PSYC.4100 COURSE OUTLINE 2021-2022

Instructor: Jim Clark, 4C78A, 204-786-9757, j.clark@uwinnipeg.ca (email preferred)
Office hour: Fri 10:30-11:20am by Zoom or by appointment at other times
Lab Instructor: Cory Bellhouse, corybellhouse@hotmail.com

Classes: PDFs and videos for lectures will be available on the course website and Nexus. Zoom meetings will be held on Mon and Wed at 9:30 with Jim to lecture, discuss material, and work additional examples. These classes will go until 11:30 initially and then be evaluated to see if changes are needed. Cory will post a lab video later in the week. Jim will have open class on Fridays at 9:30 for questions and an office hour at 10:30 (Jim on the Schedule).

Website: www.uwinnipeg.ca/~clark/teach/4100/
Listserv: Students will be added to a listserv psy4100@uwinnipeg.ca that distributes messages about the course. Emails sent by people on the list go to everyone. Be careful sending and responding to messages!

Text: Clark, J. M. (unpublished). *Intermediate statistics: Multiple regression and analysis of variance with SPSS*. (text available on-line)

PSYC-4100(6) INTERMEDIATE RESEARCH DESIGN AND DATA ANALYSIS (Le3, La3) This lab course extends the basic research and data analysis methods introduced in 2101 and 2102. Topics in this course include intermediate research methods (e.g., computer-aided research design and literature search, construct validity), intermediate data analysis methods (e.g., analysis of variance and partial/multiple correlation techniques for selected experimental and non-experimental designs), and current issues in social science methodology. The lab component provides opportunities to design, execute, analyze, and report the results of behavioural research, and emphasizes the use of computers in research design and data analysis (e.g., the use of such statistical packages as BMDP, SAS, and SPSS). This course is required of all students in the Psychology Honours program.

Evaluation:
The course consists of six units on statistics, three each term. Between units, there will be one week to work on assignments, to cover related research methods, and to work on the term project. The attached schedule shows tentative dates for various class activities and evaluations.

Grades will be based on six assignments (three per term, worth 6.5% each), two term tests (one per term, worth 25% each), and a report (worth 11%). Assignments involve analyses of simulated data, along with interpretation and explanation of the results. Although demanding and of modest value individually, assignments do account for 39% of your final mark and play a major role in learning, understanding, and practicing the course material, which is essential to do well on tests. The Fall Schedule shows dates for assignments and reports for the Fall Term. One mark will be subtracted for each day late (*forgiven if not excessive or repeated*). An assignment with a mark of 72% handed in two weeks late earns a final mark of 72-14 = 58. Tests are similar to assignments, but cover the entire term, have short time frames to be determined (e.g., 4 hours?), and are to be completed individually without reference to external material (e.g., notes, contact with other students, ...). Tests cover all material from assigned readings, handouts, and lectures, and will have copies of formulas, SPSS, and a calculator. Requests to change due dates will be considered given appropriate documentation (e.g., medical note, special family circumstances, ...). You have up to two opportunities to complete a report, once each term. Those completing the fall report have the option to do a second report in the spring. Students completing only the spring report will ***not*** have a second opportunity.

Assignments and tests will be submitted through Crowdmark via Nexus. More information about Crowdmark will be forthcoming. You must ***submit a single PDF document for EACH question***. If there are five questions, for example, you will submit five PDF documents, each containing SPSS output, calculations, and explanations. You will need some way to combine different sorts of documents into a single PDF file to submit to Crowdmark. After the time allowed to complete tests, there will be extra time to organize files for uploading to Crowdmark.

Grade Cutoffs & Sample Calculations:

A+	90-100	B+	75-79	C+	65-69	D	50-59
A	85- 89	B	70-74	C	60-64	F	0-49
A-	80- 84						

	Assignments	Report	Tests		Mark	Grade
Weight	.39	.11	.25	.25	1.00	
Student A	70%	72%	67%	71%	69.72	B
Student B	83%	84%	76%	85%	81.86	A-

The final mark of 69.72 for student A equals .39*70 + .11*72 + .25*67 + .25*71. Without adjustments, the final grades are in the last column. Note the final grades that I submit are tentative until approved by Senate and can be adjusted in either direction by the Department or Senate. ***The final date for withdrawal without academic penalty is 16 February 2022.***

