

**Department of Psychology**  
**PSYC 3015Y- Advanced Statistics and Research Design**  
**FALL/WINTER Full Year Course 2011 OSHAWA**

Instructor:	Rebecca Nader	Teaching Assistant:	TBA
Trent email:	<a href="mailto:rebeccanader@trentu.ca">rebeccanader@trentu.ca</a>	Trent email:	TBA
Office Hours:	Wed 2:30pm – 4:30pm	Office Hours:	TBA
Location:	Thornton Faculty Wing Cubicles		
Psychology Dept:	LHS C104, 705-748-1011 ext. 7535		

**Course Description:** Psychology 3015 provides an intensive study of the design and analysis of experimental and correlational research in psychology. Psychology 3015 reviews and builds on the basic concepts and statistical techniques introduced in Psychology 2016/2017 and emphasizes the appropriate selection, use and interpretation of these techniques with respect to research data.

The course provides coverage of:

1. **Descriptive Statistics** including: variables, measurement and scales; measures of central tendency and variability; probability theory; discrete probability distributions and functions (e.g., binomial distribution); continuous probability distributions and functions (e.g., unit normal distribution);
2. **Hypothesis Testing and Inferential Statistics** including: Z-test; t-test; normal approximation to the binomial distribution; non-parametric statistics; chi-square distribution -- test of independence and test of goodness of fit;
3. **Correlation and Regression** including: Pearson product-moment correlation; Spearman rank-order correlation; phi coefficient; point-biserial coefficient, biserial correlation; tetrachoric coefficient; rank-biserial correlation coefficient; regression analysis and equation; part and partial correlation; multiple regression and correlation;
4. **Analysis of Variance Techniques** including: one-way between-subjects ANOVA; factorial between subjects ANOVA; within-subjects ANOVA; mixed between-within-subjects ANOVA; design complexity; specific comparisons;
5. **Analysis of Covariance Techniques** (e.g., one-way ANCOVA) and
6. **Multivariate Analysis of Variance and Covariance Techniques**
7. **Factor Analysis**

**Course Prerequisite:** 8.0 University credits and 60% or higher in PSYC 2016 and 2017 (or 215)  
<http://www.trentu.ca/calendar/>

**Course Format:** **Lecture:** Wednesday 5:30pm – 8:30pm  
**Workshop:** Monday 6:30pm – 8:30pm  
 OSHAWA weblink to academic timetable <http://www.trentu.ca/oshawa/CurrentSchedule.htm>

**Required Readings:** American Psychological Association (2010). *Publication manual of the American Psychological Association* (6<sup>th</sup> ed). Washington, DC: Author.

Kennett, D.J., Young, A.M., & Nobels, P.J. (2009). Part 1 - *Notes on applied statistical methods in psychology integrating STATISTICA software (3<sup>rd</sup> Ed.)*. Peterborough, ON: Trent University.

Kennett, D.J., Young, A.M., & Nobels, P.J. (2009). Part 2 - *Notes on applied statistical methods in psychology integrating STATISTICA software (3<sup>rd</sup> Ed.)*. Peterborough, ON: Trent University.

Kennett, D.J., Young, A.M., & Nobels, P.J. (2008). *Applied statistics interfaced with WebSTATISTICA* (2<sup>nd</sup> Ed.). Peterborough, ON: Trent University.

Table of distributions to accompany the notes by Kennett, Young, & Nobels (2009).

Summary booklet of course equations for tests and examinations. (Note: This booklet, Table of distributions, and calculator are the only materials students are allowed to bring to tests/exams.)

Pp. 4-6, 113-117, 138 from, Mitchell, M. L., Jolley, J. M., & O’Shea, R. P. (2007). *Writing for psychology* (2<sup>nd</sup>ed.). Belmont, CA: Wadsworth.

Recommended Text: Mitchell, M. L., Jolley, J. M., & O’Shea, R. P. (2007). *Writing for psychology* (2<sup>nd</sup> ed.). Belmont, CA: Wadsworth.

