Course Syllabus

LMAT 232—Elementary Statistics
3 Credit hours

I. COURSE DESCRIPTION

Designed for students of social and health sciences, education, and business. Includes both descriptive and inferential methods and treats the fundamental concepts exemplified by frequency distributions, measures of central tendency, and variability; the interpretation of results; hypothesis testing; regression; analysis of variance; and chi-square. (Does not count towards major or minor in mathematics.)

Prerequisites: MAT 105(with a grade of C or higher), 106, 201, NUR 230, SAT math score of at least 520, or ACT math score of at least 22. Course fee $30.

II. ACADEMIC MISSION

Oral Roberts University's academic mission is to transform students by the power of the Holy Spirit into whole, competent servant-leaders through liberal arts and professional education that is fully Christian. Within a Spirit-filled healing community, administration, faculty, and staff love and serve students by helping them grow in knowledge, skills, wisdom, character, and spirit.

Student transformation is measured through the evaluation of student expression of University learning outcomes as demonstrated through accompanying proficiencies and capacities.

Spiritually alive	Biblical knowledge; sensitivity to the Holy Spirit; evangelistic capability; ethical behavior
Intellectually alert	Critical thinking; information literacy; global and historical perspectives; aesthetic appreciation; intellectual creativity
Physically disciplined	Healthy lifestyle; physically active lifestyle
Socially adept	Communication skills; interpersonal skills; appreciation of cultural and linguistic differences; responsible citizenship; leadership capacity
Professionally competent	Discipline-specific proficiencies listed under Program Outcomes.

The last page of this syllabus, "COURSE INVENTORY for ORU's Course Objectives," indicates how this course supports ORU's academic mission and ORU's whole-person approach to learning outcomes through its ePortfolio system.

III. COURSE GOALS

The purpose of this course is to enable the student to be able to do the following:

A. Understand the concept of the whole person—an integrated individual who is intellectually alert and spiritually alive by engaging in a quest for knowledge of his or her relationship to God, other people, and the universe and intelligently fill the many roles encountered in everyday life, such as that of the consumer.
B. Become statistically literate and make statistical decisions in his or her own field of practice, thus enabling him or her to go into everyone's world with healing for the totality of human need.
C. Understand the groundwork and basic tools of statistical analysis, which includes proficiency with graphing calculators and computer software, for pursuing research purposes or for more concentrated study in his or her chosen discipline.

IV. COURSE OBJECTIVES

As a result of successfully completing this course, you should be able to:

Terminal Objectives

A. Summarize raw data using graphical methods.
B. Summarize raw data by descriptive statistical methods.
C. Quote the Central Limit Theorem.
D. Apply rules for determining the probabilities of events.
E. Construct and interpret confidence intervals for estimating population values.
F. Make predictions.
G. Complete a test of hypothesis using appropriate formulas and techniques in the following categories:
    1. Value of population proportion
    2. Value of population mean
    3. Difference between means
    4. Analysis of variance
    5. Correlation
    6. Value of population standard deviation

Unit Objectives

A. Unit I: The student studies approaches to statistics, random sampling, mode, median, mean, variance, standard deviation, percentiles, percentile ranks, z scores, discrete and continuous variables, histograms, and frequency polygons.
    1. Give examples of descriptive and inferential statistics.
    2. Given a data set, represent it using appropriate graphical tools.
    3. Name and define the measures of central tendency and dispersion.
    4. Given a data set, compute the mode, median, mean, variance, standard deviation, percentile ranks, and z scores.
    5. Calculate the probabilities of simple and compound events.
B. Unit II: The student studies the binomial distribution, the normal distribution, sampling distributions of sums and means, the normal approximation to the binomial, and the sampling distribution of proportions.
    1. State properties of the binomial and normal distributions.
    2. Calculate probabilities using the binomial and normal distributions.
    3. Find areas of sectors under the normal curve.

4. Find percentiles and percentile ranks in normal distributions and sampling distributions of means, sums, and proportions.
5. State the Central Limit Theorem.
6. Compute the probabilities of events occurring in experiments involving discrete sample spaces.
7. Compute the probabilities of events occurring in binomial experiments using a normal approximation.

C. Unit III: The student studies the hypothesis testing procedure, unbiased point estimation of the population mean, variance, standard deviation, and proportion, and interval estimation.
   1. Find unbiased point estimates for a population mean, variance, standard, and proportion.
   2. Find confidence intervals for population means and proportions.
   3. Calculate the probability of a type-one error occurring for tests involving hypotheses regarding population proportions and means.
   4. Perform tests of hypotheses involving population proportions.
   5. Perform tests of hypotheses involving population means when population standard deviation is known (z tests).
   6. Perform tests of hypotheses involving population means when population standard deviation is unknown (t tests).
   7. Translate real-world theories into hypotheses and test them by appropriate means.

