

University of Waterloo
Department of Psychology
PSYCH 492
Psychological Measurement: Foundations of Research and Practice
Fall 2019-20
Mondays & Wednesdays, 10:30am-12:20pm

Instructor and T.A. Information

Instructor:	Professor Bobocel
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Course Description

Measurement is fundamental to science. Tests of theory involve specific predictions requiring controlled and accurate observations. In psychology, we are faced with the problem of measuring variables such as “intelligence” or “aggressiveness” that are inferred from behaviour or self-report. How do we know if the tests we create are really measuring what they claim? How can we estimate the precision of our tests? This course will tell you. You will learn not only how to evaluate psychological tests and measures, but also how to construct and refine your own. This knowledge is essential in both research and applied settings, because research results and clinical or applied decisions are dependent on the tests and measures that people use.

Course Goals and Learning Outcomes

Upon completion of this course, students should be able to:

- A. Define a construct and create a scale/measure to assess it
- B. Evaluate the reliability of a scale/measure
- C. Evaluate the validity of a scale/measure
- D. Use Qualtrics software to collect data
- E. Use SPSS to analyze the reliability and validity of a scale/measure
- F. Introduction to new analytic procedures: Regression and Factor Analysis
- G. Write up research reports in APA format

Recommended Text

- Custom Published Version of Kaplan, R.M., & Saccuzo, D.P. (2013). Psychological Testing: Principles, Applications & Issues (9th edition). Scarborough, ON: Thomson-Nelson.

Note: This is a special (reduced) printing of the book that contains only the chapters we will use, and it is considerably cheaper than the complete book. This version is available in the bookstore, under the course title and my name (not the authors’ names). Note that I’ve used the same custom text for several years so there are likely to be used copies around, although they will be earlier editions.

Course Requirements and Assessment

Your grade in this course will be based on the following:

Assessment	Date of Evaluation (if known)	Weighting
Class assignments 1-6	Varies, see timetable on LEARN	9%
Exam 1	Wed, Oct 23	25%
Exam 2	December TBA	25%
Lab assignment A	Fri, Oct 11	16%
Lab assignment B	Wed, Dec 4	25%
Data collection	Fri, Nov 1	-
REG bonus	-	+2%
Total		100%

Class assignments 1-6 (9% of final grade)

Six assignments will be due at specified times throughout the term (you will submit them at the start of the specified lecture - see timetable), and we will review the solutions in class as specified. The assignments provide you with problems corresponding to the lecture material, which will help you to become more proficient and learn the material at a deeper level (application and generalizability). Importantly, the assignments will help you to prepare for exams (see item 2). Your performance on the set of assignments is worth 9% of your final grade (i.e., each assignment = 1.5 points). Your grade will be based on completing and SUBMITTING SOLUTIONS IN CLASS ON THE DAY THEY ARE DUE.

- 1.5 marks for a completed assignment with more than half of the questions answered correctly
- .75 mark for a completed assignment but more than half of the questions answered incorrectly
- 0 for submitting very incomplete assignment, or failing to submit.

Due to class size the TAs will not mark each answer individually, thus it is to your benefit to attend the review classes.

NOTE: Class assignments must be turned in BY THE DUE DATE – SO ATTEND TO THE SCHEDULE.

Two exams (one during the term, the other during the final exam period; 50% of final grade)

Each test will include questions on lectures and readings related primarily to those topics covered since the previous exam. The exams will emphasize your application and generalizability of the material covered in class and text—thus, rather than memorizing, you will need to know the material well enough to apply it to new situations, which reflects a higher level of learning. Together, the exams are worth 50% of your course grade (each is worth 25%).

Lab Assignments A & B (16% and 25% of final grade, respectively)

You will be required to complete 2 Lab Assignments, due during the term. For Lab Assignment A (due on Fri, Oct 11), your group will submit the scale that you created with a brief summary of the construct definition and domain specification. For Lab Assignment B (due Wed, Dec 4), you will conduct a psychometric analysis of the data obtained from your scale, including item analysis, factor analysis, convergent and discriminant validity. Both lab assignments may be submitted as a group, or as individuals if preferred (to be discussed with your TA). Together, the lab assignments are worth 41% of your final course grade. Assignment A = 16%; Assignment B = 25%). The penalty for late submissions on either assignment is 6% (of the assignment grade) per day.

Note: We will say more about this as the term progresses, but so you are forewarned it is important to know that your measure cannot “raise any eyebrows” (i.e., it cannot contain content that is potentially

upsetting or highly personal, no content about sexuality), and it should contain a maximum of 10-12 items. For ethical reasons, your TA is required to veto any controversial content.

Data Collection

You are required to complete the booklet of measures created by the class in order to access the data (and hence complete Lab Assignment B). The booklet must be completed during lab time as indicated in the timetable below (Friday, Nov 1). No exceptions can be made, because we are on a tight schedule to input the data etc. We may use Qualtrics to create an on-line version of the scales, but regardless of format, you will complete the measures in lab.

