

THE UNIVERSITY OF LETHBRIDGE
FACULTY OF HEALTH SCIENCES
HLSC/PSYC 3450 – APPLIED STATISTICS FOR CLINICAL PRACTICE
Course Syllabus – Spring, 2013
Designed by Brad Hagen and Peter Kellett

“I always find that statistics are hard to swallow and impossible to digest. The only one I can ever remember is that if all the people who go to sleep in church were laid end to end, they would be a lot more comfortable.”

~Mrs. Robert A. Taft

“There are three kinds of lies - lies, damned lies and statistics.”

~Benjamin Disraeli

“Statistics are human beings with the tears wiped off.”

~Paul Brodeur



COURSE DESCRIPTION:



“Statistics.” The word itself is usually enough to strike fear into the hearts of most students – and is about as popular as other words like “cancer,” “root canal,” “student loan repayments,” and “APA format.”

Fortunately, taking a statistics course doesn't have to be like a semester-long version of the worst episode of “Fear Factor” you've ever seen. In fact, taking a course in statistics *should* actually be interesting, enjoyable – and dare we say...fun?

As clinicians and practitioners in health-related/clinical disciplines, you do need to understand how numbers and statistics are used in fields like nursing, addictions counseling, public health, psychology, and so on. Much of the “evidence” used in evidence-based practice – in addition to many budget-related decisions – is grounded in numbers, data and statistics. In addition, many people in life will be trying to persuade you to do or buy things based upon statistics, so you need to know when you're being given the ‘real goods’ – or when people are simply ‘lying with statistics.’

The purpose of this course is to give any undergraduate student – but particularly students in health sciences and psychology – a good foundational understanding of how quantitative data (numbers) and statistics are used as part of evidence-based professional practice. As such, this course will focus on the *practical understanding and application* of statistics, as opposed to a more theoretical understanding of statistics. Therefore, you will be working with real data sets, and trying to solve real problems.

COURSE INSTRUCTOR:

Your instructors for this course can be *best* reached by email, and will endeavor to get back to you within 48 hours (excluding weekends) of emailing:



E-mail: olu.awosoga@uleth.ca (best way!)
 Phone: 403-332-4058
 Office: Markin Hall 3059 (3rd floor)
 Office Hours: 10:00 a.m. – 1:00 p.m. (Wed) or by appointment

LAB INSTRUCTOR:

Name: Jo-Anne Tomie
 E-mail: tomie@uleth.ca (best way!)
 Phone: 403-332-4415
 Office: Markin Hall 3070 (3rd floor)
 Office Hours: 12:00 noon – 2:30 p.m. (Wed) or by appointment

OVERALL GRADES:

The determination of final grades for all Health Sciences courses is as follows:

Letter		GPA	Percent	Letter		GPA	Percent
A+		4.0	95-100%	C+		2.3	71-74.9%
A	Excellent	4.0	91-94.9%	C	Satisfactory	2.0	67-70.9%
A-		3.7	87-90.9%	C-		1.7	63-66.9%
B+		3.3	83-86.9%	D+		1.3	59-62.9%
B	Good	3.0	79-82.9%	D	Poor	1.0	55-58.9%
B-		2.7	75-78.9%	F	Fail	0	0-54.9%

COURSE PROCESS:

It is generally well-accepted that we all learn better when our learning is **active**, and when we **learn in groups**. In addition, being able to perform effectively in groups is not only an essential skill required in most employment settings and careers, but learning how to work and relate well with others can be an important factor in our own mental, emotional and physical well-being. Therefore, this course will require that as well as working as an individual, you will be working in a small team designed to increase your learning in this course – and a proportion of your grade (30%) will be assigned for team work and participation. Please see the ‘assignments’ section for more information.

