PSYC 301: Advanced Statistical Inference
Kingston Hall, Room 201
Mondays 11:30 am – 1:00 pm and Thursdays 1:00 pm – 2:30 pm
Fall 2019

Course Instructor: Jill A. Jacobson, Ph.D.
Email: jill.jacobson@queensu.ca
Office: Craine 318
Office Hours: By appointment – Click on "Sample Service" at the link below to schedule a meeting
http://my.setmore.com/bookingpage/cdc11dc5-c12f-48a0-806e-751124e7b7b7

Head Teaching Assistant: Erika Peter
Email: erika.peter@queensu.ca
Office Hours: By appointment

Office Hours/Appointments

You should take advantage of the opportunity to meet with the instructor and the Head TA. You also should feel free to ask questions during class/lab and/or immediately before or after it. If you are having trouble understanding the course material, please see the instructor and/or TA well in advance of the exams. We want you to do well and learn the material in this course, but we can do little to help you if you do not take the initiative. Waiting until the last minute will not be a wise strategy.

Teaching Assistants

The TAs lead the tutorials and grade the in-lab quizzes and lab assignments. They grade only the short answer questions administered via TopHat on the midterm exams. The TAs will be available for the full three hours of their scheduled lab time. Thus, they are not required to hold any additional office hours, and you are strongly encouraged to take advantage of their availability during the lab times. Also, your TA is unlikely to monitor the onQ discussion board. The Head TA and instructor will be able to answer questions about lecture and lab material. The TAs want to help you, but bear in mind that the volume of emails generated even by one lab section in this course can be enormous. So please use email conscientiously and sparingly. Unnecessary inquiries limit your TA's ability to respond to important emails. If you do have questions or need to meet with your TA, please contact your TA well in advance. If you wait until the last minute, you have no guarantee that your TA will have the opportunity to read your email and/or be able meet with you in time.

Section	Day	Time	TA	Email Address
006	Tuesday	8:30 am - 11:30 am	Erika Peter	erika.peter@queensu.ca
002	Tuesday	11:30 am - 2:30 pm	James Hillman	0jh85@queensu.ca
007	Tuesday	2:30 pm - 5:30 pm	Aki Gormezano	aki.gormezano@queensu.ca
004	Tuesday	6:30 pm - 9:30 pm	Samuel Kim	samuel.kim@queensu.ca
005	Wednesday	8:30 am - 11:30 am	Sydney Gorlick	s.gorlick@queensu.ca
003	Wednesday	2:30 pm - 5:30 pm	James Hillman	0jh85@queensu.ca
008	Wednesday	6:30 pm - 9:30 pm	Andrew Nguyen	nguyen.a@queensu.ca

Course Purpose

The primary purpose of this course is for you to become a better consumer of research. You will be expanding on the knowledge you gained in PSYC 202 (or equivalent course) and PSYC 203 to better understand statistical inference and make better judgments about what research you should or should not trust. You also will be developing marketable skills in programming and conducting statistical tests in R and translating statistical results into understandable language.

Intended Student Learning Outcomes

To complete this course, students will demonstrate their ability to:

1. Evaluate the trustworthiness of the statistical inferences made in research reports
2. Identify research practices that make statistical inferences more or less reliable and valid
3. Program and work with data in R
4. Conduct statistical analyses and simulations in R
5. Interpret and communicate the results of statistical analyses and simulations

Course Materials

Copyright

Course materials created by the course instructor, including all slides, presentations, handouts, tests, exams, and other similar course materials, are the intellectual property of the instructor, Dr. Jill A. Jacobson. It is a departure from academic integrity to distribute, publicly post, sell or otherwise disseminate an instructor's course materials or to provide an instructor's course materials to anyone else for distribution, posting, sale or other means of dissemination without the instructor's *express consent.* A student who engages in such conduct may be subject to penalty for a departure from academic integrity and also may face adverse legal consequences for infringement of intellectual property rights.

Required Free Software

R software for Windows or Mac OS. R Core Team (2013). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. URL http://www.R-project.org/.

RStudio software for Windows or Mac OS. Studio Team (2015). *RStudio: Integrated Development for R*. RStudio, Inc., Boston, MA URL http://www.rstudio.com/.

