

PSYC 301: Advanced Statistical Inference  
Fall 2014

**Instructor**

Name: Amanda C. Maracle  
Email: [am218@queensu.ca](mailto:am218@queensu.ca)  
Office: Craine 403  
Office Hours: By Appointment

**Head Teaching Assistant**

Name: Maya Gupta  
Email: [maya.gupta@queensu.ca](mailto:maya.gupta@queensu.ca)  
Office: Humphrey 324  
Office Hours: Wednesdays 8:30 – 10:30

**Lecture Times**

Mondays 4:00pm – 5:30pm  
Wednesday 2:30pm – 4:00pm

**Lecture Location**

Dupuis Auditorium

**Course Objectives**

The objectives for PSYC 301 are to provide you with an understanding of statistical concepts and practise in statistical use, analysis, and reporting methods. This course aims to provide you with 1) a conceptual understanding of statistical tests, 2) the ability to make informed decisions about the appropriate use of statistical tests, 3) practical skills in analysis, and communication of statistical information, and 4) the ability critically evaluate statistical claims in scientific literature and the media.

**Course Materials**

**Copyright.** The course material including lecture notes, lab activities, etc., is copyrighted and is for the sole use of students registered in PSYC 301. This material shall not be distributed or disseminated to anyone other than students registered in PSYC 301. Failure to abide by these conditions is a breach of copyright and may also constitute a breach of academic integrity under the University Senate's Academic Integrity Policy Statement.

***Required Materials***

Lomax, R. G., & Hans-Vaughn, D. L. (2012). *An introduction to statistical concepts* (3<sup>rd</sup> ed.). New York: Routledge.  
Green, S. B., & Salkind, N. J. (2013). *Using SPSS for Windows and Macintosh: Analysing and understanding data* (7<sup>th</sup> ed.). Upper Saddle River, NJ: Prentice Hall.

***Recommended Materials***

American Psychological Association. (2012). *Publication manual of the American Psychological Association* (6<sup>th</sup> ed.). Washington, DC: Author.  
Stern, L. (2007). *What every student should know about avoiding plagiarism*. New York: Pearson Education, Inc.

SPSS and Excel for Windows or Macintosh (Student Version)<sup>1</sup>

Supplementary readings can be accessed online through the Queen's Library website (<http://library.queensu.ca>) or on Moodle.

## Web Content

Additional information for this course will be available on the web at <https://moodle.queensu.ca/login/index.php>. The web content will consist of lecture notes, lab materials, an electronic message board for course questions, a list of supplemental course readings, auxiliary study materials, and links to web pages with further, in-depth, information on selected topics. The Moodle message board is intended only as a forum for posting questions and discussing topics related to PSYC 301 course material. Messages pertaining to inappropriate topics 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 (see the section below entitled "Academic Integrity").

Because students' questions tend to be similar, **please post your queries in the appropriate Moodle forum rather than emailing the Head TA or the instructor directly.** The Head TA and the instructor will check the forums 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 in an appropriate forum, you will be directed to post your question to Moodle in order to receive a reply.

## Lectures

There are two 90 min lectures each week. Before attending each lecture, you should be familiar with the assigned reading material for that week. Given the volume and complexity of information that will be covered over the course of each term, the lectures will be designed to build on your understanding of concepts learned through reading and self-exploration of topics. While the majority of topics covered in class will overlap with the textbook, there will be cases in which topics will be covered in one but not the other. **It is your responsibility to read and be familiar with all of the course material.**

**Comprehension Quizzes.** Over the course of the semester you will be responsible for completing comprehension quizzes designed to test your understanding of concepts covered in both the readings and lectures. In total there are 6 comprehension quizzes (each worth 5%), that will be available for completion on Moodle for one week following a major section of the lecture material, and should take approximately 20 minutes to complete. These quizzes will test your understanding of key theoretical concepts outlined in the lectures and readings, and may include definitions, multiple choice, matching, and T/F.

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<sup>1</sup> Digital Copies can be purchased from the Campus Computer Store in Dupuis hall. Alternatively a student licence can be purchased from [www.onthehub.com](http://www.onthehub.com)'s eStore following verification of enrollment at a recognized university.