D. Unit IV: The student studies analysis of variance, regression analysis, correlation analysis, and the chi square tests for the value of a population standard deviation.
   1. Perform tests of hypotheses involving the differences among a group of population means (ANOVA).
   2. Draw a scattergram given two scores for each subject in a group and sketch a regression curve.
   3. Develop the equation of the best-fit straight line to a raw score scattergram (prediction formula) and use it to make predictions.
   4. Compute and interpret the correlation coefficient between two variables.

Objectives for Students in Teacher Preparation Programs

The Teacher Preparation Program meets the competency-based requirements established by the Oklahoma Commission on Teacher Preparation. This course meets the following competency: Subject Competency (SC) 8.

SC 8: Is proficient in the use of a variety of instructional strategies to include, but is not limited to, cooperative learning, use of concrete material, use of technology (i.e., calculators and computers), and writing strategies to stimulate and facilitate student learning.

V. TEXTBOOK AND OTHER LEARNING RESOURCES

Textbook(s) and materials for the course are listed using standard citation style (APA, MLA, Chicago, Turabian, etc.). Since other styles may be used in disciplines other than the one used in this course or school, the ORU Citing and Documenting Sources pages offer a collection of styles students may choose from. This course asks that students be consistent in whatever style they use throughout the course.

Required Materials

Textbook:

Triola, Mario M. *Elementary Statistics Using Excel*. (Loose Pgs)(w/MyStatLab w/Pearson eText--Access Card) 13th ed. Boston, MA: Pearson Education, 2013. [ISBN: 9780134763798]

Note: Students who choose to buy a used book, instead of the package, must buy a new MyMathLab access code.
Triola, Mario M. *Elementary Statistics Using Excel*. (MyStatLabEtext Stand Alone Acc) 13th ed. Boston, MA: Pearson Education, 2013. [ISBN: 9780134748535]

The ORU Bookstore carries print as well as eTexts of assigned textbooks.
http://www.bkstr.com/oralrobertsstore/home

Other required materials:

A calculator with statistical functions is required. The recommended calculators for this course are the Texas Instruments TI-83/84 plus.

VI. POLICIES AND PROCEDURES

A. University Policies and Procedures

1. **Participation:** Participation in each online class through discussion forums, assignments, and all other course activities is mandatory at Oral Roberts University. This counts as your attendance in the course. Excessive absences can reduce a student's grade or deny credit for the course.
2. **Plagiarism:** The ORU Catalog explicitly addresses the issue of plagiarism. Make sure you know ORU's policy on plagiarism and what is considered plagiarism.
3. **Privacy:** By law, students are entitled to privacy regarding their records. The Family Educational Rights and Privacy Act of 1974 (FERPA), as amended and available in the ORU University Catalog, sets forth requirements designed to protect the privacy of student education records. The law governs access to records maintained by educational institutions and the release of information from those records.
4. **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 as 5% of the student's grade.
    c. Artifacts not submitted electronically or incorrectly submitted receive a zero for that assignment.

B. School and/or Department Policies and Procedures

1. Class Assignments

a. Students need to have the appropriate textbooks, course materials, and other supplies as designated by the professor.
b. Professors may refuse to accept an assignment if it has inappropriate content, does not meet the assignment's criteria (e.g., not typed, incorrectly documented), is incomplete, is suspected of plagiarism, or is turned in too late.

2. Late Work

a. The student is responsible for obtaining class assignments and materials, and all work is expected to be completed as scheduled. Late work may not be accepted by the professor, or it may result in a lower grade. Computer or Internet malfunctions do not constitute an excuse for late work; students should have their work prepared in time to ensure that they can get it completed, edited, and proofread prior to the instructor's due date. These responsibilities assist the student in professional development.
b. Generally, assignments missed from a serious sickness or family crises can be made up and the instructor should be notified as soon as possible to reach an agreement on due dates and possible penalties. Each instructor has his or her own late-work policy. Instructors use their own judgment in accepting late work.

3. Incompletes

On rare occasions, the grade of "I" may be given for work that is incomplete at the time grades are given. It is given only after the instructor and the department chair or college dean approve a petition submitted by the student that his or her work is incomplete for good cause. Good cause typically consists of a catastrophic event in which the student is prevented from completing the course requirements. It is the responsibility of the student to initiate the petition through http://petitions.oru.edu, make up any incomplete work, and ask the instructor to submit a grade change to the registrar. If the work is not completed by the end of the subsequent session, the incomplete will automatically convert to an "F." For graduating seniors, the degree will be awarded in the term that the student completes his or her course work, not the final term of enrollment.

