YukonCollege

COURSE OUTLINE

MATH 105

INTRODUCTORY STATISTICS

60 HOURS
3 CREDITS

PREPARED BY: Kyle Gasper, Instructor   DATE: December 6, 2016

APPROVED BY: Andrew Richardson   DATE:

APPROVED BY ACADEMIC COUNCIL: (date)

RENEWED BY ACADEMIC COUNCIL: (date)

INTRODUCTORY STATISTICS

INSTRUCTOR: Kyle Gasper

OFFICE HOURS: Immediately after lecture/tutorial or by appointment

OFFICE LOCATION: N/A

CLASSROOM: A2204 (Lecture & Tutorial)

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TELEPHONE: (867) 668-8770 (Admin Ast.)

DATES: Jan 5th to April 21st, 2017

LECTURE: Tues/Thurs 5:30-7:00pm

TUTORIAL: Tues 7:00-8:00pm

COURSE DESCRIPTION

This is a first course in Statistics. The objective of the course is for students to gain a good intuitive understanding of statistical principles and methods. At the end of the course, students should be able to use elementary statistical techniques and to critically assess statistical work done by others. Topics include descriptive statistics (histograms, mean, median, mode, standard deviation, normal approximations, and measurement errors) correlation and regression, probability, chance, variability, sampling, and hypothesis testing (including one-sample, two-sample, ANOVA, and chi-squared). The course is not intended to be a mathematical treatment of statistics, but a good knowledge of high school algebra is critical.

PREREQUISITES

MATH 11, MATH 12, or MATH 130 is strongly recommended.

EQUIVALENCY OR TRANSFERABILITY

AU MATH 215 (3)   CAMO STAT 116 (4)   KPU MATH 1115 (3)

OC STAT 121 (3)   SFU STAT 101 (3) -Q   TRU STAT 1200 (3)
TRU-OL STAT 1201 (3)   TWU MATH 102 (3)
UBC STAT 203 (3). Not for credit in the faculty of Science.

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UBCO STAT 121 (3)   UFV MATH 1XX (3)
UNBC STAT 240 (3) Refer to transfer notes
UVIC STAT 100 lev (1.5)   UVIC MATH 161 (3)

LEARNING OUTCOMES

Upon successful completion of the course, students will be able to:

- Apply the techniques of descriptive statistics in order to organize and analyse data (using histogram, mean, median, mode, and standard deviation).
- Demonstrate an understanding of probability (simple/addition/multiplication/conditional) and counting rules (combinations and permutations).
- Apply hypothesis tests to means, proportions, and variances.
- Demonstrate an understanding of ANOVA and nonparametric statistics.
- Apply the techniques of inferential statistics (correlation and regression).
- Present the findings of a research project that employs the statistical techniques learned throughout the course to a real-world, local dataset.

COURSE FORMAT

The course consists of 3 hours of lecture and 1 hour of tutorial per week. The Tuesday tutorial sessions will give students the chance to work in small groups, with the instructor present, on Microsoft Excel, practice problems, assignments, and their research projects. Active participation in the tutorial sessions is important for success in the course. Some tutorial sessions will involve practice using Microsoft Excel for the assignments and research project.

ASSESSMENTS

Assignments

There are eight assignments in the course. They are due approximately one per week and are worth a combined total of 20% of the final course grade. An assignment handout listing all of the assigned questions and the due dates will be distributed on the first day of class.

Projects

Students will undertake a research project where they will apply the statistical techniques learned in the course to a real-life situation involving data analysis. The project will involve both an oral and written component (i.e. Excel, Report, and PowerPoint/Poster). More information on the project will be presented during the

first week of class. The research project is due on March 28th and is worth 30% of the final course grade.

Tests

There will be one mid-term test given during class, on Tuesday February 14, 2017. If your final exam mark exceeds your midterm exam mark, then only the final exam mark will be counted.

A comprehensive final examination will be held at the end of the term, within the period of April 10 – April 21, 2017. The examination date will be announced as soon as it is confirmed by the School of Liberal Arts.

EVALUATION

Assignments	20%
Midterm Exam	20%
Research Project	30%
Final Exam	30%
Total	100%

REQUIRED TEXTBOOKS AND MATERIALS

Textbook

OpenIntro Statistics (third edition): this is a free textbook, available for pdf download (with chapter headings) at https://www.openintro.org/stat/textbook.php. You may also purchase inexpensive hardcopies through the above website or amazon.ca.

The student can click on links within the textbook to immediately access video explanations of key concepts. Readings are short and succinct.