Evaluation:	1. Test #1 (Oct 1, 2011)	15%
	2. Test #2 (Dec 7, 2011)	15%
	3. Test #3 (Feb 29, 2012)	15%
	4. Final Examination (Final Exam period)	20%
	5. Assignment #1 (Nov 23, 2011, at 6:30pm)	15%
	6. Assignment #2 (Mar 21, 2012, at 6:30pm)	20%

It is the responsibility of each student to read and accept the due dates outlined on the course syllabus

- Learning Outcomes: Students successfully completing this course will:
1. Be able to identify the proper tests to use to analyse data
  2. be able to properly interpret results
  3. understand the concepts of probability
  4. be able to understand the results sections of journal articles

Explanation of Assignments

**Tests and Examinations:** Tests are 2 hours and 50 minutes in duration, and examinations are 3 hours in duration. Students are allowed to bring **ONLY** the **Summary booklet, calculators** and **Table of Distributions** to tests/examinations. It is students’ responsibility to remember these items. Students are encouraged to make as many summary notes as they wish within their *Summary booklet*. Sharing notes and calculators with other students, cell phones and palm-pilots are **NOT** allowed during tests/examinations without academic penalty. Violating student(s) will be asked to leave and will receive a zero grade on that course component.

The first test, will count 15% toward the final grade. The second test, will cover all material in the first term of the course and will count 15% toward the final grade. The third test and final exam, will count 15% and 20% toward the final grade, and will cover all course material preceding the test dates.

Because tests/examinations in Psychology 3015Y are of a different format than students have been formerly exposed to (i.e., problem sets versus multiple choice questions), sometimes students get off “on the wrong foot” in the first test, but they do much better on the 2<sup>nd</sup> and 3<sup>rd</sup> tests. If you happen to be one of these students, your first test will be weighted out of 10% (versus 15%) and tests 2 and 3 will be weighted out of 17.5% (versus 15%).

**Assignments:** Thirty-five percent will be allocated for performance on two assignments. Assignments are **due at 5:00pm, before class begins** on their given due date. These due dates are indicated in the syllabus. Late assignments will **NOT** be accepted! Assignments are aimed at preparing students for conducting research. Your task will be to answer particular research questions, using appropriate statistical techniques. In contrast to tests/examinations, assignments will require the use of *WebSTATISTICA*. Also, all assignments will involve your participation with the research. Fifteen percent (15%) of Assignment 1 and 15% of Assignment 2 grades are based on data entry (5%) at Times 1, 2, and 3, and data management (5%) at Times 1, 2, and 3. Data entry for Times 1 and 2, and data management for Time 1 will be assigned to Assignment 1. Data entry for Time 3, and data management for Times 2 and 3 will be assigned to Assignment 2.

Course Policy on Late Submissions      Assignments are due at the beginning of class on their assigned due date, no later. Late assignments will not be accepted without valid documentation relating the problem to a serious medical or personal matter.

Course Policy on attendance in class/workshops      **It is expected that students will attend all lectures, lecture notes will not be posted on My Learning System.**  
Attendance is also expected at workshop. All assignments will involve your participation with the research. Ten percent (10%) of Assignment 1 and 10% of Assignment 2 grades are based on the Sona Surveys (5%) at Times 1, 2, and 3, and the data management workshop (5%). Sona survey for Times 1 and data management workshop will be assigned to Assignment 1. Sona surveys for Times 2 and 3 will be assigned to Assignment 2.

### Helpful Hints for taking personal charge of your PSYC 3015Y behaviour:

**Lecture and Workshop Attendance:** Attendance will be recorded at all workshops, even though no grades will be allocated for attending. Our research reveals that students attending more lectures and workshops are more likely to receive higher grades. Additionally, it is easier for us to approach typical problems students face if we know that they have been attending all classes.

**PSYC 2016/2017 Review Quiz:** During your first workshop, you will have 1 hour to complete a quiz assessing your knowledge of Psychology 2016/2017. This quiz is designed to let students know how prepared they are for Psychology 3015Y. Psychology 3015Y assumes that students are coming into the course with a reasonably strong understanding of basic mathematics and of the concepts discussed in Psychology 2016/2017. Students failing the PSYC 2016/2017 review quiz should consult the Academic Skills Centre immediately for remedial help.

**Review Quizzes:** The review quizzes are designed to let students know how prepared they are for the upcoming Psychology 3015Y tests/examinations. Each of the four quizzes can be completed on WebCT, and will be made available to students on the day of the lecture, preceding the test/exam day (see syllabus). Students have until the test day to complete the quiz. Immediate performance feedback is provided.

Have **COURTESY** and **RESPECT** for your peers and the instructors of the course. We expect you to come to class on time, to save your chatter until break time or after the class, and not to leave freely for coffee and other snacks in midst of a class. In short, we prefer that students **NOT** attend class, if they are attending for social reasons or to simply sign the attendance sheet.

**DO NOT PURCHASE WORKBOOKS FROM PREVIOUS YEARS!** Used books are not effective learning tools. It is imperative that you understand the basic concepts and content covered in PSYC 2016/. PSYC 3015Y also requires a competence level of grade 10 algebra. If this is going to be problematic for you, we recommend that you go to Academic Skills Centre immediately, for remedial help. Their services are free of charge.