REG Bonus

Experiential learning is highly valued in this course, and the Department of Psychology more generally. Therefore, students can earn a bonus of 2% by participating in experiments. Guidelines for participation, including alternative assignments, will be posted on the LEARN website, along with the course syllabus (see REG Bonus Marks link).

Course Outline

This course is a hybrid between a statistics course and a research methods course. The lecture sessions will be run similar to those of a statistics course, and the labs will run like a research workshop. In the lectures, we will go over the content of the assigned readings step-by-step, in order to learn the basic material. You are expected to complete the assigned readings in preparation for the class. In addition, I will assign problem sets/assignments corresponding to the lecture material, which we will review in class (often the following week; see timetable). In summary, the lectures and the text provide the necessary foundation required for the successful application of the material in the assignments, the exams, and the lab components.

Drawing on the lecture material, your TA will assist you (in small groups) in an independent project in the lab, which will require individual research and some written work from each of you. This will be a measure construction project, intended to help you learn how to devise and refine a psychological test. The project will involve carefully researching and defining a construct of interest, inventing a test to measure this construct, and collecting a data set on your test on which to do a psychometric analysis and an analysis of convergent and discriminant validity. You will work in groups of 2-3 for this project depending on class size (more detail below).

Tentative Schedule of Topics is Below (also see "Lecture & Lab At a Glance" for a calendar view of the below).

Week	Date	Topic	Readings Due
1	Mon, Sept 2	Enjoy last day of summer!	
	Wed, Sept 4	Course Introduction – lots to review	
2	Mon, Sept 9	The Big Picture	Chapter 1
	Wed, Sept 11	Process of Test Construction	Chapter 6, pp. 157-170; skim Chapter 7
3	Mon, Sept 16	Test Construction continued	
	Wed, Sept 18	Norms & Basic Statistics; Intro to SPSS	Chapter 2 Assignment 1 posted

Week	Date	Topic	Readings Due
4	Mon, Sept 23	Correlation & Regression	Chapter 3, omit pp. 91-94 for now;
	Wed, Sept 25	Regression continued & review; Assignment 1 solutions reviewed	ASSIGNMENT 1 DUE in class
5	Mon, Sept 30	Reliability and Measurement Error	Chapter 4, omit pp. 118 for now; Assignment 3 posted; Reliability Applications non-graded assignment posted
	Wed, Oct 2	Applications of Classical Test Theory; Assignment 2 solutions reviewed	ASSIGNMENT 2 DUE in class
6	Mon, Oct 7	Applications of Classical Test Theory Continued & Psychometrics of Observation	Chapter 4, pp. 118-110
	Wed, Oct 9	Assignment 3 & Non-graded Reliability Applications solutions reviewed	ASSIGNMENT 3 DUE in class; Lab Assignment A DUE no later than 4pm Friday, Oct 11 to your TA
7	Mon, Oct 14	Rejuvenate and Study!	
	Wed, Oct 16	Rejuvenate and Study!	
8	Mon, Oct 21	<i>No Lecture: Professor available in PAS 2086 for review as needed (10:30-12 noon)</i>	
	Wed, Oct 23	Exam 1 (Room TBA)	
9	Mon, Oct 28	Validity	Chapter 5; Assignment 4 posted
	Wed, Oct 30	Validity continued; In-class review of Midterm 1 solutions (date may vary)	
10	Mon, Nov 4	Applications of Validity; Assignment 5 posted	Chapter 18; Chapter 19
	Wed, Nov 6	Applications of Validity continued; Project data set up; Assignment 4 solutions reviewed	Re-read text pp. 499-505; ASSIGNMENT 4 DUE in class
11	Mon, Nov 11	Item Analysis	Chapter 6, pp. 170-184; Assignment 6 posted
	Wed, Nov 13	Item Analysis & Reliability in SPSS	
12	Mon, Nov 18	Factor Analysis	Chapter 3, pp. 91-94
	Wed, Nov 20	Factor Analysis in SPSS; Assignment 5 solutions reviewed	ASSIGNMENT 5 DUE in class
13	Mon, Nov 25	Evaluating Convergent & Discriminant Validity; Course evaluation	ASSIGNMENT 6 DUE in class
	Wed, Nov 27	Assignment 6 solutions reviewed; Q&A on Lecture Material to Date; Bonus module: Testing interactions in regression (not on the exam)	
14	Mon, Dec 2	<i>No Lecture: Work on Lab Assignment B</i>	

Week	Date	Topic	Readings Due
	Wed, Dec 4	Classes over	Lab Assignment B DUE no later than 4pm Wed, Dec 4 to your TA

Electronic Device Policy

Laptops are allowed for note taking during lecture as needed.

Attendance Policy

You are responsible for attending classes and labs.

Intellectual Property

Students should be aware that this course contains the intellectual property of their instructor, TA, and/or the University of Waterloo. Intellectual property includes items such as:

- Lecture content, spoken and written (and any audio/video recording thereof);
- Lecture handouts, presentations, and other materials prepared for the course (e.g., PowerPoint slides);
- Questions or solution sets from various types of assessments (e.g., assignments, quizzes, tests, final exams); and
- Work protected by copyright (e.g., any work authored by the instructor or TA or used by the instructor or TA with permission of the copyright owner).