PSYC.4100 TENTATIVE FALL TERM SCHEDULE 2021-2022

Dates		Topic / Handouts		
Sep	8W	Introduction: Class Organization, Texts; Project Overview, Literature review		
	10F	Lab: Introduction to SPSS, Summation notation		
		UNIT 1: CLARK CHAPTERS 1 TO 6		
Sep	13-17	11 - Descriptive Statistics & Single Sample Hypothesis Testing		
		M - Review Lab & Lecture	W - Example	F - Jim
	20-24	12 - Difference between two means		
		M - Review Lab & Lecture	W - Example	F - Jim
	27-1Oct	12 - Correlation / Regression & Difference between dependent means		
		M - Review Lab & Lecture	W - Example	F - Jim
	30Th	*University Closed for Truth & Reconciliation Day*		
Oct	3Su	***Due: Science & Religion Questionnaire***		
	4M	Practical data analysis		
	5Tu	***Due: Literature Reviews***		
	6W	Discuss Literature Reviews and Fall Project		
	8F	Work on Assignment 1		
	11-15	*Fall Reading Week (UW closed on 11 Oct for Louis Riel Day)*		
		UNIT 2: CLARK CHAPTERS 7 TO 10		
Oct	18-22	21 - Multiple Regression Equation & Overall Statistics		
		M - Lecture	W - Example	F - Jim
	18M	***Due: Assignment 1***		
	25-29	22 - Significance of Regression coefficients		
		M - Review Lab & Lecture	W - Example	F - Jim
Nov	1-5	23 - Strength of Predictors		
		M - Review Lab & Lecture	W - Example	F - Jim
	8M	Ethics principles and procedures; Discuss Report		
	10W	Scientific Writing, APA style, and Data Presentation		
	11Th	*University Closed for Remembrance Day*		
	12F	Work on Assignment 2		
		UNIT 3: CLARK CHAPTERS 11 TO 15		
	15-19	31b - Multiple Predictors and Automated selection procedures		
		M - Review Lab & Video Lectures	W - Example	F - Jim
	15M	***Due: Assignment 2***		
	22-26	32 - Nonlinear Relationships		
		M - Review Lab & Video Lectures	W - Example	F - Jim
Nov	29-3Dec	33 - Categorical Predictors & Interaction		
		M - Review Lab & Video Lectures	W - Example	F - Jim
Dec	6M	Review Lab & Review Term		
	17F	***Due: Assignment 3 (keep copies or rerun SOME analyses for Report 1)***		
	10-23	***Test #1 - To be determined***		
2022				
Jan	6Th	Winter Classes begin - Schedule will follow similar format for Analysis of Variance ***Due: Report 1*** - Students who submit Report 1 will have the option in term 2 to write Report 2. Students who do NOT submit Report 1 will ONLY have one opportunity to submit a Report.		
Feb	***16W***	***Final date to withdraw from 2021-2022 full-year F/W courses***		

UNIVERSITY REGULATIONS & ADDITIONAL INFORMATION

For more information about programs in Psychology, tutoring, visiting speakers, registration information, research opportunities, and employment, visit the Psychology website at http://psychology.uwinnipeg.ca, our Facebook Page (Psychology Department@UWinnipeg), and our Instagram page (psychologyatuwinnipeg)

Voluntary Withdrawal dates (no refund) for the academic year can be found on the Academic Dataes, Regulations, and Policies page of the Academic Calendar: http://www.uwinnipeg.ca/registration/course-drop-information.html

Students should be familiar with the Regulations and Policies section of the Course Calendar dealing with academic regulations and policies, including Senate appeals and academic misconduct (e.g. plagiarism, cheating). See: http://www.uwinnipeg.ca/academics/calendar/docs/regulationsandpolicies.pdf

All students, faculty, and staff have the right to participate, learn, and work in an environment that is free of harassment and discrimination. The UW Respectful Working and Learning Environment Policy may be found online at: www.uwinnipeg.ca/respect

Students may choose not to attend classes or write examinations on holy days of their religion, but they must notify their instructors at least two weeks in advance. Instructors will then provide an opportunity for students to make-up work and/or examinations without penalty. A list of religious holidays can be found in the 2020-2021 Academic Calendar, in the section, Important Notes (https://www.uwinnipeg.ca/academics/calendar/dates.html).

