

**BASIC RESEARCH METHODS**  
**Psychology 291**

**Fall 2017**

**LECTURE: Tuesday, Thursday 8:30 – 9:50 am**  
**AL 116**

**LABS: Friday 9:30, 10:30, 11:30, 1:30, 2:30, 3:30**  
**PAS 1237**

University of Waterloo  
Department of Psychology

**Instructor (Lecture):** Heather A. Henderson, Ph.D.  
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**Phone:** (519) 888-4567 ex. 31597

**Instructor (Lab):** Britt Anderson, Ph.D.  
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**Graduate Teaching Fellows:**

**Emily Chan**  
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**Christopher Lee**  
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**Required Textbook:**

Morling, B. (2014). *Research Methods in Psychology, 2e*. New York, NY: W.W. Norton & Company, Inc.  
[ISBN: 978-0-393-93693-3]

**\*\* two copies of the textbook are on reserve at Dana Porter Library\*\***

**Course Description:** This course provides an overview of research methods and the principles of experimental design that can be applied to the behavioral sciences. We will discuss the scientific concepts, principles, and ways of thinking that underlie research design. Topics to be covered include the goals of psychological research, ethical issues in the design and implementation of research studies, research design strategies and types of measurement, methods for presenting data, and appropriate interpretations of data.

**Course Objectives:**

- Students will become familiar with the logic and goals underlying research design
- Students will be able to compare and contrast basic research designs
- Students will be able to generate clear, concise scientific questions regarding psychological phenomena and be able to employ sound scientific methods for addressing their questions
- Students will be able to critically evaluate the appropriateness of conclusions drawn from a study
- Students will be able to clearly communicate the goals, design, and results of research studies

**LEARN:** Lecture slides, other course material, and announcements will be posted regularly on LEARN (<https://learn.uwaterloo.ca>). Links to online resources and information relevant to course topics will also be posted on LEARN. Make sure to check LEARN on a regular basis for these updates.

**Course Requirements and Assessment:**

<b>Midterm #1</b>	<b>25 %</b>
<b>Midterm #2</b>	<b>25 %</b>
<b>TCPS CORE Tutorial</b>	<b>3 %</b>
<b>Article Review Assignment</b>	<b>10 %</b>
<b>Lab Homework Assignments</b>	<b>5 %</b>
<b>Final Exam (Non-Cumulative)</b>	<b>32 %</b>

**[Bonus for research experience up to 3%; see details below]**

**Midterm Exams (each worth 25% of final grade):** There will be two non-cumulative mid-term exams each worth 25% of your final grade. Midterms will be a combination of multiple choice and short answer questions and will cover material presented in the textbook and during lectures. Students requesting an accommodation for the date or time of a midterm must follow official UW policies (see **Accommodation for Course Requirements** section below).

**Final Exam (32% of final grade):** There will be a final exam worth 32% of your final grade. The final exam will be a combination of multiple choice and short answer questions and will cover material presented in the textbook and during lectures. The final exam will take place during the University scheduled final exam period. Students requesting an accommodation for the date or time of a final exam must follow official UW policies (see **Accommodation for Course Requirements** section below).

**TCPS CORE Tutorial (3% of final grade):** Students are required to complete the online TCPS tutorial course on research ethics (CORE) by September 26, 2017. This online tutorial can be accessed and completed at the following link: <http://pre.ethics.gc.ca/eng/education/tutorial-didacticiel/> This course consists of a series of learning modules that provide basic instruction in the principles of ethical conduct of research with human participants. Interactive media features and online quizzes allow students to explore and test their understanding of research ethics concepts. Upon successfully completing the tutorial you will receive a certificate of completion, which you will need to upload to the Dropbox location on the

course's LEARN website before (midnight or 11:59pm) on Tuesday September 26, 2017. NOTE: It can take several days for your registration to be completed and you need to allocate several hours (probably in separate sittings) to complete the course. Therefore, you should begin this process immediately. Late assignments will be penalized 10% of the assignment points for each 24-hour period the assignment is late.

**Article Review Assignment (10% of final grade):** In this assignment, students are required to choose from a list of 10 popular press articles in which the results of an empirical research study are reported. Each popular press article is accompanied by the original empirical article. Students are required to write a 3-page analysis of the adequacy of the popular press account. Students will focus on the clarity and accuracy of the presentation of the study design, results and interpretation. Further details about the content and requirements of the assignment will be provided in an assignment guide, which will be distributed within the first two weeks of class. Assignments should be uploaded in MS Word or .pdf format to the Dropbox location on the course's LEARN website by 11:59pm on **Tuesday November 14, 2017.** Late assignments will be penalized 10% of the assignment points for each 24-hour period the assignment is late.

