

Stats 151 – Introduction to applied statistics

3 credits, 16 weeks, 5 hours

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, chi-square test, correlation and linear regression analysis.

Prerequisites and/or co-requisites
Math 30-1 or Math 30-2

Instructor

Louis Dingley
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Office Hours

Monday 2:00pm – 3:00pm
Wednesday 10:00am – 12:00pm
Thursday 10:00am – 12:00pm

Hours of InstructionLecture

Monday	3:00pm – 3:50pm	Room CC228
Wednesday	2:00pm – 3:50pm	Room CC228

Lab X

Thursday	1:00pm – 2:50pm	Room S105
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Lab Y

Friday	2:00pm – 3:50pm	Room S105
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Required Resources

Agresti, A. and Franklin, C. (2012). *The art and science of learning from data*, 3rd ed. New York: Freeman. ISBN 978-0-321-75594-0

Course Outcomes

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

- apply descriptive and inferential statistics.
- competently use statistical computer software.

Evaluation

Item	Percent	Due Date
Lab assignments	10%	See Lab Assignments below
Midterm exams (total of 3)	40% total	Wednesday, September 23 (13%) Wednesday, October 21 (13%) Wednesday, November 18 (14%)
Final lab examination	10%	November 26 and 27
Final course examination	40%	Week of December 7 to 11, 2015
<i>Total</i>	<i>100%</i>	

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

Lab Assignments

In the real world, most statistical analyses are conducted using computer software. In this course we will be using one of the industry standards for analyzing statistics: IBM SPSS (Statistical Package for the Social Sciences). Five labs are designed to introduce students to the main features of data organization and analyses (both descriptive and inferential). The labs provide statistical problems related to the material covered in the course lectures and will serve the purpose of reinforcing this learning as well as demonstrating how the analyses can be conducted with the statistical software. Labs run on two-week cycles. In the first week of the lab cycle, students are introduced to the relevant analyses. The second week of the cycle provides students with the opportunity to complete the lab with the instructor available to answer questions. All labs are due at the end of the second lab period for that lab.

Lab	Topic	Lab Dates
1	Displaying and Describing Distributions	September 10, 11 and 17, 18
2	Linear Regression and Correlation	September 24, 25 and October 1, 2
3	Inferences for one-sample problems	October 8, 9 and 15, 16
4	Inferences for two-sample problems	October 22, 23 and 29, 30
5	One-way Analysis of Variance	November 5, 6 and 19, 20
	Lab Exam	November 26, 27

Term Exams

The three term exams provide students with a variety of statistical problems related to the material covered in Chapters 1 through 10. Marks will be based on accurate statistical analyses and on the interpretation of the results of the statistical analyses. Students will be provided with the necessary Statistical Tables (such as the Z Table) and relevant statistical formulae. Students need to bring a calculator, pencils, and an eraser.

Lab Exam

In the second last week of the course students will write a lab exam in their lab periods. The lab exam will be of similar format to the lab assignments, whereby students will be provided with a data set and a series of questions to answer. Statistical analyses will be conducted using SPSS and the lab exam (written in Microsoft Word) will be submitted by the end of the lab period. Students need to be able to apply all data management and statistical analyses they learned during the lab section of the course.

Final Exam

The final exam will be given in the examination week (December 7 through 11). The final exam will be of similar format to the midterms and consist of a series of statistical problems to be solved. Marks will be based on accurate statistical analyses and on the interpretation of the results of the statistical analyses. The final exam is comprehensive covering material from the entire semester. Students will be provided with the necessary Statistical Tables (such as the Z Table) and relevant statistical formulae. 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.

Schedule of Topics**Part I: Gathering and Exploring Data**

Statistics: The art and science of learning from data	Chapter 1
Exploring Data with Graphs and numerical summaries	Chapter 2
Gathering Data	Chapter 4
Association: Contingency, Correlation, and Regression	Chapter 3

Part II: Probability, Probability Distributions, and Sampling Distributions

Probability in our daily lives	Chapter 5
Probability distributions	Chapter 6
Sampling distributions	Chapter 7

Part III: Inferential Statistics

Confidence Intervals	Chapter 8
Tests of Significance	Chapter 9
Comparing two groups	Chapter 10

Part IV: Analyzing Associations and Extended Statistical Methods

Analyzing associations between categorical variables	Chapter 11
Comparing Groups: Analysis of Variance	Chapter 14
Review	

Please Note:

This course outline may be modified to facilitate unforeseen time constraints. Date and time allotted to each topic is subject to change. 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.

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 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 and laboratories.

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.

Students that miss two or more laboratory sessions automatically fail the course. This is irrespective of cause for missing the laboratory sessions.

Attendance will be taken each class and laboratory session in accord with department policy. This will be accomplished by sign-in sheets distributed at the beginning of class/lab. Each student must enter their own information on the sign-in sheet. Failure to record your information on the sign-in sheets will be recorded as an absence.

Assignments and exams

It is the student's responsibility to make sure they know when assignments are due, and when exams take place. Major exam dates are listed in this course outline. Assignments will be announced in class/lab and related information will be posted on Moodle.

You will have at least 1 week to complete assignments. Assignments are automatically late if not handed in when asked for at the start of class. Late assignments will be penalized 20% per day late and will not be accepted if more than 5 days late.

The lecture and lab final exams are cumulative and must be written to complete the course.

Travel plans are NOT valid excuses for missing exams.

Do not make plans to travel during the final lecture exam period. Exams missed under these circumstances will not be accommodated and therefore completion of the course is not possible.

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 2015-2016 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 at <https://www.indiana.edu/~istd/>. 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

Counselling and Disability Services

Counselling Services provides a wide range of specialized counselling services to prospective and registered students, including personal, career and academic counselling.

SKILL Centre

The SKILL Centre is a learning space in the Clearwater Campus at Keyano College where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff.

The SKILL Centre, through a variety of delivery methods, provides assistance in skill development to Keyano students. Assistance is provided by instructors, staff and student tutors. Individuals wishing to improve their mathematics, writing, grammar, study, or other skills, can take advantage of this unique service.

Authorization

This course outline has been reviewed and approved by the Program Chair.

Louis Dingley, Instructor

Louis Dingley, Chair

Date Authorized

Guy Harmer, Dean

Date Authorized

Signed copies to be delivered to:

Instructor

Registrar's Office