Students with documented disabilities, temporary or chronic medical conditions, requiring academic accommodations for tests/exams or during lectures/laboratories are encouraged to contact Accessibility Services (AS) at 204.786.9771 or https://www.uwinnipeg.ca/accessibility-services/ to discuss appropriate options. All information about a student's disability or medical condition remains confidential.

FALL TERM RESEARCH PROJECT
PREDICTORS OF ATTITUDES TOWARD SCIENCE

Each term the 4100 class performs or simulates a group research study. As a class we review the literature, decide on the research design, develop measures, complete ethics forms, collect data, enter data, and analyze the overall results. All these steps will be discussed, but simulation may be necessary given time constraints. Students write individual reports based on a sample of data selected randomly from all the observations. The actual analyses are also used for Assignment 3.

The first term involves a nonexperimental project in which we examine correlates of attitudes toward science (the dependent or criterion variable), including such aspects as whether or not science is a generally valid way of learning about the world (including people).

I chose this topic for several reasons. First, there are many people (including academics and psychologists) who have been critical about science as a valid way of knowing and argue that science is just one of many equally-valid (or equally invalid) methods, that science is Eurocentric and a tool for domination of women and minorities (or other cultures in general), and that in general science does not deserve any "privileged" epistemological status. Second, psychology itself is divided with respect to the proper relationship between its scientific and applied components. Clinical psychology is based less on science than many non-clinicians (and some clinicians) think is appropriate, and scientific psychology is irrelevant in the minds of many clinicians (and some scientists). Attitudes toward science is therefore an important issue for psychology students.

We will use a measure of people's current attitudes toward science (i.e., how positively or negatively they view science), as well as measures of predictors that we think might account for differences among people in their beliefs about science. One predictor that we will examine more closely in the fall is religiousness. Although a controversial topic, many previous studies report a negative correlation between religiousness and beliefs about science. Moreover, scientists are more likely to be non-believers than is observed in the general population. The project will involve the phases enumerated below.

1. Review Literature

Each student will use various library resources, especially PsycInfo, to find an empirical (i.e., research) article related to the criterion variable or some predictor of interest that we have identified. Special attention should be paid to studies that identify the mechanisms underlying the observed or hypothesized relationships (i.e., studies that help us understand why the specified relationship occurs). Students will write ***brief summaries*** of their article, including: a full reference for the study in correct APA format, rationale, method, results, conclusions, and evaluation of the study. See the schedule for the due date of the summaries and the day on which they will be discussed in class. ***Be prepared to review briefly your summary in that class.***

2. Design Study and Develop Measures

The class will select a manageable design that will further our understanding of the criterion variable and its correlates. This might involve replication of previous research or a novel question. As well as measures of the criterion variable, the class will consider measures for the other constructs involved in our hypotheses. The schedule contains expected dates to develop measures, finalize the method, and complete ethics and subject pool procedures.

3. Collect Data

Time permitting (rare), ethical approval will be obtained from the appropriate Ethics committee(s), materials prepared, and tests administered to subjects from the Introductory Psychology subject pool. The raw data will be checked and entered. These tasks will be distributed among students. If time does not permit collection of data, I will simulate our study.

4. Analyze Results

Students will be given individual samples of observations from the class data (or the simulation) and will analyze their own data using the statistical techniques learned this term. Preliminary analyses will include descriptive statistics and graphical representations. Relationships will be examined by plots, correlations, and regression methods. We will evaluate the support for the various hypotheses, and propose additional research. Assignment 3 will specify some of the analyses.

5. Prepare Individual Reports

Students will write brief reports (about 8 pages of text) based on their own findings in correct American Psychological Association (APA) publication style. A later class and chapter will discuss APA style. The report will include: Title Page, Abstract, Introduction, Method, Results (including at least one table and one figure), Discussion, and References. The report will be worth 11% of the final mark in the course.

A NOTE ON HOW TO SUCCEED AT 4100

Experience teaching this course over many years suggests that there are some tried and true methods for succeeding at 4100. Here are a few suggestions (some need adapting to on-line format). ... Jim

1. **Work hard from the start** of the course. Quantitative courses are cumulative, often in ways that may not be true in other classes where you can understand later material without first grasping earlier material. In quantitative courses, even ones like 4100 that involve little math (see 10), later material can be nonsense without understanding earlier work.