## Laboratories

All labs are held in Humphrey 219 and will begin Tuesday, September 16<sup>th</sup>, 2014. Labs will focus on;

1. Writing skills
2. Practical aspects of statistical analysis using various types of software
3. Active learning and critical thinking exercises
4. Working on lab assignments

Students are expected to attend their assigned laboratories for the *full three hours* each week. Students are also expected to participate in lab activities and to complete all assigned laboratory activities. Please keep in mind that in order to fully participate in lab activities you will need to bring your copy of the Green and Salkind text to every lab meeting.

### *Lab Section Teaching Assistants*

Section	Day	Time	TA	Email
006	Tuesday	8:30 – 11:30	Maya Gupta	<a href="mailto:maya.gupta@queensu.ca">maya.gupta@queensu.ca</a>
003	Tuesday	2:30 – 5:30	Haykaz Mangardich	12hm30@queensu.ca
007	Wednesday	6:30 – 9:30	Abigail Muere	abigail.muere@queensu.ca
005	Thursday	8:30 – 11:30	Jackie Huberman	<a href="mailto:7jh6@queensu.ca">7jh6@queensu.ca</a>
004	Thursday	11:30 – 2:30	Abigail Muere	abigail.muere@queensu.ca
002	Thursday	2:30 – 5:30	Haykaz Mangardich	12hm30@queensu.ca
008	Thursday	6:30 – 9:30	Meghan McKay	14mnm4@queensu.ca

The TAs will be available for the full three hours of their scheduled lab time. They are not required to hold any formal office hours; however, they may wish to make themselves available at specific times or by appointment. Therefore, you are strongly encouraged to take advantage of their availability during lab times. Your TA is unlikely to monitor the Moodle message board, but the head TA and the instructor will be able to answer questions regarding lab material. The TAs want to help you, but bear in mind that the volume of e-mails generated by even one lab section in this course is enormous, so please use e-mail conscientiously and sparingly.

If you do have questions or need to meet with your TA, please contact him/her well in advance of any due dates. If you wait until the last minute, there is no guarantee that your TA will have the opportunity to read your email and/or be available to meet you in time. Remember to always treat your TAs with respect – rude, unruly, or inappropriate behaviour towards TAs or in labs will not be tolerated (**see the section on “Academic Integrity” below**).

**Laboratory Assignments.** Written assignments will become available during scheduled lab sessions and will be due the following week at the beginning of the lab session. All written assignments must be originally and individually written (i.e., students may not work together on the analysis or write up) and will be assessed via an online plagiarism prevention program, Turnitin.com. **Please see the section below entitled “Academic Integrity” & “Plagiarism”.** All written assignments must be submitted to Turnitin.com in electronic format (e.g., Word, PDF, etc.) and follow the formatting guidelines of the 6<sup>th</sup> edition of the Publication Manual of

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the American Psychological Association. Lab assignments will be marked by the TAs and will each be worth 10% of your final grade (see “Marking Scheme” below for details). Late assignments will be penalized 5% of the assignment grade per day, for each day late.

You will be responsible for completing 2 assignments over the course of the term, covering a major components of the course. Each lab assignment will contain two sections; the first section will require you to demonstrate mastery of the practical aspects of statistical analyses (i.e. completing analyses and reporting the results), while the second will require you to demonstrate your critical thinking skills and conceptual understanding of the statistical analyses covered.

### Exams

There are two exams scheduled for this course. The midterm exam is scheduled during class time on the **Wednesday, October 22, 2014** and is worth 20% of your final grade. The final exam will be scheduled during the fall final exam period, and is worth 30% of your final grade. Students are expected to write both exams as scheduled, and you must write both of the 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). If you are unable to write either the midterm or final exam during the scheduled time, appropriate documentation of your reasons for not writing the exam must be submitted to and approved by the instructor **PRIOR** to the exam (specifically, by 5:00pm the day before the scheduled exam). Please read the section below labeled “Psychology Departmental Policies” for more information about the procedure for exam deferral.

### Evaluation

You are responsible for all lecture and laboratory material and all corresponding material in the texts and on Moodle. You are expected to write all exams as scheduled and submit projects and lab work on the indicated due date. Exceptions will be made only under relevant circumstances, and when appropriate written documentation is provided. Penalties will be applied to late projects and proposals.