HOW TO SUCCEED IN THIS COURSE:



Everyone generally likes to do well in their courses, and as this course has some components that you may not be familiar with (e.g., statistics, team-based learning), you may find the following tips and pointers helpful for your success in this course:

- 1) Read the course outline, particularly the sections on assignment marking and grading.
- 2) Be sure to ask your instructor if there is anything you do not understand about the course.
- 3) Make sure you budget **at least** 4-5 hours a week for this course (above and beyond class time) – to allow you to do the course readings, and prepare for quizzes and/or assignments.
- 4) Be sure to fully participate both as an individual learner, and as an important team member. You will be depending on your team for your portion of the team/group work in this course – and they will be depending on you – so please strive to be an active member of your team.
- 5) Pay careful attention to the feedback (non-graded) you will be receiving on your group participation in this course roughly $\frac{1}{3}$ of the way through the course – it's the main way you'll find out how you need to improve on this aspects of the course, if need be.
- 6) If you find you would like to improve the marks on your quizzes, ask your team members and/or instructor for ways that you might improve your reading and/or study skills.

CREATING A POSITIVE LEARNING ENVIRONMENT:

You've all invested a lot of time and money in your education, and it's important that everyone helps to contribute to a learning environment that is as positive as possible. Therefore, all students will be expected to display (and encourage in each other) courtesy and respect during both the class and the labs. Therefore, please:

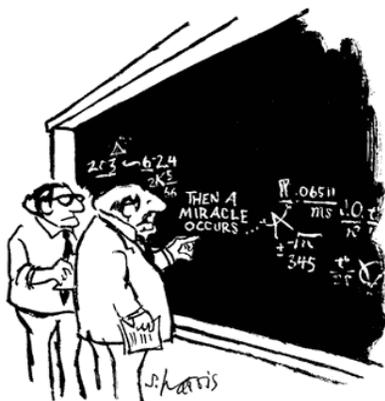
- Have shut off cell phones and beepers prior to class.
- Come to class on time, and stay the entire class, unless you have informed the instructor that you will be late or must leave early. If you miss a class for any reason, you are responsible for material covered, announcements made in class, materials distributed, etc.
- Stay focused on the class/discussion (e.g., please no checking emails, Facebook, etc. in class.)
- *Demonstrate respect to everyone by limiting side conversations during large group discussions and/or lectures (i.e., when we need to listen to what one person is saying). This is very important, and will be enforced, if need be, by the instructor(s) stopping class/lab and sitting down for as long as it takes to stop side-conversations, and/or having a discussion with you. If an instructor has to have more than one discussion with you about classroom respect, it may be grounds – in consultation with the Dean – for asking you to leave the class/lab/course.*




HLSC 3450: COURSE SCHEDULE (tentative):