Required Subscriptions

This course requires the use of Top Hat (www.tophat.com), a classroom engagement tool that is designed to assess your understanding of course material in class and in lab. You will be able to check-in for attendance, engage in discussions and submit answers for participation grades to in-lecture questions and quiz grades for in-lab questions using iPhone, Android smartphones and tablets, laptops, or through text message. You can visit the Top Hat Overview (https://success.tophat.com/s/article/Student-Top-Hat-Overview-and-Getting-Started-Guide) within the Top Hat Success Center, which outlines how you will register for a Top Hat account, as well as providing a brief overview to get you up and running on the system. In addition to allowing for immediate response to questions in class through your device, we will be using Top Hat to allow us to go paperless and run quizzes and exams online from any personal or mobile device (e.g., laptop) in an online, secure testing environment. If you leave the browser during a test, you will be automatically locked out of the test. It is very important that you purchase your Top Hat subscription before the second lab, so that there are no complications when it is time for the first test! An email invitation will be sent to you by email the weekend of September 14-15, so please resolve all lab changes by September 13. Top Hat will require a paid subscription, and a full breakdown of all subscription options available can be found here: www.tophat.com/pricing. The subscription options are $30 per semester (4 months), $48 per year, or $96 for a four-year account. The app is available for computers, tablets, and/or smartphones. Should you require assistance with Top Hat at any time, due to the fact that they require specific user information to troubleshoot these issues, please contact their Support Team directly by way of email (support@tophat.com), the in-app support button, or by calling 1-888-663-5491.

Web Content

All readings including the weekly lab reading will be provided on onQ. Additional information for the course also will be available on onQ including links to other readings and videos and discussion forums for course questions. Because students' questions tend to be similar, **please post your queries in the appropriate onQ discussion board rather than emailing the Head TA or the instructor directly.** We will check the discussion boards regularly and will respond to your questions there. This way everyone in the class has access to the same information. If you do email questions that should have been posted on onQ, please see onQ for the reply. As in PSYC 100, the message boards are intended only as a forum for posting questions and discussing topics related to the PSYC 301 course material. Messages pertaining to inappropriate topics like mark changes, course complaints, or subjects unrelated to PSYC 301 content will be deleted, and if those messages are deemed harassing, abusive, or insulting, disciplinary action will be taken.

Calculators

No calculators will be needed for this course. All computations will be done in R.

Turnitin Statement

This course makes use of Turnitin, a third-party application that helps maintain standards of excellence in academic integrity. Normally, students will be required to submit their course assignments to Turnitin through onQ. In doing so, students' work will be included as source documents in the Turnitin reference database, where they will be used solely for the purpose of detecting plagiarism. Turnitin is a suite of tools that provide instructors with information about the

authenticity of submitted work and facilitates the process of grading. Turnitin compares submitted files against its extensive database of content and produces a similarity report and a similarity score for each assignment. A similarity score is the percentage of a document that is similar to content held within the database. Turnitin does not determine if an instance of plagiarism has occurred. Instead, it gives instructors the information they need to determine the authenticity of work as a part of a larger process. Please read Turnitin's Privacy Pledge, Privacy Policy, and Terms of Service, which governs users' relationship with Turnitin. Also, please note that Turnitin uses cookies and other tracking technologies; however, in its service contract with Queen's, Turnitin has agreed that neither Turnitin nor its third-party partners will use data collected through cookies or other tracking technologies for marketing or advertising purposes. For further information about how you can exercise control over cookies, see Turnitin's Privacy Policy. Turnitin may provide other services that are not connected to the purpose for which Queen's University has engaged Turnitin. Your independent use of Turnitin's other services is subject solely to Turnitin's Terms of Service and Privacy Policy, and Queen's University has no liability for any independent interaction you choose to have with Turnitin.

All exams, quizzes, and assignments in this course must be originally and individually written alone. If you are uncertain about what constitutes plagiarism, please see the section below labeled *Academic Integrity*. All written assignments including the midterm and final exams must be submitted to Turnitin via onQ in electronic format (e.g., Word, PDF, etc.).