**Remarking.** If you believe that an error was made in grading one of your exams or lab assignments, you must complete the re-marking form available for download from Moodle. All remarking requests should be made to the head TA. On the form, you must specify if there are specific items in dispute, or if you are requesting that the whole assignment be remarked, the nature of the error and, if necessary, supporting documentation to defend you position. Please note that the re-marked grade will stand as the final mark even if it is lower.

### Grading Scheme

COMPREHENSION QUIZZES	6 Quizzes (5% each)	30%
LAB ASSIGNMENTS	2 Lab Assignments (10% each)	20%
MIDTERM EXAM		20%
FINAL EXAM		30%
<b>TOTAL</b>		<b>100%</b>

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**Grading Method.** In this course, all components will be graded using numerical percentage marks, which will be used to calculate your final course grade. This grade will then be converted into a final letter grade using the Faculty of Arts and Science approved scale based on the Queen's Official Grade Conversion Scale.

Assignment Mark	Numerical Value for Calculation of Final Mark
A+	93
A	87
A-	82
B+	78
B	75
B-	72
C+	68
C	65
C-	62
D+	58
D	55
D-	52
F48 (F+)	48
F24 (F)	24
F0 (0)	0

Grade	Numerical Course Average (Range)
A+	90-100
A	85-89
A-	80-84
B+	77-79
B	73-76
B-	70-72
C+	67-69
C	63-66
C-	60-62
D+	57-59
D	53-55
D-	50-52
F	49 and below

## Appointments

We strongly recommend that you take advantage of opportunities to set up appointments with both the TAs and the instructor of this course. Questions before, during, or after class are always welcome, and simple questions outside of class time should be posted on Moodle for the benefit of everyone. However, if you have a question that may take some time to answer, we recommend meeting with your lab TA, the head TA, or the instructor. **If you are having trouble understanding lecture or lab material, please see someone well in advance of the exam or lab assignment due dates. Waiting until the last minute is not a wise strategy!**

## Psychology Departmental Policies

**Academic Integrity.** Academic integrity is constituted by the five core fundamental values of honesty, trust, fairness, respect and responsibility (see [www.academicintegrity.org](http://www.academicintegrity.org)). These values are central to building, nurturing, and sustaining 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/senateandtrustees/principlespriorities.html>).

Students are responsible for familiarizing themselves with the regulations concerning academic integrity and for ensuring that their assignments conform to the principles of academic

integrity. Information on academic integrity is available on the Arts and Science Calendar (see Academic Regulation 1 at <http://www.queensu.ca/artsci/academic-calendars/regulations/academic-regulations/regulation-1>), on the Arts and Science website (see <http://www.queensu.ca/artsci/academics/undergraduate/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 failure of a course, to requirement to withdraw from the university.

Discriminatory, rude, threatening, harassing, disruptive, distracting, and inappropriate behavior or language will not be tolerated in class or in laboratories regardless of the context in which such actions occur (i.e., in person, in email, on Moodle, etc.). Students are responsible for familiarizing themselves with the regulation concerning academic misconduct. Information on misconduct in an academic or non-academic setting is available in the Arts and Science Calendar (see Academic Regulation 17 at <http://www.queensu.ca/artsci/academic-calendars/regulations/academic-regulations/regulation-17>). Actions that contravene the regulation on misconduct carry sanctions that can range from a statement of apology, loss of grades, failure of a course, or requirement to withdraw from the university.

***Accommodation After the Fact.*** Once a student has written an exam or submitted an assignment, they 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 an assignment to arrange appropriate accommodation.** Appeals to change a grade after the fact must be made to the Associate Dean (Studies) and will only be supported by the department in exceptional circumstances.

***Anxiety.*** If you have previously had problems with anxiety (e.g., math anxiety, test anxiety, etc.), please make an appointment with Queens Health, Counseling, and Disability Services (HCDS) immediately. Do not wait until the week of exams. You can find their office on the second floor of the LaSalle Building, 146 Stuart Street, or call them at 613-533-2506 to set up an appointment. They have counsellors trained to assist you with anxiety and stress relief techniques, and they can determine whether or not you require special accommodations.

***Disability Accommodations.*** 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 the Disability Services Office (DSO) and register as early as possible. For more information, including important deadlines, please visit the DSO website at: <http://www.queensu.ca/hcds/ds/>.