**Lab Homework Assignments (5% of final grade):** The goal of the laboratory is to give all psychology students a basic start acquiring the fundamental computer competencies necessary to perform psychological research and data analysis. In support of this goal there is a weekly lab with five short homework assignments, and a number of practical guided learning activities that will take place over the term. Assignments are designed to motivate students to begin to learn the Python programming language and to see its value in common psychological research scenarios. Homework assignments are due by 11:59pm the Thursday following each Friday laboratory. Each assignment is graded as 0 (not submitted), 0.5 (submitted with some effort demonstrated), 1.0 (complete assignment submitted). *Advice: Don't think of the laboratory as a burden on your grade – it should not be hard to get all the points. Think of it instead as a TA- and peer-supported opportunity to learn something special and valuable that will enhance your effectiveness in school, on the job, and in the performance of your research.*

**Class Outline:**

DATE	LECTURE TOPIC	ASSIGNED READING	LAB
<b><u>Week 1</u></b> Sept 7	Course Introduction: Producing and Consuming Research	pp. 3-8	<b>Lab #1</b> Install Python on your own computer and prove it with a screen shot.
<b><u>Week 2</u></b> Sept 12	How Psychological Science Advances	pp. 8-19	<b>Lab #2</b> Show you can access the Scratch learning site
Sept 14	Ways of "Knowing" Research vs. Personal Experience	pp. 23-38	
<b><u>Week 3</u></b> Sept 19	Finding & Reading Research Frequency, Association, and Causal Claims	pp. 39-49 pp. 55-66	<b>Lab #3</b> Python from Scratch 2-5
Sept 21	Claims and their Validity	pp. 66-81	

DATE	LECTURE TOPIC	ASSIGNED READING	LAB
<u>Week 4</u> Sept 26	<b>**TCPS CORE Tutorial DUE by 11:59pm **</b> Validity (cont)		<b>Lab #4</b> Python from Scratch 6-9
Sept 28	Research Ethics: History and Current Guidelines	pp. 89-112	
<u>Week 5</u> Oct 3	<b>*** MIDTERM #1 [Ch 1, 2, 3, 4] ***</b>		<b>Lab #5</b> Python from Scratch 10-13
Oct 5	Measures and Reliability	pp. 121-135	
<u>Week 6</u> Oct 10**	<b>No Class – Fall Break</b>		No Lab (Fall Break)
Oct 12	Measures and Validity	pp. 136-150	
<u>Week 7</u> Oct 17	Describing Behavior with Surveys and Observations	pp. 157-177	<b>Lab #6</b> Basics of Lit Searches with Google Scholar and Python
Oct 19	Sampling and Generalizability	pp. 181-197	
<u>Week 8</u> Oct 24	Correlational Research – Foundations & Interpretation	pp. 203-230	<b>Lab #7</b> Using Python to Structure Research Data
Oct 26	Correlational Research (cont)		
<u>Week 9</u> Oct 31	<b>*** MIDTERM #2 [Ch 5, 6, 7, 8] ***</b>		<b>Lab #8</b> Python for Simple Statistics
Nov 2	Multivariate Correlational Research - Interpretation & Application	pp. 235-250	
<u>Week 10</u> Nov 7	Multivariate Correlational Research (cont)	pp. 250-262	<b>Lab #9</b> Simple Data Visualizations
Nov 9	Simple Experiments – Variables, Independent Groups Designs	pp. 271-287	
<u>Week 11</u> Nov 14	<b>*** Article Review due by 11:59pm ***</b>		<b>Lab #10</b> Interaction and Report Generation
	Simple Experiments – Within Groups Designs & Interpretation	pp. 288-302	
Nov 16	Experiments – Threats to Internal Validity and Null Effects	pp. 307-338	
<u>Week 12</u> Nov 21	Factorial Designs – Design & Interpretation	pp. 343-361	<b>Lab #11</b> Doing Experiments with Python
Nov 23	Factorial Designs - Extensions	pp. 362-373	

DATE	LECTURE TOPIC	ASSIGNED READING	LAB
<b>Week 13</b>			
Nov 28	Quasi-Experimental Designs	pp. 381-398	Lab #12 Review
Nov 30	Small-N Designs	pp. 398-408	

\*\*\*\*\* FINAL EXAM [Ch 9, 10, 11, 12, 13] \*\*\*\*\* DATE & TIME TBA

### Course Policies:

**Office Hours:** If you would like additional assistance in order to achieve the goals of this course, you can schedule a meeting with me or any of the course TAs during our office hours (see top of syllabus). Given the large number of students in this class, neither the TAs nor I can accept “drop in” appointments. If you need to meet with one of us outside of our scheduled office hours, please send an email to arrange an appointment. *If you are struggling in this course for any reason, please meet with one of us as early in the semester as possible.*

### **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 [UWaterloo Academic Integrity webpage](#) and the [Arts 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. 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](mailto:reibach@uwaterloo.ca); Ph 519-888-4567 ext. 38790

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. See [Policy 70](#) and [72](#) below for further details.

