

STAT 151A – Introduction to Applied Statistics

3 credits, 3 hours lecture, 2 hours lab (Every Other Week), 2 Hour tutorial.

An introduction to descriptive statistics (including histograms, stem-and-leaf plots, and box plots), elementary probability, the binomial distribution, the normal distribution, sampling distributions and the central limit theory. An introduction to inferential statistics including estimation of population parameters and confidence intervals for means, hypothesis testing including both one and two sample tests, paired comparisons, one-way analysis of variance (ANOVA), chi-square test, correlation and linear regression analysis. Statistical analysis with an IBM software, Statistical Package for the Social Sciences (SPSS).

Prerequisites and/or co-requisites: Math30-1 or Math30-2

Instructor

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Office hours

Monday 12:00 - 12:50
Wednesday 13:00 - 14:50
Friday 12:00 - 13:50

Hours of Instruction

Monday 14:00 – 14:50, Room S210
Tuesday 10:30 – 12:20, Room S210
Thursday 15:00 – 16:50, Room S107 (Labs/Tutorials)

Required Resources

Introductory Statistics: Exploring the World Through Data, Canadian Edition, ISBN 9780134213170, Gould, R., Ryan, C., Stallard, J., and Boué, M. (2018).

Course Outcomes

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

- employ descriptive statistics including computation of the mean, median, mode, variance and standard deviation of a given data set as well as construction of histograms, stem-and-leaf plots, and box plots.
- determine the probability of any given event based on possible occurrences.
- apply the discrete and continuous probability distributions including the binomial distribution, the normal distribution, sampling distributions and the central limit theory.

- employ inferential statistics encompassing hypothesis testing, ANOVA, chi-square test, correlation and linear regression analysis.
- conduct statistical analysis using SPSS.

Evaluation

Item	Percentage Allotted
Assignments	10%
Tutorials	5%
Labs	15%
Midterm Exam 1	15%
Midterm Exam 2	15%
Final Exam	40%
TOTAL	100%

A grade of C- is required for progression or transfer.

Assignments

Assignments are conducted online and as such access to MyLab Statistics is mandatory. Students receive access codes to this application with the purchase of the course textbook from Keyano College bookstore. If you decide to purchase a course textbook from elsewhere, then ensure that you get an access code for MyLab Statistics from Keyano College bookstore. Your instructor will go over the instructions during the first lecture. Assignments must be completed via the MyLab Statistics web site before the posted due dates. As well this access is required for tutorials and other tests. The assignments cover chapters learned in class.

You will be allowed to rework assignments after the due date but only for practice purposes; this will have no effect on your score. Missed or incomplete assignments may result in a grade of F for the course. It is advisable to start working on assignments right away without postponing till the deadline.

Tutorials

Just like the assignments tutorials are conducted online via MyLab Statistics. Tutorials which will be conducted every other week are designed to provide additional practice and help you develop your problem solving skills by working out completely selected online problems under the guidance of your instructor. Tutorials are due at the end of the tutorial period, unless otherwise indicated. You are expected to work on tutorial problems by yourself, though you may discuss your work with your instructor or a classmate; collaborative solutions are not allowed unless explicitly stated by your instructor.

Labs

In the real world, most statistical analyses are conducted using computer software. This is one of the industry standards for analyzing statistics and as such we will be employing SPSS in this course. There are five labs that are designed to introduce students to the main features of data organization and analyses (both descriptive and inferential). The labs serve to demonstrate how data analyses covered in

the course can be conducted with the statistical software. Labs are conducted every fortnight sequence. In the first week of the lab sequence, students are introduced to the relevant analyses and given the opportunity to ask the instructor questions. All labs must be completed before the posted due date.

Midterm Exams (1 & 2)

There will be two midterm exams. First midterm exam will be online via MyLab Statistics and will cover Chapters 1-5. The structure of the first midterm will be a hybrid of multiple choice and direct answer questions. The second midterm exam will be closed book, paper-based, hand-written and will cover chapters 6-10. The structure of the second midterm will be a series of long questions. Both exams provide students with a variety of statistical problems related to the material covered in the lectures. Marks will be based on accurate statistical analyses and on the interpretation of the results of the statistical analyses. Students need to bring a calculator, pencils, and an eraser.

Final Exam

The final exam will be closed book, paper-based, hand-written and will cover the entire semester, i.e., Chapters 1-12. The structure of the final exam will be similar to those of the midterm exams. This will comprise of a batch of multiple choice and a series of long questions to be completed. Marks will be based on accurate statistical analyses and on the interpretation of the results of the statistical analyses. Students need to bring a calculator, pencils, and an eraser.

Grading System

Descriptor	Alpha Grade	4.0 Scale	Percent	Rubric for Letter Grades
Excellent	A+	4.0	> 92.9	Work shows in-depth and critical analysis, well developed ideas, creativity, excellent writing, clarity and proper format.
	A	4.0	85 – 92.9	
	A-	3.7	80 – 84.9	
Good	B+	3.3	77 – 79.9	Work is generally of high quality, well developed, well written, has clarity, and uses proper format.
	B	3.0	74 – 76.9	
	B-	2.7	70 – 73.9	
Satisfactory Progression	C+	2.3	67 – 69.9	Work has some developed ideas but needs more attention to clarity, style and formatting.
	C	2.0	64 – 66.9	
	C-	1.7	60 – 63.9	
Poor	D+	1.3	55 – 59.9	Work is completed in a general way with minimal support, or is poorly written or did not use proper format.
Minimum Pass	D	1.0	50 – 54.9	
Failure	F	0.0	< 50	Responses fail to demonstrate appropriate understanding or are fundamentally incomplete.