***Exam Absence.*** Students who cannot write the final exam during the December 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 PSYC department's make up exam

period in January, April, and September.

1. Obtain permission from their instructor to write a deferred exam. This requires notifying your instructor in advance or, under extraordinary circumstances, within 72 hours after, the exam, with appropriate documentation. Appropriate documentation includes a signed letter from a registered health professional, Queens HC&DS, or documentation of a death such as a bulletin from a memorial service, obituary (newspaper or online) or funeral home letter. Official documents will be copied and originals returned to the student. \*Note\* that the PSYC department randomly checks document authenticity and that fraudulent documents will be grounds for a finding of a major departure from academic integrity. Please use the [Request for Exam Deferral form](#) and attach your documentation.
2. Complete and return the instructor-signed [Permission for an Incomplete Grade](#) form available on the Arts and Science website and return to the UG office.
3. Be available to write the makeup exam the PSYC department's make up exam period in January, April/May or September or receive '0' on the exam.

\*NOTE\*: Students who do not write the makeup exam are advised to drop the course. If a student cannot write the makeup 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 though this decision rests with the Associate Dean (Studies).

***Learning Disabilities.*** Dyscalculia is relatively rare (estimated to effect between 3 and 6% of the population), but even at this stage in your academic career, you could unknowingly suffer from it, or another learning problem that may affect your performance in this class. If you are uncertain, HCDS can diagnose you. The waiting list can get rather long, so you should make an appointment (see Anxiety above) to be tested as soon as possible.

***Plagiarism.*** It is your responsibility to be aware of what constitutes plagiarism and/or the departure from academic integrity, and what the consequences of this are. Please see Regulation 1.2.1 at <http://www.queensu.ca/arts/academic-calendars/regulations/academic-regulations/regulation-1>, the handout provided by the Writing Centre at <http://www.queensu.ca/writingcentre/handouts/Style-Plagiarism.pdf>, as well as the Stern (2007) book bundled with the Green and Salkind text.

***Special Accommodations.*** If you qualify to receive special accommodations, please notify the Head TA right away. The midterm exam is held during regular class time, so HCDS does not provide accommodations (unlike for exams held during the fall and winter exam period). Therefore, for this exam your instructor will provide the accommodation, and the sooner we are aware of the need, the more able we will be to provide it.

***Religious Observances.*** All religious observances that conflict with an assignment due date, or exam, must be declared by **Friday, September 26<sup>th</sup>, 2014**. Please contact the instructor and include the date and nature of the observance in your correspondence. Failure to declare your need for accommodation by this deadline means that your absence will not be excused and/or you will not be accommodated with an alternative due date or exam date.

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***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.



**PSYC 301 Lecture Schedule: Fall 2014**

Week	Date	Topics	Reading	Notes
1	Sept. 8	Introduction, Statistics in Science	Syllabus, Ch. 1	No lab meetings this week.
	10	Problems in Research and Summarizing Raw Data	Ch. 2, 3	<i>Comprehension Quiz 1 Available</i>
2	15	Describing Data	Ch. 3, 4	Lab meetings start this week
	17	Probability and Statistical Inference	Ch. 5	
3	22	Hypothesis Testing, Power, and Effect Size	Ch. 6	<i>Comprehension Quiz 2 Available</i>
	24	Parametric Tests (CLT) and the Single Sample, Independent and Dependant samples T Test	Ch. 6, 7	
4	29	One-Way Analysis of Variance (ANOVA)	Ch. 11 & 12 (pg. 352 – 367)	<i>Comprehension Quiz 3 Available</i>
	Oct. 1	One-Way ANOVA II		
5	6	Factorial ANOVA I	Ch. 13	
	8	Factorial ANOVA II	Ch. 13	
6	13	<b>No Class – Thanksgiving</b>	--	No lab meetings this week <b><i>Lab Assignment I due this week</i></b>
	15	RM ANOVA I	Ch. 15	Lab meetings resume this week <i>Comprehension Quiz 4 Available</i>
7	20	RM ANOVA II		
	22	<b>Midterm Exam</b>	--	In class examination
8	27	<b>Academic Advisement</b>	--	Guest Lecture – Planning for 4 <sup>th</sup> year.
	29	Proportion Tests & Chi Square	Ch. 8	
9	Nov. 3	Reliability and Validity	DeVon et al.*	<i>Comprehension Quiz 5 Available</i>
	5	Correlation I	Ch. 10, Vu et al.*	
10	10	Correlation II		
	12	Regression I	Ch. 17	
11	17	Regression II	Ch. 18	Guest Lecturer (Abi) <i>Comprehension Quiz 6 Available</i>
	19	Regression III		Guest Lecturer (Jackie)
12	24	Non-Parametric Tests and Resampling Approaches	Howel, Ch 18.* Cohen et al., Ch. 6*	<b><i>Lab Assignment II due this week</i></b>
	26	Exam Review	--	
<b>EXAM</b>	<b>TBD</b>			