Accessibility

Queen's University is committed to achieving full accessibility for people with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. The Senate Policy for Accommodations for Students with Disabilities was approved at Senate in November 2016 (see https://www.queensu.ca/secretariat/sites/webpublish.queensu.ca.uslcwww/files/files/policies/senate-andtrustees/ACADACCOMMPOLICY2016.pdf). If you are a student with a disability and think you may need academic accommodations, you are strongly encouraged to contact the Queen's Student Accessibility Services (QSAS) and register as early as possible. For more information, including important deadlines, please visit the QSAS website at: http://www.queensu.ca/studentwellness/accessibility-services/

Privacy Statement

This course makes use of Top Hat for quizzing and attendance and Turnitin for lab assignments and exams. Be aware that by logging into Turnitin, you will be leaving onQ and accessing Turnitin's website and program. Your independent use of these sites, beyond what is required for the course (for example, purchasing the company's products), is subject to each company's terms of use and privacy policy. You are encouraged to review these documents, using the links below, before using the sites.

- Top Hat - https://tophat.com/legal/privacy-policy/
- Turnitin - http://turnitin.com/en_us/about-us/privacy

Grade Scheme

There may be a time when you are unable to attend a lab for personal reasons. To build in some flexibility for all students, only the best 80% of your lab assignments and quiz questions will count toward your final grade. This universal design feature precludes your need to use the Faculty's Request for Academic Consideration without documentation portal. Should you have a documented request for more than 72 hours, please do use the portal.

LAB ASSIGNMENT TOTAL	Best 80% of lab assignments	30%
QUIZ TOTAL	Best 80% of quiz questions	15%
EXAM TOTAL	2 Exams (each = 25%)	50%
PARTICIPATION TOTAL	TopHat/attendance/etc.	5%
GRAND TOTAL		100%

Grading Method

All components of this course will receive letter grades, which, for purposes of calculating your course average, will be translated into numerical equivalents using the Faculty of Arts and Science approved scale (see below). Your course average then will be converted to a final letter grade according to Queen's Official Grade Conversion Scale (see below).

Arts & Science Letter Grade Input Scheme and Official Grade Conversion Scale

Grade	Numerical Value for Calculation of Final Grade	Numerical Course Average (Range)
A+	93	90-100
A	87	85-89
A-	82	80-84
B+	78	77-79
B	75	73-76
B-	72	70-72
C+	68	67-69
C	65	63-66
C-	62	60-62
D+	58	57-59
D	55	53-56
D-	52	50-52
F	48	49 and below

Late Policy

Late assignments and exams will be penalized two letter grades per each day late (i.e., if you earn an A on the assignment/exam, your grade will be a B+ once the penalty is applied).

Statement of Academic Integrity

Queen's students, faculty, administrators, and staff all have responsibilities for upholding the fundamental values of academic integrity; honesty, trust, fairness, respect, responsibility, and courage (see www.academicintegrity.org). These values are central to the building, nurturing, and sustaining of an academic community in which all members of the community will thrive. Adherence to the values expressed through academic integrity forms a foundation for the "freedom of inquiry and exchange of ideas" essential to the intellectual life of the University (see the Senate Report on Principles and Priorities http://www.queensu.ca/secretariat/policies/senate/report-principles-and-priorities).

Students are responsible for familiarizing themselves with the regulations concerning academic integrity and for ensuring that their assignments and their behaviour conform to the principles of academic integrity. Information on academic integrity is available in the Arts and Science Calendar (see Academic Regulation 1 http://www.queensu.ca/artsci/academic-calendars/regulations/academic-regulations/regulation-1), on the Arts and Science website (see https://www.queensu.ca/artsci/students-at-queens/academic-integrity), and from the instructor of this course. Departures from academic integrity include plagiarism, use of unauthorized materials, facilitation, forgery, and falsification, and are antithetical to the development of an academic community at Queen's. Given the seriousness of these matters, actions that contravene the regulation on academic integrity carry sanctions that can range from a warning or the loss of grades on an assignment to the failure of a course to a requirement to withdraw from the university.

Lectures

All lectures are held in Kingston Hall, Room 201. No lectures will be held on October 24 due to Fall Break or on November 28 due to an advising session led by the Psychology Department Undergraduate Office.

Laboratories

All labs are held in Humphrey Hall Room 219 and will begin during the 1st full week of classes. Laboratories will focus on: 1) a weekly quiz on lecture content from previous weeks; 2) learning to program in R via RStudio; 3) reviewing statistical techniques and conducting the tests and simulations in R; and 4) a weekly assignment to be uploaded onQ at the end of the lab.

