

Youngstown State University
Department of Mathematics and Statistics
Course Outline for Statistics 2625

Course Title: Statistical Literacy and Critical Reasoning

Course Credit: 4 s.h.

Text: “*Elementary Statistics: A Brief Version*,” by Allan Bluman, 7th Edition, 2015. Publisher: McGraw-Hill

Course Prereq: Math 1501 or at least Level 20 on the Mathematics Placement Test.

Course Description: An introduction to statistics and its applications. Topics include descriptive statistics, experimental design, probability, sampling distribution, statistical inference, correlation and regression. Emphases are on applications, critical reasoning, and data analysis using statistical software.

Course Objectives: STAT 2625 is a General Education course. STAT 2625 satisfies General Education goal 5 and integrates goals 1, 2, and 3 wherever possible. These general education goals are:

- To write and speak effectively.
- To process and present both quantitative and qualitative information using technology.
- To reason critically both individually and collaboratively.
- Comprehend mathematical concepts in both applied and abstract contexts.

Course Assignments:

<u>Chapter</u>	<u>Sections</u>	<u>Contents</u>
1	1.1 - 1.5	The Nature of Probability and Statistics
2	2.1 - 2.4	Frequency Distributions and Graphs
3	3.1 - 3.4	Data Description
4	4.1 - 4.5	Probability and Counting Rules
5	5.1 - 5.3	Discrete Probability Distributions
6	6.1 - 6.3	The Normal Distribution
7	7.1 - 7.3	Confidence Intervals and Sample Size
8	8.1 - 8.4	Hypothesis Testing
9	9.1 - 9.3	Testing the Difference between Two Means
10	10.1 - 10.2	Correlation and Regression
11	11.1 - 11.2	Chi-Square and Analysis of Variance (ANOVA)

Optional Sections: 6.4, 8.6, 9.1, 9.2, 10.3, 11.3

This course will include the use of computer software such SPSS, R, or EXCEL, and MS-WORD determined by the instructor. A data analysis term paper is required as part of the course grade.

Learning Outcomes:

1. Summarize univariate and bivariate data by employing appropriate graphical, tabular, and numerical methods and describe the attributes of or relationships between the data. These may include (but are not limited to): frequency distributions; box plots; scatter plots; correlation coefficients; regression analysis; and measures of center, variation, and relative position.
2. Identify the characteristics of a well-designed statistical study and be able to critically evaluate various aspects of a study. Recognize the limitations of observational studies and common sources of bias in surveys and experiments. Recognize that association is not causation.
3. Compute the probability of compound events, independent events, and disjoint events, as well as conditional probability. Compute probabilities using discrete and continuous distributions, especially applications of the normal distribution.
4. Explain the difference between statistics and parameters, describe sampling distributions, and generate sampling distributions to observe the Central Limit Theorem.
5. Estimate population parameters using point and interval estimates and interpret the interval in the context of the problem. Summarize the relationship between the confidence level, margin of error, and sample size.
6. Given a research question, formulate null and alternative hypotheses. Describe the logic and framework of the inference of hypothesis testing. Make decision using p-value and draw appropriate conclusion. Interpret statistical significance and recognize that statistical significance does not necessarily imply practical significance. Perform hypothesis testing with at least one test related to quantitative variable (e.g. t-test for mean, test for linear correlation) and at least one test related to qualitative variable (e.g., test for one population proportion and chi-square test for independence).
7. For a complete list of learning outcomes, see [TMM 010 - Introductory Statistics](https://www.ohiohighered.org/transfer/transferringmodule/learningoutcomes) in <https://www.ohiohighered.org/transfer/transferringmodule/learningoutcomes>

Note: Theft or misuse of information technology (including the downloading of pornography or visiting pornographic websites) is a violation of “The Code of Student Rights, Responsibilities, and Conduct.” Violating “The Code” will result in disciplinary action, which may include suspension or expulsion from the university.