2. **Participate fully in classes**, both lectures and labs. Attend class and sit where you can see and hear what is going on. Don't position yourself somewhere or engage in activities that will only lead you to become distracted from class. If you do not understand something or it is not clear, then ask questions. Invariably other students have the same questions and they will appreciate your initiative. Engage with the activities (e.g., SPSS commands) even if they appear overly simple to you. The more automatic everything becomes, the easier later material will be and the better you will do.

3. **Focus on understanding formulas**. Much course knowledge can be summarized in a few pages, but this is only true if the formulas are meaningful, rather than random scribbling. Part of the secret again is to appreciate the cumulative nature of formulas. You learn basic calculations for values that then appear in more complex formulas. A good analogy is reading; good readers understand letters (the symbols) and words (groups of symbols), which enables them to understand more complex units (sentences, paragraphs, ...). The more automatic each level of the process, the greater the cognitive resources available to understand and think about the meaning of larger units. And formulae do have meanings!

4. **Work in groups**. There are several benefits to working outside of class in groups. One benefit is that it increases the odds that someone understands the material, can answer a question, or can steer things in a constructive direction. This reduces situations in which students cannot proceed because they don't know how to get started. And trying to explain material to other students also benefits the "teachers," who must think about and articulate more fully their own understanding. Another benefit is motivational. A group can keep everyone motivated to engage in the work necessary to succeed in courses like 4100. Some caution is necessary, of course, because groups can become distractions. Finally, you will get to know some students well, forming friendships that often last for a long time.

5. **Statistics is best learned by DOING, not just by reading or listening**. One major way to learn statistics is the Assignments. The time you put into applying the material covered in the text, lectures, and labs is time well spent because you are using the concepts to analyze realistic data. Labs provide another opportunity to do statistics, not only in the lab itself but also after. Labs are offered on Fridays and we take up the labs on Monday, the first hour of lecture. There is often not enough time on Friday to complete all the lab in detail or to draw correspondences between the tutorial and computer sections. It is worth while to complete the labs before they are taken up on Monday. You will learn far more actively doing the labs yourself than simply receiving the answers in class. You will also have a chance to prepare questions about the lab that can then be answered in class on Monday.

6. **Read the text**. Material presented in class and labs is elaborated more fully in the text. Spend time working your way through the text, ideally before the relevant lecture and lab. Another advantage of reading the text is that the examples used there are different than the examples used in lectures and labs. One strategy that is often recommended for reading texts is to skim over the unit of material you are studying first, and then read it more closely on a second reading. The pre-reading gives you an opportunity to form an overall conceptual scheme for the material.

7. **Avoid procrastination!** One of the major challenges for many people is to get themselves going on demanding tasks, such as 4100 Assignments or the Report. But the longer such tasks are put off, the more daunting they can become given the demands remain the same while the time has diminished. A strategy that has been found to work for procrastination problems is to break larger tasks into more manageable pieces and pick away at those in a timely fashion. The starting point for Assignments, for example, might be to write the SPSS commands that generate the simulated data. This necessary and tangible step can be completed in little time, and makes a good first stage. You will also see concretely the data that you will be working with. Each question might then make a subsequent series of steps that can be scheduled in such as way as to finish the Assignment in the allotted time. Writing a paper or other complex tasks can be similarly broken down into stages.

8. **Calculators and Computers are your friends!** But like friends, you have to know them well to gain the most out of them. Spend time learning the functions on your calculator; if like most of us you have long ago "misplaced" the manual for your calculator, use Google to track one down. Practice operations repeatedly so that they become automatic before you have to use them in situations where you have limited time (e.g., tests?). Similarly, it is helpful to become proficient at getting the computer to do what you want, whether it is to enter data, to generate a table or graph, or to perform some analysis.

9. Understand that certain aspects of the course are meant to link being an undergraduate student with being a good graduate student or employee. Whether you proceed to graduate school or to work or to life more generally, you will find that there is

not always someone there to explain how things work or to guide you through a process. **You will often need to learn how to do things on your own.** That is why one of the top qualities employers look for in employees is the ability to learn independently. You may be frustrated at times by us answering a question with a question or providing indirect answers (e.g., ideally, how to answer the question for yourself), but there is a rationale for it. Push that frustration aside or use it (e.g., "I'll show him") to figure out how to answer your own questions.