Date	Topic(s)	Reading /Assignments for this Date
Lecture 1 (Jan. 9 th , 2013)	<ul style="list-style-type: none"> - Statistics: Fear and loathing – Or how to overcome fear and learn to love this course - Research problems, variables, research questions and hypotheses 	<ul style="list-style-type: none"> - Morgan: Chapter 1 - Kranzler (optional), Chapter 3 - PowerPoints for Lecture 1
Lecture 2 (Jan. 16 th , 2013)	<ul style="list-style-type: none"> - “Logic” behind research studies and data sets - Data coding and data entry - Review of data sets - Create mini-survey in class, code data in class, enter data, and checking data for errors - Quiz #1 (lectures 1 & 2 materials & course outline) 	<ul style="list-style-type: none"> - Morgan Chapter 2 - review Kranzler Chapter 3 - PowerPoints for Lecture 2
Lecture 3 (Jan. 23 rd , 2013)	<ul style="list-style-type: none"> - Sources and kinds of quantitative data: Levels of measurement - Frequency plots and distributions - Quiz #2 	<ul style="list-style-type: none"> - Morgan: Chapter 3 (pgs 37-42) - Morgan: Chapter 3 (36, 37, 42-45) - Kranzler: Chapter 4 - PowerPoints for Lecture 3
Lecture 4 (Jan. 30 th , 2013)	<ul style="list-style-type: none"> - Central tendency and variability - The normal curve - Quiz #3 	<ul style="list-style-type: none"> - Morgan, Chapter 3 (pgs 46-51) - Kranzler, Chapter 5 & 6 - PowerPoints for Lecture 4
Lecture 5 (Feb. 6 th , 2013)	<ul style="list-style-type: none"> - Introduction to selecting inferential tests - Review of selecting tests and examples - Quiz #4 	<ul style="list-style-type: none"> - Morgan, Chapter 6 (pgs 91-101, ignore General Linear model on pages 96-97) - Kranzler, Chapter 10 - PowerPoints for Lecture 5
Lecture *** (Feb.13 th , 2013)	<ul style="list-style-type: none"> - Interpretation of Confidence Intervals - Sampling Methods ** half-way team evaluations** ** must participate in this to receive marks ** No labs this week** 	<ul style="list-style-type: none"> - Morgan Chapter 6, pg 99 - Morgan Chapter 9, pgs 150, 152-153 - PowerPoints for Holiday week 6 Lecture
Lecture 6 (Feb. 27 th , 2013)	<ul style="list-style-type: none"> - Interpreting inferential statistics - Probability, statistical significance, research & null hypothesis, type I & II errors - Review of interpreting inferential stats & a brief introduction to Correlation using SPSS 	<ul style="list-style-type: none"> - Morgan, Chapter 6 (pgs 91 – 107) - Review Kranzler Chapter 10 - PowerPoints for Lecture 6

Date	Topic(s)	Reading /Assignments for this Date
Lecture 7 (March 6 th , 2013)	<ul style="list-style-type: none"> - Cross-tabulation, chi-square & non-parametric measures of association (Discuss Causation & Correlation) - Quiz #5 	<ul style="list-style-type: none"> - Morgan, chapter 7, pgs. 109-114, 116-120 - Kranzler chapter 13 - PowerPoints for Lecture 7
Mid-Term Test (March 13 th , 2013)	<p>** No class, but 1 hour Lab Exam Test (Midterm) **</p> <ul style="list-style-type: none"> - Lab #1 – write test on Wednesday, March 13th, 2013 @ 17:30 in AH-147 - Lab #2 – write test on Wednesday, March 13th, 2013 @ 19:00 in AH-147 	
Lecture 8 (March 20 th , 2013)	<ul style="list-style-type: none"> - Correlation & introduction to regression - Quiz #6 	<ul style="list-style-type: none"> - Morgan, Chapter 8, pgs. 123-134 - Kranzler Chapter 8 and Chapter 9 - PowerPoints for Lecture 8 & Midterm Review
Lecture 9 (March 27 th , 2013)	<ul style="list-style-type: none"> - Comparing groups: t-tests and similar nonparametric tests - Quiz #7 	<ul style="list-style-type: none"> - Morgan, Chapter 9, pgs 141-155 - Kranzler Chapter 11 - PowerPoints for Lecture 9
Lecture 10 (April 3 rd , 2012)	<ul style="list-style-type: none"> - Analysis of variance (ANOVA) - Quiz #8 	<ul style="list-style-type: none"> - Morgan Chapter 10, pgs 157-168 - Kranzler Chapter 12 - PowerPoints for Lecture 10
Lecture 11 (April 10 th , 2013)	<ul style="list-style-type: none"> - Use of Statistics in Health Care Research, Evidence-based Practice, Treatment Effectiveness and Assessment Accuracy 	<ul style="list-style-type: none"> - PowerPoint Slides for Lecture 11 - NO LAB - Morgan Chapter 8, pgs 141-143
Lecture 12 (April 17 th , 2013)	<ul style="list-style-type: none"> - Review of material to date & preparation for open book final exam - Mandatory final peer team evaluations -- Must complete peer evaluation to obtain grade for this section** 	<ul style="list-style-type: none"> - PowerPoints for Lecture 12 - Fill out your peer evaluations ready for submission
Final Exam (April 29 th , 2013)	<ul style="list-style-type: none"> - Final exam is booked for Saturday, April 27th, 2013 from 9:00 a.m. – 12:00 noon. - Location: AH 147 & AH 148 	<p>Please note that there will be <u>no</u> make-up exam (earlier or later)</p> <p>**Please <i>do not</i> book holiday travel plans before May 2nd, 2013</p>



"I think you should be more explicit here in step two."