**Develop regular study habits.** As with all of your courses, you should be spending at least two days a week on this course. Reviewing class notes and doing problem sets, at the end of each chapter, on a regular basis will ensure that any aspects not understood can be cleared up as you go. Don't assume that difficulties will go away magically! Be proactive in addressing concerns as they arise. Remember, we are here to help.

**Don't hire a tutor expecting them to do the work for you, because, we guarantee, that you will be disappointed!** If you develop regular study habits and adhere to the helpful hints provided here, students **SHOULD NOT NEED A TUTOR.**

It is your responsibility to write **TESTS** and **EXAMINATIONS** when scheduled. Make certain that you and others plan vacations and other events outside of these scheduled dates.

PSYC 3015H-Y Fall/Winter 2011/2012 Schedule

Date	Topic	Reading	Workshop Topic
Sept 14	Course overview; Discussion of basic statistics including measures of central tendency & variability	Ch.1	No Workshops
Sept 21	Probability theory; Binomial & Chi-square distributions; discrete versus continuous probability distributions of functions	Ch.2	Introduction to Webstatistica, Sona account setup, Pettis' project and new file set up. Textbook Chapter 1 & Part D (Pettis' Project) <i>(5% of assignment grade is for completion of Time 1 questionnaires on Sona. Deadline Friday Sept 26 at 0900)</i>
Sept 26			Complete Survey Time 1 by 9am
Sept 28	Binomial & Chi-square distributions; discrete versus continuous probability distributions of functions, Chi square tests for independence and goodness of fit.	Ch.3	Data Management (class attendance required-see Course Policy; 5% of assignment grade for attendance). Chapter 2.
Oct 5	Sample & interval estimation; hypothesis testing; power	Chs. 4 & 5	Descriptive Statistics. Chapter 4
Oct 12	t-distribution; non-parametric tests	Chs. 6 & 7	Review before Test #1
Oct 19	<b>TEST #1</b>		No workshop <i>(5% of assignment grade is for completion of Time 2 questionnaires on Sona towards Assignment 2. Deadline Friday Nov 4 0900)</i>
<b>Oct 26</b>	<b>NO CLASSES – Reading Week</b>		
Nov 2	Simple Linear Regression & Correlation	Chs. 8	Grouping and Chi-square. Chapters 3 & 7.
Nov 9	Simple Linear Regression & Correlation	Chs. 8 & 9	t-tests; Power & Confidence intervals. Chapter 11.
Nov 16	Multiple Regression & Correlation	Ch. 9 & 10	Correlation and Simple Linear Regression. Chapter 9.
Nov 23	Multiple Regression & Correlation <b>ASSIGNMENT #1 DUE</b>	Ch. 10	Stepwise Multiple Regression. Chapter 10
Nov 30	Advanced Regression & Correlation – cleaning up; Review	Chs. 9 & 10	Review before Test #2
Dec 7	<b>TEST#2 – Material up to Nov 30</b>		<b>TEST #2 – material up to Nov 30</b> <i>Students are required to complete Time 3 questionnaires for the assignment project on Sona. Deadline Friday Jan 20 at 0900.</i>
Jan 11	Introduction to Analysis of Variance – One-way Between Subjects; Kruskal Wallis H test	Chs. 11 & 16	Standard & Hierarchical Multiple Regression. Ch. 10
Jan 18	Multiple Comparisons	Ch. 12	Grouping revisited; One-way between subjects ANOVA. Chapters 3 & 12.
<b>Date</b>	<b>Topic</b>	<b>Reading</b>	<b>Workshop Topic</b>
Feb 1	Trend Analysis	Ch. 12	Assignment Workshop
Feb 8	ANOVA Assumptions; Analysis of Covariance	Chs. 13 & 14	Trend Analysis Chapter 14

Feb 15	Analysis of Variance – one-way within subjects; Friedman test	Ch. 15 & 16	Review Before Test 3
Feb 22	NO CLASSES – Reading Week		
Feb 29	TEST #3 – Material up to Feb 15		No Workshop
Mar 7	Analysis of Variance – overview; two and three factor designs	Ch. 17	Analysis of variance: One-way within subjects design Chapter 16
Mar 14	Analysis of Variance – two way and between groups factorial designs	Ch. 18 & 19	Analysis of Covariance or analysis of variance; two and three factor designs; mixed designs (depending on assignment parameters) Ch. 15 & 17
Mar 21	Analysis of Variance – two way within subjects and mixed designs <b>ASSIGNMENT #2 DUE</b>	Ch. 20 & 21	Analysis of Covariance or analysis of variance; two and three factor designs; mixed designs (depending on assignment parameters) Ch. 15 & 17
Mar 28	Multivariate Analysis of Variance & Covariance; Factor Analysis	Ch. 22	Review Before Final Exam
Apr 5	Review for Final Exam	Ch. 23	No workshop – individual help is available during workshop time
<b>Final Examination</b>			