\*Supplemental reading (full citations below) can be accessed online via the Queens Library at <http://library.queensu.ca/>

Cohen, J., Cohen, P., West, S.G., & Aiken, L.S. (2003). Quantitative Scales, Curvilinear Relationships, & Transformations. In *Applied Multiple Regression/Correlation Analysis for the Behavioural Sciences*, (pp. 193 – 201 & 252 – 253; sections 6.1 to 6.2.2 & 6.6). New York, NY: Routledge.

DeVon, H.A., Block, M.E., Moyle-Wright, P., Ernst, D.M., Hayden, S.J., Lazzara, D.J., Savoy, S.M., & Kostas-Polston, E. (2007). A psychometric toolbox for testing validity and reliability. *Journal of Nursing Scholarship*, 39(2), 155-164. Doi: 10.1111/j.1547-5069.2007.00161.x

Howell, D.C. (2013). Resampling and nonparametric approaches to data. In *Statistical methods for psychology*, (pp. 658 – 665). Belmont, CA: Wadsworth

**PSYC 301 Lab Schedule: Fall 2014**

Week	Date	Topics	Notes
1	Sept. 8 – 12	<b>No Labs – First Week of Class</b>	
2	Sept. 15 – 19	Introduction & SPSS	G&S Lesson 1 – 19
3	Sept. 22 – 26	Probability and Data Presentation	Descriptive Statistics Data Presentation G&S Lesson 20 – 21 Farkle
4	Sept. 29 – Oct. 3	Writing Skills Workshop, Power, Effect Size & the T Test.	Writing Results G&S Lessons 22 – 24 G*Power
5	Oct. 6 – 10	One-Way ANOVA, Midterm Review	G&S Lesson 25 Midterm Exam Review <b>Lab Assignment I Handed Out</b>
6	Oct. 13 – 17	<b>No Labs – Thanksgiving</b>	
7	Oct. 20 – 24	Factorial ANOVA	G&S Lesson 26
8	Oct. 27 – 31	RM ANOVA	G&S Lesson 29, 30 Custom Exercises
9	Nov. 3 – 7	Proportion Tests, Chi-Square	G&S Lesson 39 – 41 Custom Exercises
10	Nov. 10 – 14	Reliability & Validity	G&S Lesson 37, 38
11	Nov. 17 – 21	Correlation, Regression I	G&S Lesson 31, 32 G&S Lesson 33 – 34 <b>Lab Assignment III Handed Out</b>
12	Nov. 24 – 28	Regression II Exam Review	Custom Exercises
Exam			

**PSYC 301 List of Important Dates: Fall 2014**

Date	Time	Event	Location
Sept. 10 – 16	-	Comprehension Quiz #1	Moodle
Sept. 22 – 28	-	Comprehension Quiz #2	Moodle
Sept. 26	-	Last day to request lab section change	-
Sept. 29 – Oct. 5	-	Comprehension Quiz #3	Moodle
Oct. 13 - 17	Lab Time	Lab Assignment I Due	Turnitin.com
Oct. 15 - 21	-	Comprehension Quiz #4	Moodle
Oct. 22	2:30pm	Midterm Exam	In class
Nov. 3 – 9	-	Comprehension Quiz #5	Moodle
Nov. 17 – 23	-	Comprehension Quiz #6	Moodle
Nov. 24 – 28	Lab Time	Lab Assignment III Due	Turnitin.com
Fall Term Exam Period	TBD	Final Exam	TBD