

Syllabus for Psychology 492 (Jan. 2, 2017)
Psychological Measurement: Foundations of Research and Practice
2016-17 Winter

Instructor:

Professor Bobocel
PAS 4031
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Office Hours: Weds 10:00-noon, PAS 4031

Teaching Assistants:

	Office	Email	Office Hours
Frank Mu	PAS 4247	xqmu@uwaterloo.ca	Wed 1:00-2:00 & Thurs 12:30-1:30
Dan Brady	PAS 4239	d2brady@uwaterloo.ca	Mon 4:00-4:50 & Fri 11:30-12:20

Class Time and Location

Mondays & Wednesdays 2:30-4:20 pm PAS 1229

Lab Times and Locations:

Lab 101: 2:00-2:50 pm Thursday PAS 1237

Lab 102: 10:30-11:20 pm Friday PAS 1237

Textbook (recommended):

Custom Published Version of Kaplan, R.M., & Saccuzzo, D.P. (2013). *Psychological Testing: Principles, Applications, & Issues* (8th 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 has a different ISBN than the complete book and 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 lower editions.

Course Objectives:

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 we think they are? 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 Structure:

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 teaching assistant (TA) will assist you 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, ideally 3 (or 2-4 depending on lab size) for this project (more detail below).

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

1. Completion of assignments 1-6. 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 12% of your final grade (i.e., each assignment = 2 points). Your grade will be based on completing and **submitting solutions in class on the day they are due**. **Grading will be 2 marks for a completed assignment with more than half of the questions answered correctly; 1 mark for a completed assignment but more than half of the questions answered incorrectly, and 0 for submitting an 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: The class-assignments must be turned in by the due date** – so watch the schedule closely.
2. Your performance on 2 midterm exams (one during the term, the other during the final exam period). 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, rather than mere memorization—thus, **rather than memorizing, you will need to know the material well enough to apply it to new situations thus reflecting a higher level of learning**. Together, the exams are worth 50% of your course grade (each is worth 25%)
3. Lab Assignments A & B: You will be required to complete 2 Lab Assignments, due during the term. For Lab Assignment A (due on Fri, Feb 17), 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, April 5), 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 38% of your final course grade. Assignment A = 13%; 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.
4. 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 (week of Feb 27). 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.

5. **REG Bonus:** Experiential learning is highly valued in this course, and the Department of Psychology more generally. Therefore, students can earn a "bonus" of 3% 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).

For Students Requiring Exam Accommodation

The AccessAbility Services, located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations without compromising the academic integrity of the curriculum. If you require academic accommodations, **please register with the AccessAbility Services at the beginning of each academic term.**

A Few Other Important Notes

1. 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).

2. Plagiarism and Academic Offenses

The Associate Dean of Arts has requested that all course outlines in the Faculty of Arts quote the definition of plagiarism and emphasize the gravity of this academic offense.

Plagiarism is "the action or practice of taking someone else's work, idea, etc., and passing it off as one's own."

(Oxford English Dictionary, 2nd ed., s.v. "plagiarism")

Plagiarism is academic misconduct and subject to penalties ranging from a letter of reprimand to expulsion as outlined in Policy#71, available from the Undergraduate Calendar, <https://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-71>.

The properly acknowledged use of sources is an accepted and important part of scholarship. Use of such material without complete and unambiguous acknowledgement, however, is an offense under this policy. If you have any questions, please do not hesitate to ask.

Avoidance of academic offenses: All students registered in the courses of the Faculty of Arts are expected to know what constitutes an academic offense, to avoid committing academic offenses, and to take responsibility for their academic actions. When the commission of an offense is established, disciplinary penalties will be imposed in accord with Policy #71 (Student Academic Discipline). For information on categories of offenses and types of penalties, students are directed to consult the summary of Policy #71 available from the Undergraduate Calendar, <http://ugradcalendar.uwaterloo.ca/page/uWaterloo-Academic-Integrity>. If you need help in learning how to avoid offenses such as plagiarism, cheating, and double submission, or if you need clarification of aspects of the discipline policy, ask your course instructor for guidance. Other resources regarding the discipline policy are your academic advisor and the Undergraduate Associate Dean.

Students who believe that they have been wrongfully or unjustly penalized have the right to grieve. Please refer to Policy #70 (Student Grievance) at <http://ugradcalendar.uwaterloo.ca/page/uWaterloo-Academic-Integrity>.

