Syllabus for
MAT 232 – Elementary Statistics
3.0 Credit Hours
Spring 2022

I. COURSE DESCRIPTION

MAT 232 Elementary Statistics introduces students to foundational concepts of statistical reasoning, including (1) randomized sampling methods; (2) research design; (3) summary statistics—including measures of central tendency, spread, relative position, and visualizations (charts, graphs, and tables); (4) probability distributions; (5) correlation and regression; (6) confidence intervals; and (7) hypothesis testing. Students apply computer-based techniques to organize, interpret, and make inferences from data. The course emphasizes data-informed decision-making. (Does not count towards major or minor in mathematics.)

Pre-requisites: A grade of "C" or higher in MAT 105, MAT 106, MAT 201, or NUR 230; an ALEKS-PPL score of at least 50; or concurrent enrollment in MAT 231 (with an ALEKS PPL score of at least 30).

II. STUDENT LEARNING OUTCOMES FOR THIS COURSE

After successfully completing this course, students will be able to:

A. Classify data types and recognize research methodologies for both observational and experimental designs (Unit 1).
B. Organize and describe data sets using tables, charts, data visualizations (Unit 1), measures of center, variation, and position (Unit 2).
C. Analyze the interdependence of linearly correlated quantities to make predictions. (Unit 2). Apply discrete (Unit 3) and continuous (Unit 4) probability distributions—such as binomial (Unit 3) and normal distributions (Unit 4)—to calculate the probabilities of events (Unit 3 & 4).
D. Estimate and compare parameters by constructing confidence intervals (Unit 5) and testing hypotheses (Unit 6-7) based on sample data from one (Unit 5, 6) or multiple (Unit 7) populations.

III. ASSOCIATED PROGRAMS

This course meets degree completion requirements for the following programs:

A. General Education
    1. G4: Critical thinking - The ability to integrate knowledge in order to identify and weigh possible responses to different situations, and to process information—both analytically and critically—so as to determine the validity of different, competing claims.
    2. G4: Intellectual creativity – The ability to develop flexible thinking patterns and to process information analytically in a manner that results in the creation of new forms and structures.
    3. G5: Information literacy - The ability to access, evaluate, and use information, as well as to determine which sources to consult.
    4. G11: Communication skills – The ability to communicate effectively in both written and spoken forms at appropriate cultural, educational, economic, social, and maturity levels.
B. Mathematics
    1. Outcome 2: Students should learn to link applications and theory.
    2. Outcome 3: Students should learn to use technological tools.

IV. UNIVERSITY OUTCOMES

This course aligns with the following University Outcomes as indicated on the last page

A. Intellectual Pursuit

V. TEXTBOOKS AND OTHER LEARNING RESOURCES

A. Required Materials
    1. Textbook: Navidi, W., & Monk, B. (2022). ALEKS 360 (18-weeks) Online Access for Elementary Statistics (4th ed.). McGraw-Hill Higher Education. [ISBN: 9781264829439]

2. Other required materials:
    a. Microsoft Excel. This program is available free for all ORU Students through Microsoft 365. For more information, see https://oru.edu/information-technology/students/email/index.php
    b. TI-83/84 graphing calculator
    c. *MAT 232 Elementary Statistics Student Notebook*, a custom course materials packet available exclusively from the ORU bookstore. (Check with your professor if this is required for your section.)

VI. POLICIES AND PROCEDURES

A. Department Policies and Procedures

1. Attendance and Excessive Absences - Attendance at each class or laboratory is mandatory. Excessive absences can reduce a student's grade or deny credit for the course.
2. Unexcused Absences - Any student whose unexcused absences total 33%more of the total number of class sessions will receive an F for the course grade.
3. Computer Resources - Each Student who uses the computer is given access to the appropriate computer resources. These limited resources and privileges are given to allow students to perform course assignments. Abuse of these privileges will result in their curtailment. Students should note that the contents of computer directories are subject to review by instructors and the computer administrative staff.
4. Late Exams - Each instructor has his or her own late-exam policy, so an instructor may decide that an exam missed because of an unexcused absence cannot be made up.
5. Incompletes – As stated in the University catalog, incompletes are granted only for "good cause," such as extended hospitalization, long-term illness, or a death in the family. Students must petition for an incomplete using the "Petition for Incomplete" form at petitions.oru.edu. Very few incompletes are granted.