ASSIGNMENTS:

1) Midterm: Lab Test on Dataset (20%) – **March 13th, 2013**

To get you going, you will be provided (in Week 2 lab) with a handout with data and variable names.

You will then create a SPSS data set, using the variable names you have been given, and enter the data (in pairs) into your newly created data set. Your data set will contain 5 nominal scale variables, 4 normal scale (continuous) variables, and approximately 45 cases.

In combination with your various course resources (e.g., Table 3.3 in your Morgan text):

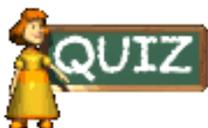
- 1) Produce 5 frequency tables for each of the 5 nominal variables, providing the appropriate SPSS output files.
- 2) Produce appropriate visual plots (visual aids) for each of the 9 variables.
- 3) Produce SPSS output files for all measures of central tendency and all measures of variability for each of the 4 normal (continuous) variables.
- 4) Review the following research questions, and then complete 5 – 6 (below)
 - a. What is the relationship between clients' gender and concurrent drug use?
 - b. What is the relationship between clients' age, and their confidence in quitting smoking?
 - c. What is the relationship between clients' age and their scores on the DSM-IV-R Global Assessment of Functioning (GAF) Scale*? (* Please refer to internet for more information on GAF scoring).
- 5) Using your resources (e.g., Figure 6.1 and pages 92-96 of Morgan), determine which statistical test is most appropriate for the above three questions (a, b & c). Make sure you understand your rationale for choosing the test utilized for each of the three questions.
- 6) Run the appropriate test for each question, and print off the SPSS output files for the three tests.
- 7) Write up some brief notes that describe how you would interpret the results of your analysis (steps 1 through 6), being sure to consider the following:
 - a. The clinical vs. the statistical significance of your results
 - b. Correlation vs. causation (if applicable)
 - c. The strength and direction of any relationships you find
 - d. Potential clinical implications arising from your analysis.
- 8) **Please bring all your tables, output files, visual plots and notes to the test** on March 13th, 2013. The midterm will be directly based on the results from your analysis above and few other general questions from class materials.

OPEN BOOK MID-TERM EXAM IS DURING LAB PERIOD, MARCH 13TH, 2013 – AH147

2) Open-Book Final Exam (30%) – **Saturday, April 29th, 9:00 a.m. – 12:00 Noon - AH147 & AH148**

For this examination, you will be given the "Smoking" data set with several additional variables. The open-book exam will build upon your experience with answering clinical research questions by using a dataset, choosing the appropriate statistical tests, running the tests, and interpreting the results. You will be allowed to bring in whatever resources you wish (textbooks, notes, lucky teddy bears, etc.), but you must complete the exam by yourself. The exam will be held in one of the on-campus computer labs, and the date and time will be announced as soon as the registrar is able to book the exam.

3) Individual Weekly Quizzes on Readings (25%) – **Start Lecture 2 (January 16th, 2013)**



To help you master the material for this course – and to help prepare you for productive and lively team work and discussions – there will be eight quizzes (approximately one each week). These quizzes – multiple choice and/or short answer – will be based on the daily readings in your course pack and the daily PowerPoint notes. The quizzes will not focus on ridiculously small details from your readings.

Instead, the quizzes will assess your ability to learn the main broad ideas and concepts presented each lecture in the course pack readings and PowerPoint notes. These short quizzes will be marked in class, so students get immediate feedback on their performance each lecture.