3. Computer and email accounts

All students should activate their UW computer accounts each term. **All faculty members are required to use UW email addresses.** For those students who wish to use alternative addresses, you must arrange for the email from your UW account to be forwarded, at your own risk.

Psychology majors should check the Psychology Undergraduate Web Site (<https://uwaterloo.ca/psychology/current-undergraduate-students>) regularly for updates (e.g., psychology course offerings for F/W/S, volunteer and/or part-time paid research positions, application deadlines for scholarships, etc.)

On the next pages is a tentative timetable of topics to be covered in lecture and lab components.

Psychological Measurement Winter, 2016-17: Lecture and Lab Components at a Glance

Week of...	Monday Lecture	Wed Lecture	Lab Thurs/Friday
Jan 2	UW closed	Review syllabus and course components	Select Groups & Overview of Lab Structure (see benchmarks)
Jan 9	The BIG PICTURE: What is Psychological Measurement and Why is it Important? (Chapter 1)	Process of Test Construction (Chapter 6, pp. 157-170, & Chapter 7 - skim)	Discuss Topic & Past Research on Construct of Interest Reacquaint with SPSS & Research Databases
Jan 16	Test Construction continued	Norms & Basic Statistics (Chapter 2) Intro to SPSS (Assignment 1: Basic Stats, posted)	Continue Refining Topic and Construct of Interest
Jan 23	Correlation & Regression (Chapter 3, omit 91-94 for now) (Assignment 2: Corr & Regress, posted) Assignment 1 Due in Class & Solutions Reviewed	Regression continued & Reviewed (+ intro to interactions in regression ☺)	Continue Refining Construct ... Begin Construct Definition & Domain Specification
Jan 30	Reliability and Measurement Error (Chapter 4, omit pp. 120-122 for now) (Assignment 3: Reliab Theory, posted) Assignment 2 Due in Class & Solutions Reviewed	Applications of Classical Test Theory	Continue Construct Definition & Domain Specification, Begin Writing Items & Instruction Set
Feb 6	Applications of Classical Test Theory Continued & Psychometrics of observation (Chapter 4, pp. 120-122) (non-graded assignment: Reliability Applications, posted)	Assignment 3 Due in Class & Solutions Reviewed Solutions to Non-graded Reliability Application Reviewed	Continue Item Writing, and Instruction Set (set up scale on Qualtrics) work on Lab Assignment A write up
Feb 13	No Lecture: Professor available in PAS 1229 for consult as needed (2:30-4:00 pm)	Midterm 1	Finalize Items and Instruction Set Finish Lab Assignment A Lab Assignment A Due: no later than Friday, Feb 17 by 4 pm to your TA
Feb 20	Rejuvenate!	Rejuvenate!	Rejuvenate!

Week of	Monday Lecture	Wed Lecture	Lab (Thurs/Friday)
Feb 27	Validity (Chapter 5) (Assignment 4: Validity, posted)	Validity continued (MMMT) Project data set up + In class review of Midterm 1 solutions	Students complete booklet (or on-line survey) of measures in lab (no exceptions)
Mar 6	Applications of Validity: Testing in Industry & Detecting Test Bias (Chapter 18 & Chapter 19)	Applications of Validity continued: Decision Theory Re-read Chpt 18, pp. 485-489) (Assignment 5: Validity Applications, posted) Assignment 4 Due in Class & Solutions Reviewed	Raw Data to Groups, Enter Data into SPSS (if needed) Preliminary Data and Syntax Preparation, Recoding Items, Creating composite scores
Mar 13	Item Analysis (Chapter 6, pp. 170-184) (Assignment 6: Item Analysis & Factor Analysis, posted)	Item Analysis & Reliability in SPSS	Data Analysis 1: Item Analysis & Reliability
Mar 20	Factor Analysis (Chapter 3, pp. 91-94) Assignment 5 Due in Class	Factor Analysis in SPSS	Data Analysis 2: Factor Analysis
Mar 27	Evaluating Convergent & Discriminant Validity Assignment 6 Due in Class	Assignments 5 & 6 Solutions Reviewed Q & A on Lecture Material to Date	Data Analysis 3: Convergent & Discriminant Validity Lab Assignment B is due next week: Wed April 5 by 4 pm
Apr 3	Bonus class for fun and enlightenment: ☺ Plotting interactions in regression	Classes over Lab Assignment B: due no later than Wed April 5 by 4 pm to your TA	

Midterm 2: Final Exam Period, Date TBA by Registrar's Office – Don't book your flights out of town before the date is announced!