10. On a related theme, **avoid various sorts of negative self talk.** Sometimes students think that they "can't do math" or that "learning this junk is irrelevant." There is little to gain by engaging in such negative ruminations, and much to lose. Such thoughts are distracting, and rather than energy and cognitive resources being devoted to learning, they are frittered away in unproductive activity. And such beliefs are often untrue; for example, statistics as taught in 4100 is more a way of thinking than math, and past difficulties with math courses may have been due to instruction or work habits. Keep a positive attitude and you will find work easier than it might otherwise be; note I said "easier" not "easy!"

ADVICE ON ASSIGNMENTS

Definitely one challenging aspect of 4100 are the assignments, which can take much time and effort to complete but are each worth "only" 6.5% of your final mark. Here are some suggestions that might help to make the assignments more manageable.

1. Keep in mind that six times 6.5% is 39%, a substantial portion of your final grade. So it is important to submit something for each assignment, ideally in a timely fashion to not lose marks.

2. Working on assignments serves two purposes; one is to develop and evaluate your understanding of the current material so that you are prepared when we move on to topics that build on that material, and a second is to learn the material (i.e., study) in preparation for the end-of-term tests (and for any future use of statistics, such as your thesis). So the time you commit to assignments has both short-term and long-term benefits.

3. With respect to preparing for tests, remember that you will have limited time for the tests. It is therefore important to learn what is important and gain some experience at communicating that important material in a succinct manner. Avoid a "shotgun approach" to assignments that includes excessive amounts of material in the hopes that important points are buried somewhere. Copying substantial sections from lecture notes or the text does not help you to capture the important ideas in your own brief words, which is required to do well on the tests.

4. To encourage conciseness, markers consider how well students have achieved a succinct and clear explanation of the important concepts.

PSYC.4100 **PRELIMINARY WINTER TERM SCHEDULE** **2021-2022**

Week of

UNIT 4

Jan 7F Initial class

Jan 10-14 Introduction to Independent (Between-Subjects) ANOVA; ch 1, 2, 3
W Lecture F Practice

Jan x xx - Report 1 due

Jan 17-21 Multiple Comparisons: Post Hoc; ch 4
M Lecture W Practice F Lab

Jan 24-28 Multiple Comparisons: A Priori; ANOVA with Multiple Regression; ch 5, 6
M Review Lab, Lecture W Practice F Lab

Jan 31-4Feb Experimental Design, Randomization, Counterbalancing, ...; Discuss Winter Project
M Review Lab, Lecture W Practice F Work on Assignment 4

UNIT 5

Feb 7-11 Between-Subjects Factorial ANOVA; ch 7, 8
M Lecture W Practice F Lab

Feb 14-18 Post Hoc and Planned Comparisons for Main Effects; ch 9, 10
M Review Lab, Lecture W Practice F Lab

Feb xx - Assignment 4 Due

Feb 16 ***Final date to withdraw from FW courses without academic penalty***

Feb 21-25 Reading Week (UW closed 21 Feb for Louis Riel Day)

Feb 28-4Mar Simple Effects, Partitioning the Interaction, Regression for Factorial designs; ch 10, 11
M Review Lab, Lecture W Practice F Lab

Feb xx - One-page review of attitude change article due

UNIT 6

Mar 7-11 Ethics, Reporting ANOVA results, Discuss Project
M Review Lab, Lecture W Practice F Work on Assignment 5

Mar 14-18 Within-Subject ANOVA and Comparisons; ch 12, 13
M Lecture W Practice F Lab

Mar xx - Assignment 5 Due

Mar 21-25 WS Factorial designs and follow-up analyses; ch 14, 15
M Review Lab, Lecture W Practice F Lab

Mar 28-1Apr Mixed Factorial ANOVA and Higher Order Factorial Designs; ch 16, 17?
M Review Lab, Lecture W Practice

Apr 4-6MW Review, Practice Test, Parts 1 & 2 (*Apr07W follows Friday schedule*)

Apr xx - Assignment 6 Due

Apr 8-22 Exam period

Apr xx Report 2 due

Apr 15 ***UW closed for Good Friday***