Although there are eight weekly quizzes, ***your final mark will only include the marks from your six highest quiz scores.*** If you miss a quiz for any reason (illness, dead battery in car, you missed your bus, your best friend's wedding, your cat's birthday, etc.), this missed quiz will not be included in your final mark. If students miss more than two quizzes, they will only be allowed to write a make-up quiz (scheduled with their instructor) if they provide written documentation from a health care provider (counselor, MD, nurse, etc.) attesting to the extenuating circumstances preventing them from writing the quiz. Otherwise, all additional missed quizzes will be graded as 0, and count as such towards your final grade.

In other words:

- If you write all 8 quizzes, only your 6 highest quiz scores count, and the lowest two are deleted
- If you write 7 quizzes (and miss 1), your lowest score is deleted
- If you only write 6 quizzes (and miss 2), none of your lowest scores will be deleted
- If you write 5 or fewer quizzes (i.e., miss 3 or more), only these will count, unless you provide documentation for your missed quizzes.

In addition to the **three individual assignments** (worth 75% of your overall mark), there are also two **assignments that are related to group work** (worth 25% of your overall mark) in this course. These assignments are:

4) Team Quizzes on Readings (15%) – **Start Lecture 2 (January 16th, 2013)**



These are exactly the same quizzes as the individual quizzes (above). However, these quizzes will be written and given credit as a team (one quiz per team), and are written immediately after the individual quiz. You will be allowed to discuss each question as a team, arrive at a consensus for each question – and then submit one quiz for your group. To instill some healthy competition ☺, the team scores for quizzes will be announced each lecture, but your individual quiz scores will remain confidential. As

with the individual quizzes, only the best **six out of eight** group quiz scores will count towards your group quiz score mark (the lowest two are deleted).

You will only receive a group quiz score for a quiz if you have participated in the quiz (i.e., you also wrote the individual quiz). As with individual quizzes, only your six highest quiz scores count, but if you miss 3 or more quizzes, you must provide a valid note (above) justifying your absence if you wish to receive a group quiz score for the quiz you missed.

5) Team Participation Peer Evaluations (10%) – Ongoing – **Due April 17th, 2013**



Relating and working well with others is incredibly important for our well-being, and it's therefore important to receive feedback on our work with others. You will have two formal evaluations on how your peers feel you are contributing to your team: one approximately half-way through the course (which does not contribute to your grade), and one at the end of the course (which will contribute to your final grade).

You will be peer-evaluated on several team-based performance criteria, including preparation, contribution, respect, flexibility, and group dedication. Your final team participation peer evaluation mark will consist of the average of your peer evaluations. For example, each of your team members will score you out of 50 for your team performance, so if you had 5 other team members, you will be given the average score out of 50 for the five peer evaluations. This average score out of 50 will then be transformed to a score out of 10, for your final team participation mark out of 10.

****Please be aware that if you do not participate in both the mid-term and final peer evaluations by submitting evaluations for your peers, you will receive a grade of “0” for this assignment (without a valid medical/psychological reason for not doing so)****

For more information on how you will be assessed, please carefully review the criteria for team participation peer evaluations towards the end of this course outline.

ACCOMMODATIONS FOR STUDENTS WITH A DISABILITY:

Reasonable accommodations are available for students who have a documented disability. If you have been diagnosed with a disability, there is no need to face the challenge of University without support. Please contact the Counselling Services/Students with Disabilities Resource Centre at 403-329-2766 <http://www.uleth.ca/ross/counselling/index.html> to set up an appointment. After registering with the Disabilities Resource Centre, your instructor will be notified by a formal letter of any accommodations you require. In addition, students are responsible for requesting accommodations from the instructor at least ***two weeks*** in advance of the evaluation date. The instructor and student are jointly responsible for arranging the resources needed for the evaluation process.

PLAGIARISM STATEMENT:

The University of Lethbridge subscribes to Turnitin.com, a plagiarism detection service. Please be advised that student work submitted for credit in this course may be submitted to this system to verify its originality. Students must be able to submit both electronic and hard copy versions of their work upon request.