B. Course Policies and Procedures

1. Evaluation Procedures
    a. The grade for this course is based on the total number of points accumulated in each of five categories, weighted as follows:

ALEKS Unit Practice	35%
Quiz	14%
Unit Tests	12%
WPA, Projects & Forums	19%
Pie Progress	10%
Final Exam	10%

    b. Grading scale:
    A=90%
    B=80%
    C=70%
    D=60%
    F=59% and below
    The student who wants to know his or her running course grade should keep a record at all times of all grades earned.
2. Whole Person Assessment Requirements
    a. A WPA artifact is required for this course. For specific requirements, check the WPA handbook at http://wpahandbook.oru.edu. Artifacts not submitted electronically or incorrectly submitted receive a zero for that assignment. (Submission requirements are for students who have had Whole Person Assessment training.)
    b. The WPA assignment counts at least 5% of the student's grade.
3. Other Policies and/or Procedures

a. The only way to learn mathematics is to do mathematics. Therefore, the student must do homework regularly. The individual homework assignments are done utilizing *MyMathLab,* a product of Pearson. The starting and ending dates for each assignment are listed in the online assignment page and the calendar. Failure to complete homework on time may result in a zero for that assignment, which may eventually affect the midterm or final grade. Homework is a minimal course requirement.
b. Homework is assigned to provide students with the opportunity to learn the material. Therefore, students are encouraged to obtain assistance from anyone if they are having difficulty. The idea is to learn as much statistics as possible from one another. However, *MyMathLab* provides tutorials, practice tests and quizzes, video lectures, online help, and other resources that encourage independent learning. Of course, students are expected to work independently on tests.

VI. COURSE CALENDAR (for MWF Classes)

	Textbook References
Unit 1: Basic Ideas and Graphical Summaries of Data (5 class days)	§1.1, §1.2, §1.3, §1.4, §2.1, §2.2, §2.3, §2.4
Unit 2: Summarizing and Describing Data (5 class days)	§3.1, §3.2, §3.3, §4.1, §4.2, §4.3
Unit 3: Basic Probability & Discrete Probability Distributions (5 class days)	§5.1, §5.2, §5.3, §6.1, §6.2,
Test 1 over Units 1-3 (1 class day)	**Selected Sections: Chapters 1-6**
Unit 4: The Normal Distribution (4 class days)	§7.1, §7.2, §7.3, §7.4
Unit 5: Confidence Intervals (5 class days)	§8.1, §8.2, §8.3, §8.5
Unit 6: Hypothesis Testing (5 class days)	§9.1, §9.2, §9.3, §9.4, §9.6
Unit 7: 2-Sample Hypothesis Tests and ANOVA (5 class days)	**§11.1,§11.2,§11.3,§14.1**
Test 2 over Units 4-7 (1 class day)	**Selected Sections: Chapters 7-9, 11, 14**
Review for Final Exam (1 class day)	**Chapters 1-9, 11, 14**

Primary Program: General Education
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This course contributes to the University and program outcomes as indicated below:
Significant Contribution – Addresses the outcome directly and includes targeted assessment.
Moderate Contribution – Addresses the outcome directly or indirectly and includes some assessment.
Minimal Contribution – Addresses the outcome indirectly and includes little or no assessment.

OUTCOMES	Significant	Moderate	Minimal
Intellectual Pursuit			
G4: Critical Thinking – The ability to integrate knowledge in order to identify and weigh possible responses to different situations, and to process information—both analytically and critically—so as to determine the validity of different, competing claims.	**x**		
G4: Intellectual creativity – The ability to develop flexible thinking patterns and to process information analytically in a manner that results in the creation of new forms and structures;	**x**		
G5: Information literacy - The ability to access, evaluate, and use information, as well as to determine which sources to consult	**x**		
G11: Communication skills – The ability to communicate effectively in both written and spoken forms at appropriate cultural, educational, economic, social, and maturity levels		**x**	
Mathematics Outcome 2: Students should learn to link applications and theory		**x**	
Mathematics Outcome 3: Students should learn to use technological tools		**x**	
MAT 232: Classify data types and recognize research methodologies for both observational and experimental designs.	**x**		
MAT 232: Organize and describe data sets using tables, charts, data visualizations, measures of center, variation, and position.	**x**		
MAT 232: Analyze the interdependence of linearly correlated quantities to make predictions. Apply discrete and continuous probability distributions — such as binomial and normal distributions — to calculate the probabilities of events.	**x**		
MAT 232: Estimate and compare parameters by constructing confidence intervals and testing hypotheses based on sample data from one or multiple populations.	**x**		

(Revised 12/20/21)