Before your lab, you are expected to read the weekly lab reading and go through the lab slides attempting the example syntax and practice exercises (reading and slides will be posted on onQ at least one week in advance of the corresponding lab). You also are expected to attend your assigned laboratories for the full three hours and to participate in and complete all laboratory activities including saving the script for the practice exercises. If you cannot attend your regular lab one week, you may attend an alternate lab as a visitor *for that week only*. Please contact the TA whose lab you are visiting in advance to let the TA know that you will be attending and to ensure that space is available. Also, please let your regular TA know that you will be attending another lab for that week only.

Quizzes. Weekly quizzes of prior lecture material will be administered using the Top Hat app. Your final quiz grade, which is 15% of your final grade, will be based on the best 80% of the quiz questions. You must complete 80% of the quiz questions to pass this course (i.e., if you do not provide an answer for 80% of the quiz questions, you will receive a failing mark for the class regardless of your performance on the other components of the course). This universal design feature precludes your need to use the Faculty's Request for Academic Consideration without documentation portal. This course also applies the principle of universal design to give everyone extra time to write tests and quizzes.

Lab assignments. The weekly lab assignments will consist of exercises in R. These assignments will be completed during the lab, so your TA can assist you with any problems, and they must be submitted to Turnitin via onQ at the end of the lab. Lab assignments will receive letter grades, and late assignments will be penalized two letter grades per each day late (i.e., if you earn a B+, your grade will be a B- once the penalty is applied). Your final lab assignment grade, which is 30% of your final grade, will be based on the best 8 out of 10 assignments. You must complete a minimum of 8 assignments to pass this course (i.e., if you do not submit at least 8 lab assignments, you will receive a failing mark for the class regardless of your performance on the other components of the course). This universal design feature precludes your need to use the Faculty's Request for Academic Consideration without documentation portal.

Exams

The midterm exam will be completed during your regular lab time during Week 6 (Oct. 15-16). The final exam will be a take-home test uploaded to Turnitin via onQ by 11:59 pm on Friday, December 6, 2019. Both exams will receive letter grades. Each exam will be worth 25% of your final grade. You are expected to write all exams as scheduled, and you must write all exams to pass this course (i.e., if you do not write an exam, you will receive a failing mark for the class regardless of your performance on the other components of the course). For more information, see the section *Exam Absence* below. The PSYC 301 exam dates will not be changed to accommodate conflicts with your other courses' schedules. Furthermore, exams will not be moved or deferred to accommodate employment, travel/holiday plans, or flight reservations. Late exams will be penalized two letter grades per each day late (i.e., if you earn an A on the exam, your grade will be a B+ once the penalty is applied).

Exam absence. Students who cannot write an exam during the December or April exam period due to a serious, extenuating circumstance (illness, death in the family) must follow the steps below to be eligible to write a deferred exam during the Psychology Department's *Make up Exam period* in January, April/May, and September.

1. Apply for academic consideration using the Faculty of Arts and Science Portal: http://www.queensu.ca/artsci/accommodations
2. As soon as possible, follow up with your instructor(s) either by email or in-person to discuss your academic consideration request
3. If your request for a deferred exam is approved, be available to write the makeup exam the Psychology Department's Make-up Exam period in January, April/May or September, or receive '0' on the exam and fail this course. Also, note that you will not be able to enroll in PSYC 302 until you complete PSYC 301.
4. Complete and return the instructor-signed Permission for an Incomplete Grade (PDF, 256 KB) form (also available on the Arts and Science website) and return to the Undergraduate Office.

Students who do not write the make-up exam are advised to drop the course. If a student cannot write the make-up exam due to a serious extenuating circumstance for which they can provide new documentation, they will either be granted a second deferral by their instructor or be supported in their appeal to drop the course after the deadline although this decision rests with the Associate Dean (Studies).

Travel during exams. According to University regulations, students are expected to be available to write scheduled exams at any time during the official December and April examination periods as well as during any scheduled class times. Requests to write a make-up exam because of conflicting travel plans (e.g., flight bookings) or requests to miss an in-class exam due to other plans will NOT be considered except under extraordinary circumstances. Students are advised to wait until the final exam schedules are posted before making any travel arrangements.

Accommodation after the fact. Once a student has written an exam or submitted an assignment, the student may not subsequently be granted accommodation such as being offered a second opportunity to write the exam or assignment or have it count for less than originally specified in the course syllabus (reweighted). Students who cannot perform to the best of their abilities due a serious, extenuating circumstance must inform their instructor **before** attempting an exam or completing a course to arrange appropriate accommodation. Appeals to change a grade after the fact must be made to the Associate Dean (Studies) and will be supported by the Department only in exceptional circumstances.