### University Policies

#### ACADEMIC INTEGRITY:

Academic dishonesty, which includes plagiarism and cheating, is an extremely serious academic offence and carries penalties varying from a 0 grade on an assignment to expulsion from the University. Definitions, penalties, and procedures for dealing with plagiarism and cheating are set out in Trent University's *Academic Integrity Policy*. You have a responsibility to educate yourself – unfamiliarity with the policy is not an excuse. You are strongly encouraged to visit Trent's Academic Integrity website to learn more – [www.trentu.ca/academicintegrity](http://www.trentu.ca/academicintegrity).

#### ACCESS TO INSTRUCTION:

It is Trent University's intent to create an inclusive learning environment. If a student has a disability and/or health consideration and feels that he/she may need accommodations to succeed in this course, the student should contact the Disability Services Office (DSO office #111, 905-435-5100) [disabilityservices@trentu.ca](mailto:disabilityservices@trentu.ca) as soon as possible. Complete text can be found under Access to Instruction in the Academic Calendar.

### Departmental Policy on Tests, Exams, and Assignments

#### A. MIDTERMS & FINAL EXAMINATIONS

Midterm examinations for half courses within the Psychology Department are scheduled by the instructor of the course. Midterm examinations for full courses and final examination for all courses are scheduled by the Registrar's Office. Students are strongly urged NOT to make any commitments (i.e., vacation, job related, or other travel plans) during either the term as a whole or the final examination period. Students are required to be available for all examinations during the periods for which they are scheduled (as published in course syllabi).

#### B. DEFERRAL OF MIDTERM / FINAL EXAMINATIONS and/or TERM WORK

Extensions of deadlines for completion of assignments or writing of midterms/final examinations may be granted to students on the basis of illness, accident, or other extreme and legitimate circumstances beyond their control. Consideration for deferrals will not normally be granted on the basis of vacation/travel plans or job-related obligations.

#### C. SUPPORTING DOCUMENTATION

Students should expect that supporting documentation will be required and must be submitted before a deferral is approved. For illness or accident, supporting documentation will take the form of: (1) the Trent University Medical Certificate from Health Services: (<http://www.trentu.ca/healthservices/medical.html>), or (2) a certificate or letter from the attending physician clearly indicating the start and end dates of the illness and the student's inability to write an examination, complete assignments, and/or attend classes, as relevant to the particular request. For other circumstances, students should consult the individual Psychology faculty member about acceptable forms of documentation.

## Notes

### 1. Academic Integrity:

For the purpose of interpreting and applying the University policy on academic dishonesty, the Department of Psychology has adopted the following:

*When a student submits a piece of written work in fulfillment of an assignment, he/she implicitly acknowledges the following: a) that she/he is the sole author of the work; b) that the wording and organization of the work, apart from acknowledged quotations, is her/his own; and c) that she/he has not and will not submit this work, either as a whole or in part, to satisfy another course requirement. These basic assumptions will be reasonably interpreted. They do not preclude collaboration between students upon a single project, by prior arrangement with the instructor, for shared academic credit (either for written or oral presentation).*

For an elaboration of the Department's policy on, and for specific examples of, plagiarism, students should consult the sections on academic honesty (pp. 6-8), and appropriate citing and referencing (pp. 135-137, 169) in Mitchell et al. (2010). Students who have doubts about what might be considered academic dishonesty are urged to consult the instructor of the course. Ignorance of the University or Department policy does not excuse academic dishonesty. Submissions that fail to meet one or more of these considerations will be subject to procedures laid down in the policy on academic dishonesty as stated in the University calendar.

2. It is the policy of the Department NOT to accept faxed assignments.
3. The same assignment cannot be submitted in more than one course without the prior written permission of all instructors concerned. The written approval must be attached to the work when it is submitted.
4. Students are required to use American Psychological Association style (6<sup>th</sup> edition).
5. Please see the Trent University academic calendar for University Diary dates, Academic Information and Regulations, and University and departmental degree requirements.
6. Last date to withdraw from a Fall/Winter full-term course without academic penalty in 2010-2011 is February 7, 2012.