Proposed Schedule of Topics

Week	Main Topic	Chapter	Assignments/Lab/Tutorial
1	Introduction to data & Visualizing Data	1, 2	Assignment#1 Tutorial#1
2	Numerical Summaries of Centre and Variation	3	Assignment#2 Lab#1 - Displaying and Describing Distributions
3	Regression Analysis: Exploring Relationships between Variables	4	Assignment#3 Tutorial#2
4	Modelling Variation with Probability	5	Assignment#4 Lab#2 - Linear Regression and Correlation
5	Midterm Exam 1 Online under MyStat Lab	1-5	
6	Modeling Random Events: The Normal and Binomial Models	6	Assignment#5 Tutorial#3
7	Survey Sampling and Inference: CLT for proportions and means (Include Sections 9.1-9.2)	7, 9	Assignment#6 Lab#3 - Inferences for One-Sample
8	Hypothesis Testing for Population Proportions	8	Assignment#7 Tutorial#4
9	Inferring Population Means	9	Assignment#8 Lab#4 - Inferences for Two-Sample
10	Relationships between Categorical Variables	10	Assignment#9 Tutorial#5
11	Midterm Exam 2 Written Exam	6-10	
12	Comparing Several means: One-Way Analysis of Variance	11	Assignment#10 Lab#5 - One-way Analysis of Variance
13	Design of Experiments and Sampling	12	Assignment#11 Tutorial#6
14	Review	1-12	
15	Final Exam Written Exam	1-12	

Please Note:

Date and time allotted to each topic is subject to change.

Performance Requirements

Student Responsibilities

It is your responsibility as a student to contact the Office of the Registrar to complete the forms for Withdrawal or Change of Registration, and any other forms. Please refer to the list of important dates as noted in the Academic Schedule in the Keyano College credit calendar.

More specific details are found in the Student Rights and Student Code of Conduct section of the Keyano College credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Student Code of Conduct Policies.

Laboratory Safety

In the science laboratories, safety is important and therefore students must complete the *WHMIS for Students* online training course on Moodle before entering the science laboratories.

Students must comply with the mandatory laboratory safety rules for this course as provided in the laboratory manual. Failure to do so will result in progressive discipline such as a verbal warning, refused entry into the laboratory, or suspension from the College.

Before entering the lab, students are responsible reviewing the lab manual and relevant Safety Data Sheets for the purpose of evaluating risks associated to health. Some hazards used in the laboratory may have additional risks to those with pre-existing medical conditions.

Student Attendance

Class attendance is useful for two reasons. First, class attendance maximizes a students' learning experience. Second, attending class is a good way to keep informed of matters relating to the administration of the course (e.g., the timing of assignments and exams). Ultimately, you are responsible for your own learning and performance in this course.

It is the responsibility of each student to be prepared for all classes. Students who miss classes are responsible for the material covered in those classes and for ensuring that they are prepared for the next class, including the completion of any assignments and / or notes that may be due.

Academic Misconduct

Students are considered to be responsible adults and should adhere to principles of intellectual integrity. Intellectual dishonesty may take many forms, such as:

- Plagiarism or the submission of another person's work as one's own
- The use of unauthorized aids in assignments or examinations (cheating)
- Collusion or the unauthorized collaboration with others in preparing work
- The deliberate misrepresentation of qualifications
- The willful distortion of results or data
- Substitution in an examination by another person
- Handing in the same unchanged work as submitted for another assignment
- Breach of confidentiality.

The consequences for academic misconduct range from a verbal reprimand to expulsion from the College. More specific descriptions and details are found in the Student Rights and Student Code of Conduct section of the Keyano College credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Student Code of Conduct Policies.

In order to ensure your understanding of the concept of plagiarism, you must successfully complete the online tutorial found on ilearn.keyano.ca. Then print the certificate, sign it, and show it to each of your instructors. Your course work will not be graded until you show this signed certificate.

Specialized Supports

The Student Academic Support Services (SASS) department: Accessibility Services, Skill Centre and Wellness Services, work together to support student success at Keyano College.

Accessibility Services (CC167) supports student success through group and individualized instruction of learning, study and test taking strategies, and adaptive technologies. Students with documented disabilities, or who suspect a disability, can meet with the Learning Strategists to discuss accommodation of the learning barriers that they may be experiencing. Students who have accessed accommodations in the past are encouraged to visit our office at their earliest opportunity to discuss the availability of accommodations in their current courses. Individual appointments can be made by calling 780-791-8934

Skill Centre (CC119) provides a learning space where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff. Students visiting the centre have access to one-to-one or group tutoring, facilitated study groups, and assistance in academic writing. The Skill Centre's Peer Tutor program provides paid employment opportunities for students who have demonstrated academic success and want to share what they have learned. Tutoring is available free to any students registered at Keyano College on a drop in basis, from 9:00 am to 5:00 pm Monday through Friday. Additional evening hours are subject to tutor availability and are posted in the Skill Centre.

Wellness Services (CC260) offers a caring, inclusive, and respectful environment where students can access free group and individual support to meet academic and life challenges. Mental Health Coordinators offer a safe and confidential environment to seek help with personal concerns. The Mindfulness Room in CC260 is available as a quiet space for students to relax during regular office hours. Wellness Service welcomes students to participate in any of the group sessions offered throughout the academic year addressing such topics as Mindfulness and Test Anxiety. Individual appointments can be made by calling 780-791-8934.

Please watch your Keyano email for workshop announcements from our Student Academic Support Services team.