C. Online Programs Policies and Procedures

1. **Communicating with your Instructor:** All email communication between students and faculty will be through their ORU.edu emails.
2. **Learning Community:** Online learning community is established through active participation in the threaded weekly discussions. The mutual exchange of ideas, information, and experiences is an essential part of the learning process, and students are encouraged to use the discussion forum as virtual classroom platform.
3. **ADA and Students with Disabilities:**
   - Click here (http://www.brightspace.com/about/accessibility/) to view Desire2Learn's "Accessibility Resources for Students with Disabilities."
   - Students requiring Disability Services from ORU, please click here: https://goo.gl/QGoK4x
   - Desire2Learn (D2L) Accessibility Guidelines and Checklist: https://goo.gl/Ck4RwY
   - D2L Accessibility Policy: https://www.d2l.com/accessibility/
4. **Useful Links for Online Students:**
   - Student Learning Glossary
   - Library: http://library.oru.edu.
   - D2L Helpdesk: d2lhelp@oru.edu
   - I.T. Student Helpdesk: studenthelpdesk@oru.edu
   - Netiquette and Online Discussions: https://goo.gl/f744AY
   - Contact the University: please fill out this online form. Please first contact your instructor for assistance with any matter specific to the course.

D. Course Policies and Procedures

1. **Evaluation Procedures:** The final grade will be based on the following distribution of points:

Points	Category
300 pts.	Homework
450 pts.	Tests
50 pts.	Discussions
50 pts.	WPA Assignment
200 pts.	Final Exam

2. **Grading Scale:** A=90-100% B=80-89% C=70-79% D=60-69% F=59% and below.

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.

VII. Course Calendar

Lesson	Section	Topic
1		Orientation, Syllabus
2		1.2 Stat and Critical Thinking
3		1-3 Types of Data
4		1-4 Collecting Sample Data
5		2-2 Frequency Distributions
6		2-3 Histograms
7		2.4 Statistical Graphics/Critical Thinking-Bad Graphs
8		3.2 Measures of Center
9		3.3 Measures of Variation
10-11	3.4	Measures of Relative Standing and Boxplots
12		Review for Exam I
13		Exam I Chapters 1-3
14		4-2 Basic Concepts of Probability
15		4-3 Probability Addition Rule
16		5-2 Probability Distributions
17		5-3 Binomial Probability Distributions
18		5-3 Binomial Probability Distributions
19		5-4 Parameters for Binomial Distribution
20		6-2 The Standard Normal Distribution
21		6-3 Applications of Normal Distributions
22		6-5 The Central Limit Theorem
23		6.7 Normal as Approximation to Binomial
24		Review for Exam II
25		Exam II Chapters 4-6
26		7-2 Estimating a Population Proportion
27		7-3 Estimating a Population Mean
28		7-4 Estimating a Population Variance or Standard Deviation
29-30	8-2	Basics of Hypothesis Testing
31		8-3 Testing a Claim about a Proportion
32		8-4 Testing a Claim about a Mean
33		8.5 Testing a Claim about □ (standard deviation) or $□^2$ (variance)
34		Review for Exam III
35		Exam III Chapters 7-8
36		10-2 Correlation
37		10-3 Regression
38		12-2 One-Way Anova
39-40		Review for Final Exam
		Final Exam

VIII. COURSE INVENTORY

For ORU's Student Learning Outcomes

LMAT 232—Elementary Statistics

This course contributes to the ORU course objectives 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.
No Contribution – Does not address the outcome.

The Student Learning Glossary at http://ir.oru.edu/doc/glossary.pdf defines each outcome and each of the proficiencies/capacities.

	OUTCOMES & Proficiencies/Capacities	Significant Contribution	Moderate Contribution	Minimal Contribution	No Contribution
1	**Outcome #1 – Spiritually Alive**				
1A	Biblical knowledge				X
1B	Sensitivity to the Holy Spirit				X
1C	Evangelistic capability				X
1D	Ethical Behavior				X
2	**Outcome #2 – Intellectually Alert**				
2A	Critical thinking	X			
2C	Global & historical perspectives			X	
2D	Aesthetic appreciation				X
2E	Intellectual creativity		X		
2F	Information literacy		X		
3	**Outcome #3 – Physically Disciplined**				
3A	Healthy lifestyle				X
3B	Physically disciplined lifestyle				X
3C	Properly balanced nutrition plan				X
4	**Outcome #4 – Socially Adept**				
4A	Communication skills		X		
4B	Interpersonal skills			X	
4C	Appreciation of cultural & linguistic differences				X
4D	Responsible citizenship		X		
4E	Leadership capacity				X

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This syllabus is subject to change without notice up until the first day of the semester.

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