YukonCollege

COURSE OUTLINE

MATH 105
INTRODUCTORY STATISTICS

60 HOURS
3 CREDITS

PREPARED BY: Jaclyn Semple, Instructor   DATE: November 9, 2017

APPROVED BY: DATE:

APPROVED BY ACADEMIC COUNCIL: (date)

RENEWED BY ACADEMIC COUNCIL: (date)

Introductory Statistics

INSTRUCTOR: Jaclyn Semple

OFFICE LOCATION: A2433

E-MAIL: jsemple@yukoncollege.yk.ca

TELEPHONE: 867-456-8548

OFFICE HOURS: Tue & Thu, 10-11am

CLASSROOM: TBD

TIME: Class: Mon/Wed 10:30am – 12pm
Tutorial: Fri 10:30am – 11am

DATES: January 3 – April 25, 2018

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

For more information about transferability contact the School of Liberal Arts office.
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

Lectures: 3 hours per week
Tutorial: 1 hour per week

The course content is covered through lectures, tutorials, and assignments. Students are expected to prepare for each class by doing assigned readings from the textbook and are also expected to engage in substantial self-directed review and practice of the material. Students are expected to read the material before class, as this course is fast-paced and will be difficult to follow for those who have not come prepared.

Most students find the course demanding. You should plan on spending between two and four hours in study and preparation outside class for each hour spent in class.

ASSESSMENTS

Assignments
Problems (not graded by the instructor) will be assigned each week and solutions will be available on the course Moodle page or in the textbook.

Quizzes (20%)
There will be *around* ten quizzes during the term, worth 20% of the final mark. Most questions on the quizzes will be drawn from the assigned problems. Thus, completing the assignments should guarantee good quiz results. Missed quizzes cannot be made up unless prior arrangements have been made with the instructor. However, the lowest quiz result will be discarded.

Research Project (30%)
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 (ie. Excel, report,

presentation). The final product will be due during the last week of class, and smaller components of the project will be due at various points throughout the term. More information on the project will be presented in the first few weeks of class.

Midterm Test (20%)
There will be one midterm test worth 20% of the final mark.

Final Examination (30%)
The final examination will cover the entire course and is worth 30% of the final mark. It will be held at the end of the term sometime during the exam period. The exact date of the exam will be announced as soon as it is set by the School of Liberal Arts.

EVALUATION
The student's grade will be calculated as follows:

Quizzes	20%
Midterm Test	20%
Research Project	30%
Final Examination	30%
Total	100%

REQUIRED TEXTBOOKS AND MATERIALS

Textbook: Triola/Goodman/Law/Labute. *Elementary Statistics*. 3rd Canadian Edition. Pearson Canada, 2011. ISBN: 9780321225979

Supporting Materials: In addition to the textbook, some students may find it helpful to supplement their reading with free online resources. Excellent online resources include:

Introductory Statistics, OpenStax
www.openstax.org/details/introductory-statistics
This is a free textbook, available online in PDF or web view format.

Khan Academy: Probability and Statistics
https://www.khanacademy.org/math/probability
Use it for: Short YouTube videos explaining each concept.

Math is Fun: Probability and Statistics
http://www.mathsisfun.com/data/#stats
Use it for: Clear step-by-step explanations of each concept.

Calculator: You will require a scientific calculator for this course. It need not be a graphing calculator, but it should have a stats function and be capable of square roots, powers, exponents, and factorials.

ACADEMIC AND STUDENT CONDUCT

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

OUTLINE OF TOPICS

Week	Content
1	**Introduction to Statistics:** Statistical Thinking, Types of Data, Sampling **Summarizing & Graphing Data:** Frequency Distributions, Histograms, etc.
2	**Descriptive Statistics:** Measures of Centre, Variation, Relative Standing
3	**Probability:** Addition/Multiplication Rules, Conditional Probability, Counting
4	**Discrete Probability Distributions:** Random Variables, Binomial Distribution
5	**The Normal Distribution:** z-Scores, Applications, Central Limit Theorem
6	**Confidence Intervals:** Estimating Population Mean/Proportion/Standard Deviation
7	Review **Midterm**
8	*Reading Week*
9	**Hypothesis Testing:** Testing a Claim about a Mean/Proportion/Standard Deviation
10	**Hypothesis Testing – Two Samples:** Two Means/Proportions/Standard Deviations
11	**Correlation & Regression:** Correlation Coefficient, Prediction Intervals, Variation
12	**Goodness-of-Fit, Independence, Homogeneity:** Chi-Square revisited, Contingency Tables
13	**Analysis of Variance:** F-Distribution revisited, One-Way ANOVA
14	Research Project Presentations
14.5	Exam Review