Students with Disabilities: In accordance with University procedures, if you have a documented disability and require accommodations to obtain equal access in this course; please contact me privately to discuss your specific needs. You must be registered with the Center for Student Progress Disability Services, located at Kilcawley Center (Room 2082), and provide a letter of accommodation to coordinate reasonable accommodations. You can reach CSP Disability Services at 330-941-1372.

Center for Student Progress (CSP): The Marion G. Resch Center for Student Progress is a resource on Campus established to help students successfully complete their University experience. Please phone 330-941-3538 or visit the Center for assistance in tutoring or for

individualized assistance with social and academic success. The main Center is located in Kilcawley West below the bookstore.

Non-Discrimination from the University: Youngstown State University does not discriminate on the basis of race, color, national origin, sex, sexual orientation, gender identity and/or expression, disability, age, religion or veteran/military status in its programs or activities. Please visit www.yсу.edu/ada-accessibility for contact information for persons designated to handle questions about this policy.

Academic Dishonesty: As outlined in *The Student Code of Conduct*, all forms of academic dishonesty are prohibited at Youngstown State. This includes plagiarism, the unauthorized use of tools or notes in taking tests or completing assignments, fabrication of data or information used for an assignment, working with others without permission from the instructor, and more. A student who is believed to have violated the academic integrity policy will meet with the instructor to discuss the allegations. The student may accept responsibility for the violation and any sanctions selected by the instructor, or they have the right to ask for a hearing before a hearing panel. The full Academic Integrity policy can be found in Article III. 1. of *The Student Code of Conduct*, while further information on University procedures for alleged academic integrity violations can be found in Article V.

Class Cancellation: If this class is being cancelled for any one day due to instructor illness, or other reasons, an e-mail will be sent to the student's YSU e-mail account as soon as possible, and a cancelled class notice will be put on the classroom door. University-wide class cancellation is a decision made by the President's Office, and officially announced via the YSU homepage and on WYSU (88.5 FM) radio. Students may also register at the YSU Portal to receive a text message about University-Wide closures via the Emergency Alert Notification System.

Incomplete Grade Policy: An incomplete grade of "I" may be given to a student who has been doing satisfactory work in a course, but, for reasons beyond the control of the student and deemed justifiable by the instructor, has not completed all requirements for a course when grades were submitted. A letter grade MAY NOT be changed to an "I" (Incomplete) after the term has ended and grades have been recorded. For Fall Term courses, the final date to complete an "I" will be March 1 of the following term; for Spring Term courses, September 1; for Summer Term courses, October 1. These dates can only be extended with the approval of the instructor and the Dean of the College where the course is taught. Forms for extension of the deadline may be obtained in the Physics & Astronomy office and after obtaining the proper signatures, this form must be submitted to the University Records office 24 hours before the original deadline (i.e. for Fall Term courses, March 1 of the following term).

Semester: Fall 2018

Important Dates Full Term:

- *Wednesday, August 22, 2018* – First day of the semester
- *Wednesday, August 29, 2018* – The last day to add a class or change the grade option
- *Monday, September 3, 2018* – Labor Day (University Closed)
- *Tuesday, September 4, 2018* – The last day to withdraw with a full refund
- *Friday, October 26, 2018* – The last day to drop the course with a grade of “W”
- *Monday, November 12, 2018* – Veterans Day (University Closed)
- *Wednesday, November 21, 2018* – No Class, University Offices are Open
- *Thursday-Friday, November 22-23* – Thanksgiving Break (University Closed)
- *Saturday, December 15, 2018* – Term Ends

Need help? Stop in the Mathematics Assistance Center, Lincoln Building / Room 408, to inquire about the free services available for this course.

Mathematics Assistance Center (MAC): For all your mathematics needs:

- Tutoring
- Solutions Manuals
- Computers
- Study Area

Location: Lincoln Building Room 408

Website: <http://cms.ysu.edu/mathematics-assistance-center/math-assistance-center>

E-Mail: mac@ysu.edu

Phone: 330-941-3274

Hours: Monday-Thursday 9:00 AM – 6:00 PM

Friday 9:00 AM – 3:00 PM

Extended hours will be posted

Check for services available for your course