

# Psychology 2030: Methods and Statistics

Psychology 2030 is intended as a gentle introduction to the scientific methods and statistical techniques commonly used in psychological research. Emphasis is on these methods and statistics as ways of thinking about observations and phenomena, rather than on the blind application of research designs and mechanical aspects of calculation. An ability to read and to understand the original scientific literature is the ultimate goal; comprehension of research designs and statistical methods as tools as opposed to virtuosity with a hand calculator and mystical equations is the proximate goal. To that end, lectures and discussion will critically examine induction and statistical thinking in the context of everyday claims in medicine (e.g., the benefits of "screening", interpreting test results, claims for the efficacy of "alternative" medicine, etc.), epidemiology, law (e.g., the reliability of fingerprint identification, DNA "fingerprinting", etc.), and so on. Many will find that these discussions may challenge one or another of their core or long-held beliefs. Good. How to mount these challenges and to engage in critical thinking about everyday claims represent the fundamental "take-home" messages of the course.

## Textbooks

The other critical aspect of the course is the introduction to statistics as used by experimental psychologists. As such, the emphasis is on the use of statistical techniques as actually occurs in experimental psychology, rather than on an introduction to statistics as a mathematical discipline. All of the materials for this aspect of the course, and some others (e.g., writing in APA style), have been collected into a book by John R. Vokey and Scott W. Allen, entitled *Thinking With Data (Fifth Edition)*. These lecture notes are available at the cost of printing and distribution from the bookstore. The latest version is always available in portable document format (pdf) on the web at: <http://people.uleth.ca/~vokey/pdf/thinking.pdf>. A complementary book for the course is *How to Lie With Statistics*, by Darrell Huff (W. W. Norton & Company, 1993), which has been in print for over 50 years! It is fun, and funny, and filled with insights.

## Evaluation

Evaluation will consist of *three take-home exams*, each worth 1/3 of your final grade. The first of these will be made available Thursday, October 8, 2009 to be submitted no later than the following class, **Wednesday, October 14, 2009**; the next will be made available on Thursday, November 12, 2009 to be submitted the following class, **Wednesday, November 18, 2009**; and the final will be made available Thursday, December 10, 2009 to be submitted to the course drop-box in the Psychology Department no later than **Wednesday, December 16, 2009**. Each take-home exam will consist of an equal mixture of 5 computational and 5 expository questions, of which you choose 6 to answer. The values in the following conversion table will be used as a guideline to convert scores out of 100% to minimum letter-grades, although the instructor reserves the right to adjust individual grades upward to reflect such aspects of performance as a marked improvement over the semester.

Score	Grade	Score	Grade	Score	Grade	Score	Grade
90-100	A+	77-80	B+	67-70	C+	57-60	D+
85-90	A	73-77	B	63-67	C+	50-57	D
80-85	A-	70-73	B-	60-63	C-	< 50	F

## Experimental Research Participation

This course is designed to provide students with an opportunity to participate in active research programs of faculty members. Calls for volunteers to assist in these projects will be made during the semester, in class or via e-mail. If you are asked to volunteer, and you accept, each project usually requires one hour or less of your time, but this will depend on the individual research project. In recognition for your time, and in recognition that you are learning something about the discipline of psychology, beyond what you would in the normal classroom environment, an extra credit of 1 to 2% for each study in which you participate will be added to your total grade to a maximum of 5% (so, it is theoretically possible to score 105%). Note that there is no guarantee that all students will be able to achieve the maximum extra credit. These extra credits are added only after all grade cutoffs have been established such that students who choose not to participate are not disadvantaged. Please check with the Research Assistant for the Experiment to ensure that you have not completed this study previously or have done a similar study.

## Questions and Discussion

All questions and discussion about the course material should occur during class time, including questions and discussion about the exams, so that all students benefit from the discussion. The first part of each class has been explicitly set as a question and answer period, although students are encouraged to ask questions at anytime during the class. This is especially important as we meet only once a week. Failing that, students are encouraged to post their questions and commentary to the class email list: <[psyc2030n@uleth.ca](mailto:psyc2030n@uleth.ca)> both to invoke discussion, and to receive clarification (if needed) from the instructor and TAs for the course; doing so will most often result in a prompt and considered response. Grades and various supplementary materials will be made available via Blackboard/WebCT <<http://courseware.uleth.ca>>, so be sure to familiarize yourself with system.

## Calculator

A good hand-calculator will prove useful for the course. At a minimum (beyond the standard arithmetical functions), the calculator must have a *square-root* function. More sophisticated functions, such as summation, factorial, permutations and combinations, standard deviation, correlation, etc., may prove useful, but are not essential. As most of you no doubt have a personal computer, the software calculator on your computer is probably more than adequate. Similarly, any and all of the statistics discussed in the course may be conveniently calculated via a computer spreadsheet, but, again, a computer spreadsheet is not essential.