Supporting materials

There are many videos available free online to help students with understanding major course concepts. It is not a course requirement to watch these videos: these are only listed here to help students find additional explanations of key concepts. Note that the textbook includes links to its own videos to help explain these concepts. However, two additional video series the student may find helpful are listed below:

1. Khan Academy: https://www.khanacademy.org/math/statistics-probability
2. Math is Fun: https://www.mathsisfun.com/data/

Refresher for high school algebra

As mentioned above, knowledge of basic high school algebra (not calculus or linear algebra) will be important for understanding statistical concepts and completing some of the assignment questions.

For students seeking to refresh their algebra knowledge before taking this course, one good resource is Khan Academy's videos on algebra. These are 7 minute videos, easy to follow, and used by students all over the world. Some students may find them entertaining:
https://www.khanacademy.org/math/algebra#table-of-contents

After clicking on this link, you will see a list of videos organized into 18 topics. Try watching any videos with titles that sound unfamiliar to you. It is not a course prerequisite or requirement to watch these videos.

If the student prefers to read about algebra, this site is also very helpful:
http://tutorial.math.lamar.edu/Classes/Alg/Alg.aspx

ACADEMIC AND STUDENT CONDUCT

Information on academic standing and student rights and responsibilities can be found in the current Academic Regulations that are posted on the Student Services/ Admissions & Registration web page.

PLAGIARISM

Plagiarism is a serious academic offence. Plagiarism occurs when students present the words of someone else as their own. Plagiarism can be the deliberate use of a whole piece of another person's writing, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken material. Whenever the words, research or ideas of others are directly quoted or paraphrased, they must be documented according to an accepted manuscript style (e.g., APA, CSE, MLA, etc.). Resubmitting a paper which has previously received credit is also considered plagiarism. Students who plagiarize material for assignments will receive a mark of zero (F) on the assignment and may fail the course. Plagiarism may also result in dismissal from a program of study or the College.

YUKON FIRST NATIONS CORE COMPETENCY

Yukon College recognizes that a greater understanding and awareness of Yukon

First Nations history, culture and journey towards self-determination will help to build positive relationships among all Yukon citizens. As a result, to graduate from ANY Yukon College program, you will be required to achieve core competency in knowledge of Yukon First Nations. For details, please see www.yukoncollege.yk.ca/yfnccr.

ACADEMIC ACCOMMODATION

Reasonable accommodations are available for students requiring an academic accommodation to fully participate in this class. These accommodations are available for students with a documented disability, chronic condition or any other grounds specified in section 8.0 of the Yukon College Academic Regulations (available on the Yukon College website). It is the student's responsibility to seek these accommodations. If a student requires an academic accommodation, he/she should contact the Learning Assistance Centre (LAC) at (867) 668-8785 or lassist@yukoncollege.yk.ca.

TOPIC OUTLINE

Please note: we will try to follow this outline as closely as possible, but may deviate from the schedule where it is necessary to give more time to a particular concept.

Week	Topic	Assignment
1: Jan 5	Class Intro & Descriptive Statistics	None due
2:Jan 10/12	Descriptive Statistics / Probability	None due
3:Jan 17/19	Probability / Distributions	Assign. 1 due Jan 17 (Descriptive Stats)
4: Jan 24/26	Distributions / Inferential Statistics	Assign. 2 due Jan 24 (Probability)
5: Jan 31/2	Inferential Statistics / Quantitative Inferences	Assign. 3 due Jan 31 (Distributions)
6: Feb 7/9	Quantitative Inferences / Mid-term review	Assign. 4 due Feb 7 (Inferential Stats)
7: Feb 14/16	MID-TERM (Feb 14) Qualitative Inferences	Assign. 5 due Feb 16 (Quant Inferences)
8: Feb 21/23	READING WEEK (no classes)	None due
9: Feb 28/2	Qualitative Inferences Correlation and Regression	None due
10: Mar 7/9	Correlation and Regression Multiple Regression	Assign. 6 due Mar 7 (Qual Inferences)
11: Mar 14/16	Multiple Regression Special topics	Assign. 7 due Mar 14 (Correl. & Regression)
12: Mar 21/23	Special topics	Assign. 8 due Mar 21

	Special topics	(Multiple Regression)
13: Mar 28/30	Class presentations	RESEARCH PROJECT DUE March 28
	Class presentations	
14: Apr 4/6	Class presentations & Exam Review	None due
	Exam Review	

Other readings and materials may be assigned or advised. A detailed syllabus is provided in class and is found on the course site.