and skew.
- Compute probabilities using addition, multiplication, and conditional rules, and identify independent/mutually exclusive events.
- Apply probability models including normal and binomial distributions to calculate probability and find percentiles.
- Understand sampling variability via the Central Limit Theorem and compute standard errors for sample means and proportions.
- Construct and interpret confidence intervals for population parameters (means/proportions) using z or t distributions.
- Conduct hypothesis tests: state hypotheses, check conditions, calculate test statistics and p-values, and draw contextually meaningful conclusions (including understanding Type I/II errors).
- Analyze relationships between two variables using correlation (r), regression lines (slope/intercept predictions), and r^2 , while recognizing extrapolation risks.
- Use SPSS and several open-source statistical programs (R, Jamovi, JASP, PSPP).

TRANSFERABILITY:

Please consult the Alberta Transfer Guide for more information. You may check to ensure the transferability of this course at Alberta Transfer Guide at

<https://transferalberta.alberta.ca/transfer-alberta-search/#/searchTypeStep>

**** For courses with alpha (letter) grading, a 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.**

EVALUATIONS:

4 Tests (15% each)	60%
2 Lab experiments (10% each)	20%
Attendance, participation, diligence, & work quality	20%

GRADING CRITERIA:

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

Alpha Grade	4-point Equivalent	Percentage Guidelines		Alpha Grade	4-point Equivalent	Percentage Guidelines
A+	4.0	95-100		C+	2.3	66-69
A	4.0	90-94		C	2.0	63-65
A-	3.7	85-89		C-	1.7	60-62
B+	3.3	80-84		D+	1.3	55-59
B	3.0	75-79		D	1.0	50-54
B-	2.7	70-74		F	0.0	00-49

*Note: This grading criterion is specific to this course and differs from the general criteria.

COURSE SCHEDULE/TENTATIVE TIMELINE:

*Please note that the dates and the sequence of chapters are tentative and may change.

Dates	Topics	Evaluation
Week 1	Elements within the scientific method, particularly variables, measurement, and scales.	
Week 2	Graphic representations such as frequency distributions, tables, and charts to summarize and describe collected data.	
Week 3 & 4	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	
Week 5	Standardized or z-score distributions and percentages under the normal curve.	Test 1
Week 6 & 7	Probability theory, sampling theory, and sampling distributions of scores and of means, standard error.	
Week 8 & 9	Hypothesis testing principles, null and alternative distributions, significance of outcomes, Type I and II errors, power.	Test 2
Week 10 & 11	T-tests (Student's t, independent, and repeated measures) ANOVAs (independent and repeated), factorial designs, and interactions.	
Week 12 & 13	Correlations, coefficients, scatter plots, regression lines, standard errors of estimate, and the relations between these concepts.	Test 3
Week 14 & 15	Non-parametric statistics.	
	No Classes. Final Exam Period	Test 4 Final Exam

STUDENT RESPONSIBILITIES:

Each class's assigned readings and exercises should be completed before attending that class. As this course depends heavily on discussion and, at times, practice exercises and illustrations, attendance at all sessions is required and is critical to the student's success in the course. In the event of illness or an emergency, please notify the instructor as soon as possible. If you have difficulty in this course, please contact me immediately for assistance. Please let me know if you want to discuss any aspect of the course or your aspirations.

You are accountable for delivered lectures, assigned readings, and any announcements that will be made in class occasionally. If you are unable to attend a particular class, it is your responsibility to find out what was missed. For optimal learning and readiness for class participation, you are expected to attend class regularly (with a minimum attendance rate of 80%) and read the assigned chapters/topics before class on the dates indicated in the

timetable. Past course records show that class attendance is highly correlated with the final grade in the course.

If you anticipate being unable to take a test or exam at the scheduled time due to illness or an emergency, please notify me immediately, preferably at least one day in advance. Please talk to me in person or via e-mail (aalasadi@nwpolytech.ca) to arrange an alternative date to write the test, if feasible. Failure to notify the instructor will result in a grade of zero for the missed tests unless proof is presented that you were physically or mentally unable to do so due to a sudden illness, emergency, or unavoidable circumstances beyond the student's control.

All students are expected to display a professional attitude and behaviour in the classroom. This includes reliability, respect for and cooperation with fellow students and the instructor, attention to fellow students' questions and the instructor's response, determination to achieve first-class work while meeting deadlines, and constructive response to criticism.

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/polytechnic-leadership/policies-directory>.

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

Additional Information

MOST IMPORTANT: Instructors reserve the right to use electronic plagiarism detection services on written assignments. **Instructors also reserve the right to ban the use of any form of electronics (cell phones, Blackberries, iPods, tablets, scanning pens, electronic dictionaries, etc.) during class and exams.**

Cell phones, tablets, notebooks, laptops, and other electronic devices are strictly forbidden in my classes and exams. Also, I use plagiarism and AI detection software for all written assignments and essays.

In Addition:

1. The format of each exam will be discussed in class.
2. Exam grades are final, and there is no substitute work for your poor exam grade.
3. The nature and topics of your written paper will be discussed in class
4. It is your responsibility to read every chapter and assign reading (if any) and attend all lectures.
5. Lectures will not always cover the reading materials. Lectures may cover topics and include information that is not covered by your reading materials. Therefore, it is imperative that you attend every class, as your exams may include materials from lectures that are not covered in the reading materials.

6. Students are expected to display a professional attitude and behaviour. These attitudes and behaviours are many and will be discussed in class. Any violation or misconduct may result in dismissal from the class.

7. Talk to me if you have concerns or if you are experiencing difficulties that may have a negative impact on your academic performance.

Please keep this course information sheet for future reference.