Academic Consideration for Students in Extenuating Circumstances

Queen's University is committed to providing academic consideration to students experiencing extenuating circumstances that are beyond their control and are interfering with their ability to complete academic requirements related to a course for a short period of time. The Senate Policy on Academic Consideration for Students in Extenuating Circumstances is available at http://www.queensu.ca/secretariat/sites/webpublish.queensu.ca.uslcwww/files/files/policies/senateandtrustees/Academic%20Considerations%20for%20Extenuating%20Circumstances%20Policy%20Final.pdf Each Faculty has developed a protocol to provide a consistent and equitable approach in dealing with re-quests for academic consideration for students facing extenuating circumstances. Arts and Science under-graduate students can find the Faculty of Arts and Science protocol and the portal where a request can be submitted at: http://www.queensu.ca/artsci/accommodations. Students in other Faculties and Schools who are enrolled in this course should refer to the protocol for their home Faculty.

This course uses universal design features that preclude your need to use the Faculty's Request for Academic Consideration without documentation portal. Should you have a documented request for more than 72 hours, please do use the portal. If you need to request academic consideration for 72 hours – 3 months for this course, you will be required to provide supporting documentation and the name and email address of the instructor/coordinator. Please use the following:

Coordinator Name: **Jill Jacobson**

Coordinator email address: **jill.jacobson@queensu.ca**

Accommodations Statement

Queen's University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. If you are a student with a disability and think you may need accommodations, you are strongly encouraged to contact Student Wellness Services (SWS) and register as early as possible. For more information, including important deadlines, please visit the Student Wellness website at: http://www.queensu.ca/studentwellness/accessibility-services/

Student Code of Conduct

As a Queen's student, you are bound by the Student Code of Conduct. The code is the foundation for the university's non-academic misconduct (NAM) system, which provides a process for identifying and addressing misconduct within the Queen's community, encouraging informal resolution of grievances while taking into account the well-being of each student and the safety and well-being of the community.

PSYC 301 Course Outline 2019

Week	Date	Content
1	September 5	Introduction
	September 9	Crisis in Psychology
	September 10-11	**Lab:** R and RStudio Assignment 1 Due
2	September 12	Crisis in Psychology and Related Fields
	September 16	Crisis in Neuroscience
	September 17-18	**Lab:** Choose the Right Test Lecture Quiz 1 Assignment 2 Due
3	September 19	NHST and *p* values
	September 23	

	September 24-25	**Lab:** NHST and *p* values Lecture Quiz 2 Assignment 3 Due
4	September 26	Equivalence and Multiple Testing
	September 30	
	October 1-2	**Lab:** Equivalence and Multiple Testing Lecture Quiz 3 Assignment 4 Due
5	October 3	New Statistics: Effect Sizes
	October 7	New Statistics: Confidence Intervals and Meta-Analysis
	October 8-9	**Lab:** New Statistics Lecture Quiz 4 Assignment 5 Due
6	October 10	Guest lecture on diversity in research
	October 14	Thanksgiving - Lecture cancelled
	October 15-16	MIDTERM EXAM during lab
7	October 17	Bayesian Analysis
	October 21	Statistical Power
	October 22-23	**Lab:** Bayesian Analysis Lecture Quiz 5 Assignment 6 Due
Fall Break	October 24	No lecture
8	October 28	Statistical Power (continued)
	October 29-30	**Lab:** Statistical Power Lecture Quiz 6 Assignment 7 Due
	October 31	Sample Size Planning
9	November 4	Sample Size Planning (continued)
	November 5-6	**Lab:** Sample Size Planning Lecture Quiz 7 Assignment 8 Due
	November 7	Third Variables
10	November 11	Third Variables (continued)

	November 12-13	**Lab:** DAGs and Third Variables Lecture Quiz 8 Assignment 9 Due
	November 14	Replication
11	November 18	Replication (continued)
	November 19-20	**Lab:** Assessing Replication Lecture Quiz 9 Assignment 10 Due
	November 21	Questionable Research Practices (QRPs)
12	November 25	Best Practices Lecture Quiz 10
	November 26-27	**Lab:** Cancelled
	November 28	*Special Advising Session led by the UG Office*
EXAM	December 6	Final Exam upload on onQ by 11:59 pm