Course materials and the intellectual property contained therein, are used to enhance a student's educational experience. However, sharing this intellectual property (whether wholly or in part) without the intellectual property owner's permission is a violation of intellectual property rights. For this reason, it is necessary to ask the instructor, TA and/or the University of Waterloo for permission before uploading and sharing the intellectual property of others online (e.g., to an online repository). Students are also not permitted to use the material (whether wholly or in part) for other purposes professionally or personally without explicit approval of the instructor.

Permission from an instructor, TA or the University is also necessary before sharing and using the intellectual property of others from completed courses with students taking the same/similar courses in subsequent terms/years. In many cases, instructors might be happy to allow distribution of certain materials. However, doing so without expressed permission is considered a violation of intellectual property rights.

Please alert the instructor if you become aware of intellectual property belonging to others (past or present) circulating, either through the student body or online. The intellectual property rights owner deserves to know (and may have already given their consent).

Academic Integrity

In order to maintain a culture of academic integrity, members of the University of Waterloo are expected to promote honesty, trust, fairness, respect and responsibility. See the [Office of Academic Integrity webpage](#) for more information.

Discipline

A student is expected to know what constitutes academic integrity, to avoid committing academic offences, and to take responsibility for his/her actions. Check [the Office of Academic Integrity](#) for more information. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offenses and types of penalties, students should refer to [Policy 71 - Student Discipline](#). For typical penalties check [Guidelines for the Assessment of Penalties](#).

Concerns about a Course Policy or Decision

Informal Stage. We in the Psychology Department take great pride in the high quality of our program and our instructors. Though infrequent, we know that students occasionally find themselves in situations of conflict with their instructors over course policies or grade assessments. If such a conflict arises, the Associate Chair for Undergraduate Affairs (Richard Eibach) is available for consultation and to mediate a resolution between the student and instructor: Email: reibach@uwaterloo.ca; Ph 519-888-4567 ext. 38790

Grievance

A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70 - Student Petitions and Grievances, Section 4. When in doubt, please be certain to contact Richard Eibach, the Associate Chair for Undergraduate Affairs who will provide further assistance; reibach@uwaterloo.ca.

Appeals

A decision made or penalty imposed under Policy 70 - Student Petitions and Grievances (other than a petition) or Policy 71 - Student Discipline may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to [Policy 72 - Student Appeals](#).

Note for Students with Disabilities

The [AccessAbility Services](#) office, located on the first floor of the Needles Hall extension (NH 1401), collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the AS office at the beginning of each academic term.

Accommodation for course requirements for Psychology courses

Students requesting accommodation for course requirements (assignments, midterm tests, final exams, etc.) due to illness should do the following:

- consult the University’s [examination regulations](#) for information about procedures and policies for requesting accommodations
- seek medical treatment as soon as possible
- obtain documentation of the illness with a completed uWaterloo [Verification of Illness Form](#)
- submit that form to the instructor within 48 hours. Students in Centre for Extended Learning (CEL) courses must submit their confirmation of the illness to CEL.

- (if possible) inform the instructor by the due date for the course requirement that you will be unable to meet the deadline and that documentation will be forthcoming.
- In the case of a missed final exam, the instructor and student will negotiate an extension for the final exam, which will typically be written as soon as possible, but no later than the next offering of the course.
- In the case of a missed assignment deadline, midterm test, or quiz, the instructor will either: waive the course component and re-weight remaining term work as he/she deems fit according to circumstances and the goals of the course, or provide an extension.
- In the case of bereavement, the instructor will provide similar accommodations to those for illness. Appropriate documentation to support the request will be required.
- Students who are experiencing extenuating circumstances should also inform their academic advisors regarding their personal difficulties.
- Elective arrangements such as travel plans are not acceptable grounds for granting accommodations to course requirements per the uWaterloo Examination Regulations and Related Matters.

Mental Health Services

Mental Health Services aim is to provide holistic programming and services to help you lead a healthy and balanced life. We strive to provide a secure, supportive environment for students of all orientations and backgrounds.

Students suffering from problems with anxiety, depression, problems with sleep, attention, obsessions or compulsions, relationship difficulties, severe winter blues, etc., may make an appointment by phone or in person. Appointments are usually available within two days of initial contact with one of our medical doctors. All contacts are completely confidential.

Contact Health Services

Health Services Building

Call 519-888-4096 to schedule an appointment

Call 1-866-797-0000 for free 24/7 advice from a health professional

Contact Counselling Services

Needles Hall Addition, NH 2401

Call 519-888-4567 x 32655 to schedule an appointment

counserv@uwaterloo.ca

Territorial Acknowledgement

We acknowledge that we are living and working on the traditional territory of the Attawandaron (also known as Neutral), Anishinaabe and Haudenosaunee peoples. The University of Waterloo is situated on the Haldimand Tract, the land promised to the Six Nations that includes six miles on each side of the Grand River.