COPYRIGHT STATEMENT:

All University of Lethbridge students, faculty and staff must comply with Canadian law and institutional license agreements pertaining to copyright. At the same time, keeping abreast of our copyright obligations and options is a complex task as copyright matters locally and globally are in flux and are likely to remain so for at least the near future.

The University's Copyright website (www.uleth.ca/copyright) is a source of current copyright information that includes:

- answers to common copyright questions (see the [FAQs](#)),
- guidance on whether you need permission or a license to copy a particular work (see the [Copyright Permissions Flow Chart](#)),
- guidance on assessing whether fair dealing may apply to specific instances of copying you wish to undertake (see the [Guidelines for Copying under Fair Dealing](#)), and
- a [permissions look-up tool](#) to help you determine the kinds of copying and other uses permitted by the Library's license agreements covering specific online journals and other online resources.

You are encouraged to contact the University Copyright Advisor (copyright@uleth.ca) for assistance with any copyright questions or issues.

Mid-Term Assessment of Overall Contributions of Team Members:**Team #** _____Names of Team Members: _____

Please use this form to evaluate your team work to date. Please hand in one of these completed forms per group to the instructor, indicating your team # above.

1. As a group, please list 2 or 3 ways in which the members of your team have helped your team to be successful, and if appropriate, identify the member(s) who might be particularly good at each one.

2. As a group, please identify what the members of your team could do that would help most to improve your team's performance.

3. If applicable, please identify a few things that the instructor could do better or differently to improve your team's performance, or the course in general.

Final Assessment of Overall Contributions of Team Members:

Your Team # _____ Your Name _____

Please rate your team members (all but yourself) from 1 to 10 to reflect how you really feel about the extent to which the other members of your team contributed to your team's learning and performance (**over the course of the whole semester**), using the following five team performance characteristics. This is your main opportunity to reward the members of your team who worked hard and helped make your team a positive and productive one. **Please note that if you give everyone pretty much the same score/rating, you may be penalizing those who worked the hardest, and rewarding those who did not work as hard.**

Preparation (Had they prepared & done readings prior to class?)

1-----2-----3-----4-----5-----6-----7-----8-----9-----10

Completely inadequate
preparation

Just adequate
preparation

Extremely well
prepared

Contribution (Did they contribute productively to group discussion and work?)

1-----2-----3-----4-----5-----6-----7-----8-----9-----10

Little or no
contributions

Contributes, but just
enough to get by

Exceptional
contributions

Respect (Did they show respect for other people, and encourage others' ideas?)

1-----2-----3-----4-----5-----6-----7-----8-----9-----10

Little or no
Respect

Generally
respectful of others

Extremely
respectful

Flexibility (Were they flexible and open-minded during disagreements?)

1-----2-----3-----4-----5-----6-----7-----8-----9-----10

Little or no
flexibility

Sufficiently
flexible

Exceedingly flexible
and open

Dedication (Punctuality, class attendance, communication with group during absences?)

1-----2-----3-----4-----5-----6-----7-----8-----9-----10

Little or no
Dedication

Acceptable
dedication to team

Excellent dedication
to team

1) Team Member's Name: _____

a) Preparation:

b) Contribution:

c) Respect:

d) Flexibility:

e) Dedication:

2) Team Member's Name: _____

a) Preparation:

b) Contribution:

c) Respect:

d) Flexibility:

e) Dedication:

3) Team Member's Name: _____

a) Preparation:

b) Contribution:

c) Respect:

d) Flexibility:

e) Dedication:

4) Team Member's Name: _____

a) Preparation:

b) Contribution:

c) Respect:

d) Flexibility:

e) Dedication:

5) Team Member's Name: _____

a) Preparation:

b) Contribution:

c) Respect:

d) Flexibility:

e) Dedication:

6) Team Member's Name: _____

a) Preparation:

b) Contribution:

c) Respect:

d) Flexibility:

e) Dedication:
