PSYC 901: Multilevel Modeling
Winter 2026

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Student Hours: After class and by appointment.

- I have a few times I know in advance that I'll be available each week that you can sign up for without having to email me first. Just click on "Sample Service" at the link below to schedule a meeting. https://jill-jacobson.setmore.com
- If none of those times work, you don't need to send a separate email asking if we can meet. The answer is always yes. Just send me some days/times when you are free.

Course Purpose

The primary purpose of this course is to introduce you to multilevel modeling (MLM). You will be expanding on the knowledge you gained in PSYC 802 (or equivalent course) to more advanced statistical techniques. 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

By the end of this course, students will be able to:

- Understand the conceptual bases of MLM and its applications
- Conduct MLM analyses in R
- Interpret and communicate the results of MLM analyses
- Properly design studies to be analyzed using MLM (e.g., appropriately powered data collections, etc.)

Course Materials

Copyright of Course Material

Course materials created by the course instructor, Jill A. Jacobson, including all slides, presentations, handouts, tests, exams, and other similar course materials, are the intellectual property of the instructor. 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 may also face adverse legal consequences for infringement of intellectual property rights.

Required

R software for Windows or Mac OS. R Core Team (2025). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. URL http://www.R-project.org/. **Price**: Free

RStudio software for Windows or Mac OS. RStudio Team (2025). *RStudio: Integrated Development for R*. RStudio, Inc., Boston, MA URL https://posit.co/downloads/ **Price**: Free

Recommended

American Psychological Association. (2019). *Publication Manual of the American Psychological Association* (7th ed.). Washington, DC: Author. **Price at the APA website**: $31.99 USD

Baruffa, O. (2025). *The Big Book of R*. https://www.bigbookofr.com/ This compilation of 300+ free R books and resources includes the two I most often recommend when learning R, Navarro's *Learning Statistics with R* and Wickham and Grolemund's *R for Data Science*. **Price**: Free

Lecture slides, other readings, and additional course materials will be posted on onQ.

Course Components

Lectures/Laboratories. One 110-minute lecture/lab is scheduled for each week. Slides for the lecture portion will be available on onQ at least one hour before the lecture is scheduled to begin. The laboratory portion will focus on practicing techniques in R by working on a short lab assignment. The lectures and labs provide active engagement, promote a deeper understanding of the course content, and contribute to your success not just in this course but in your academic career. Your presence in lecture and participation in lab contribute to the knowledge and skills that you will develop. I expect you to attend all class meetings to take advantage of these times, which are already built into your schedules, to learn the course material and to complete the lab assignments.

Lab assignments. The lab assignments will consist of answering questions about activities or demonstrations intended to enhance understanding of material covered in lecture and/or completing exercises in R. I understand that this course is an elective, so my goal is to keep the assignments as short as possible. I will give you time to complete the assignment during the class meeting, so I can assist you with any problems. You must complete all 3 lab assignments to pass the course (i.e., if you do not, you will receive a failing mark for the class regardless of your performance on the other components of the course). The lab assignments are due by 10:00 pm on the date they are distributed but see below under "Assignment Submission Policy" about the built-in 3-day grace period.

Final Project. Students must complete the final project to pass this course (i.e., if you do not, you will receive a failing mark for the class regardless of your performance on the other components of the course). The final project primarily will involve conducting analyses and writing up a briefer version of an APA-style paper. Because learning is enhanced when an activity is relevant, you will need to use **hierarchical/nested/repeated measures/dyadic** data that you, your advisor, or your lab already has collected. If you do not have the necessary data but want to use data available in R or online, please get my approval prior to the final project due date and provide the link to the data in your write up. **You cannot use open data for which the code necessary for the final project is available as well. Also, you may not submit the same assignment you used for PSYC 802.** I also can assist you in finding or simulating data if you do not have access to any, or your data collection is not yet finished. The final project must be submitted in electronic format (e.g., Word, PDF, etc.) on onQ by 5 pm on the date listed in the Course Outline but see below under "Assignment Submission Policy" about the built-in 3-day grace period.

Assignment Submission Policy

Please see Queen's Graduate School policy on accommodation and academic consideration (including the relevant forms) at https://www.queensu.ca/academic-calendar/graduate-studies/admission-registration/ (scroll down to "Accommodation for Graduate Students with Disabilities"). To build in flexibility and promote accessibility and inclusion for all students, this course uses universal design including built-in grace periods where possible.

Written Submissions. All written assignments will be submitted in electronic format (i.e., Word, PDF) on onQ. They must be originally and individually written including the R code and must follow the format of the 7th edition of the *Publication Manual of the American Psychological Association.* All written assignments have a built-in 3-day grace period, which aligns with the policy for Academic Considerations. If you have extenuating circumstances when a submission is due, and these circumstances will last up to 3 days, you can use the grace period without applying for formal Academic Considerations through the Portal. The grace period is automatically applied to papers submitted up to 3 days late (e.g., submitted before 10:00 pm on the Sunday following the lab assignment's Thursday due date). However, if your circumstances will last more than 3 days, and you have documentation, please use the Academic Considerations Portal. If you have accommodations that allow you to have extensions on assignments, the extension time begins the day assignment is due, not at the end the 3-day grace period. The grace period is part of your extended time.

Late Policy: Late assignments and final projects submitted beyond the grace period will be penalized 1 letter grade per day that they are late unless arrangements have been made. So, for example, if your initial grade for a lab assignment was an A, but the document was submitted after 10:00 pm on the Sunday following the lab assignment's Thursday due date, your final grade for the lab assignment will be an A-.

Statement of Academic Integrity

All written assignments in this course must be originally and individually written. If you are uncertain about what constitutes plagiarism, please review Queen's Graduate School policy on academic integrity at https://www.queensu.ca/academic-calendar/graduate-studies/academic-integrity-policy/ .

Generative Artificial Intelligence (AI) Tools

Students must submit their own work and cite the work that is not theirs. Generative AI tools such as ChatGPT are permissible only when explicitly noted in the assignment instructions and you have sought and received prior approval from me. In these cases, you must cite the material that they generate. Any other use constitutes a Departure from Academic Integrity.

Student Code of Conduct

As a Queen's student, you are bound by the Student Code of Conduct available for review at https://www.queensu.ca/secretariat/sites/uslcwww/files/uploaded_files/policies/board/StudentCodeOfConduct.pdf. 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.

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 through onQ to Turnitin. 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 plagiarized text in this course. Data from submissions is also collected and analyzed by Turnitin for detecting Artificial Intelligence (AI)-generated text. These results are not reported to your instructor at this time but could be in the future.

Turnitin is a suite of tools that provide instructors with information about the authenticity of submitted work and facilitates the process of grading. The similarity report generated after an assignment file is submitted produces a similarity score for each assignment. A similarity score is the percentage of writing that is similar to content found on the internet or the Turnitin extensive database of content. 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.

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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.

Evaluation

You are responsible for all lecture and laboratory material and all corresponding material on onQ. You must complete all 3 lab assignments and the final project to pass this course. You also are expected to adhere to the indicated due dates (see the "Assignment Submission Policy" for more details including the late policy). Exceptions will be made only under relevant circumstances. Exams and assignments due in other courses will not be sufficient grounds for excusal, and the PSYC 901 due dates will not be changed to accommodate conflicts with your other courses' schedules. No extra credit opportunities will be offered.

Summary of evaluation components (all are required):

PARTICIPATION TOTAL	Attendance	10%
ASSIGNMENT TOTAL	3 Lab Assignments	40%
FINAL PROJECT TOTAL	1 Final Paper	50%

Weighting of evaluation components: The remaining 3 lab assignments will be averaged together and worth 40% of your final grade. The final project will be worth 50% of your final grade, and participation will be worth 10%.

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

PSYC 901 Course Outline Winter 2026

Week	Date	Topics*	Lab Assignment
1	January 8	Introduction and Review	
2	January 15	Random Intercept Models	
3	January 22	Random Slope Models and Cross-Level Interactions	
4	January 29	Multilevel Modeling in R	#1
5	February 5	Effect Sizes, Power, and Missing Data	
6	February 12	Analysis of Repeated Measures	
Reading Week			
7	February 26	Intensive Longitudinal Designs	#2
8	March 5	More Complex Models: 3 Levels, MMLM, and Cross-Classified	
9	March 12	Mediation and Logistic/Generalized Linear Models	
10	March 19	MLM Using an SEM Framework	
11	March 26	Dyadic Data Analyses	#3
12	April 2	MLM Alternatives and Other Applications	
Exam	April 21	Final Project Due on onQ by 5 pm	

**Weekly readings and resources to supplement the lecture and lab material will be posted on onQ.*