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](mailto: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](#)

### **Accommodation for Students with Disabilities**

Note for students with disabilities: The [AccessAbility Services](#) office, located on the first floor of the Needles Hall extension (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**

- Students requesting accommodation for course requirements (assignments, midterm tests, final exams, etc.) due to illness should do the following:
  - seek medical treatment as soon as possible and obtain a completed uWaterloo [Verification of Illness Form](#)
  - submit that form to the instructor within 48 hours.
  - (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.

### **Official Version of the Course Outline**

If there is a discrepancy between the hard copy outline (i.e., if students were provided with a hard copy at the first class) and the outline posted on LEARN, the outline on LEARN will be deemed the official version. Outlines on LEARN may change as instructors develop a course, but they become final as of the first class meeting for the term.

## **Bonus Points for Research Experience**

[Grade breakdown: 100% course work, 3% bonus credits]

Experiential learning is considered an integral part of the undergraduate program in Psychology. Research participation is one example of this, article review is another. A number of undergraduate courses have been expanded to include opportunities for Psychology students to earn grades while gaining research experience. Since experiential learning is highly valued in the Department of Psychology, students may earn a "bonus" grade of up to **3%** in this course through research experience. Course work will make up 100% of the final mark and a "bonus" of up to **3%** may be earned and will be added to the final grade as needed to bring your final grade up to 100%. Students cannot earn a grade of more than 100%.

The two options for earning research experience grades (participation in research and article review) are described below. Students may complete any combination of these options to earn research experience grades.

### **Option 1: Participation in Psychology Research, Research Experiences Group (REG)**

Research participation is coordinated by the Research Experiences Group (REG). Psychology students may volunteer as research participants in lab and/or online (web-based) studies conducted by students and faculty in the Department of Psychology. Participation enables students to learn first-hand about psychology research and related concepts. Many students report that participation in research is both an educational and interesting experience. Please be assured that all Psychology studies have undergone prior ethics review and clearance through the Office of Research Ethics.

#### ***Educational focus of participation in research***

To maximize the educational benefits of participating in research, students will receive feedback information following their participation in each study detailing the following elements:

- Purpose or objectives of the study
- Dependent and independent variables
- Expected results
- References for at least two related research articles
- Provisions to ensure confidentiality of data
- Contact information of the researcher should the student have further questions about the study
- Contact information for the Director of the Office of Research Ethics should the student want to learn more about the general ethical issues surrounding research with human participants, or specific questions or concerns about the study in which s/he participated.

Participation in LAB studies is worth 0.5 participation credits (grade percentage points) for each 30-minutes of participation.

Participation in ONLINE studies is worth 0.25 credits for each 15-minutes of participation. Researchers will record each student's participation and will advise the course instructor of the total credits earned by each student at the end of the term.

#### ***How to participate?***

Study scheduling, participation and grade assignment is managed using the SONA online system. All students enrolled in this course have been set up with a SONA account. You must get started early in the term. For instructions on how to log in to your SONA account and for a list of important dates and deadlines please, as soon as possible go to:

<https://uwaterloo.ca/research-experiences-group/participants/sona-information>

*\*\*\* Please do not ask the Course Instructor or REG Coordinator for information unless you have first thoroughly read the information provided on this website.\*\*\**

## **Option 2: Article Review as an alternative to participation in research**

Students are not required to participate in research, and not all students want to do so. As an alternative, students may opt to gain research experience by writing short reviews (1½ to 2 pages) of research articles from empirical psychology journals relevant to the course.

*You must contact one of the course TAs to get approval for the article you have chosen before writing the review.* Each review article counts as one percentage point. To receive credit, you must follow specific guidelines. The article review must:

- **Be submitted before the last day of lectures. Late submissions will NOT be accepted under ANY circumstances.**
- Be typed
- Fully identify the title, author(s), source and date of the article. A copy of the article must be attached.
- Identify the psychological concepts in the article and indicate the pages in the textbook that are applicable. Critically evaluate the application or treatment of those concepts in the article. If inappropriate or incorrect, identify the error and its implications for the validity of the article. You may find, for example, misleading headings, faulty research procedures, alternative explanations that are ignored, failures to distinguish factual findings from opinions, faulty statements of cause-effect relations, errors in reasoning, etc. Provide examples whenever possible.
- Clearly evaluate the application or treatment of those concepts in the article.
- Keep a copy of your review in the unlikely event we misplace the original.