ORU
ORAL ROBERTS UNIVERSITY

Course Syllabus

LMAT 151 — Mathematics and Society

3 Credit hours

I. COURSE DESCRIPTION

A study of the pattern and order in the universe, including creative thought in making conjectures based on inductive reasoning and application in problem-solving using deductive reasoning.
Covers problem-solving, statistics, finance and logic. (Does not count toward a major or minor in mathematics. Writing-intensive sections are available.)

Prerequisites: None

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.

III. COURSE GOALS

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

A. Recognize God's pattern and order in the universe.
B. Become mathematically literate.
C. Engage in proportional, hypothetical, logical, and indirect reasoning.
D. Construct inductive and deductive arguments.
E. Develop the ability to use numbers to describe and model natural phenomena in daily life in order to better understand the world around them and solve real-world problems.
F. Develop the ability to use inductive and deductive reasoning to recognize, extend, and generalize patterns and arguments.
G. Learn George Polya's four-step problem-solving framework and apply it in a variety of problem-solving experiences.
H. Learn to use statistics to evaluate and interpret the vast amount of information that is presented in the media today.
I. Make wise financial decisions in the areas of sales, insurance, annuities, loan payments, credit card interest, and mortgages.

IV. COURSE OBJECTIVES

After successfully completing this course, I should be able to complete the following:

A. Terminal Objectives
    1. Perform problem solving
    2. Use logic and critical thinking
    3. Apply statistics to everyday problems
    4. Calculate the solutions to Finance problems.

After successfully completing this course, I should be able to complete the following:

1. Unit 1 — Problem Solving and Patterns
    a. Describe the difference between inductive and deductive reasoning.
    b. Identify different types of sequences and determine a general rule for some types of sequences.
    c. Use Polya's problem-solving framework to solve problems.
    d. Identify the Fibonacci sequence and discuss its relationship to objects in nature.
    e. Discuss applications of the golden ratio.
    f. Discuss Pascal's triangle and its applications.
    g. Describe fractals and their applications.
    h. Research and report as part of a team of students on a topic relating mathematics to other areas of life, such as nature, history, fine arts, etc.
2. Unit 2 — Logic and Critical Thinking
    a. Identify and use the basics of mathematical logic.
    b. Write a negation.
    c. Construct truth tables.
    d. Decide whether a statement is true or false.
    e. Determine whether statements are equivalent.
    f. Write the converse, inverse, and contrapositive of an "if then" statement.
    g. Analyze arguments and identify fallacies.
    h. Determine the validity and soundness of deductive arguments.
3. Unit 3 — Statistics

a. Determine the believability of a statistical study.
b. Construct the following types of graphs from a given set of data.
    i. Vertical bar graph
    ii. Horizontal bar graph
    iii. Comparative bar graph
    iv. Pictogram
    v. Circle graph
    vi. Frequency distribution table
    vii. Histogram
    viii. Frequency polygon
c. State four measures of central tendency and distinguish among them.
d. Compute the mean, median, mode, and midrange for a given set of data.
e. Determine the shape of a given distribution.
f. Find the five number summary of a set of data.
g. State two measures of dispersion and distinguish between them.
h. Compute the range, variance, and standard deviation for a given set of data.
i. Calculate what percentage of normally distributed data is within a given number of standard deviations from the mean.
j. Determine the margin of error of a given set of data.
k. Discuss the possible validity of a statistical study.

4. Unit 4— Finance
    a. Convert a percent to a decimal or fraction and convert decimals and fractions to percentages.
    b. Discuss the uses and abuses of percentages.
    c. Use estimation to solve problems and make projections.
    d. Compute simple interest.
    e. Compute compound amount and compound interest.
    f. Find the effective annual interest rate of a given loan or investment.
    g. Calculate the monthly payments for principal and interest for loans of various lengths at various interest rates.
    h. Calculate interest and new balance forcredit cards.
    i. Calculate the annuity necessary to save a given amount of money for retirement.
    j. Calculate the amount in a saving plan after depositing a given annuity at certain intervals into a savings plan.
    k. Demonstrate sound reasoning in making financial decisions by working with a team and completing a project written report.

B. Objectives for Students in Teacher Preparation Programs

The course goals for the Teacher Preparation Program now meet the "competency-based" requirements established by the Oklahoma Commission on Teacher Preparation. This course meets Subject Competencies 5, 6, and 7.

SC5: Understands significant connections among mathematical ideas and the applications of these ideas to problem solving in mathematics, in other disciplines, and in the world outside of school.

SC6: Has experiences with practical applications of mathematical ideas and is able

to incorporate these in curricular and instructional decisions.

SC7: Is proficient in, at least, the mathematics content needed to teach the mathematics skills described in Oklahoma's core curriculum, from multiple perspectives. This includes, but is not limited to, a concrete and abstract understanding of number systems and number theory, geometry and measurement, statistics and probability, functions, algebra, discrete mathematics, and calculus necessary to effectively teach the mathematics skills addressed in the first through eighth grade in the Oklahoma core curriculum

V. TEXTBOOK AND OTHER LEARNING RESOURCES

Before you purchase your required textbook(s), click on the ORU Bookstore link to verify whether digital texts are provided as part of your Follett Access course fee. http://www.bkstr.com/oralrobertsstore/home

Required Materials

Textbook:

Miller, Charles D. *Mathematical Ideas, 13th Edition*. Pearson Education, 2016
[ISBN: 9780321977076; Digital ISBN: 9780134462714] (Includes textbook, Student Solutions Manual, and MyMathLab access code)

Note: A MyMathLab packet (access code) should be packaged with the textbook. The student will also have the option to purchase a separate MyMathLab packet in order to be able to complete the homework assignments. The MyMathLab packet includes an online version of the textbook.

Other required materials:

A scientific calculator (a programmable calculator is not recommended)

Optional Materials

Textbooks:

None

Other:

None

VI. POLICIES AND PROCEDURES

A. University Policies and Procedures

1. **Plagiarism:** The ORU Catalog explicitly addresses the issue of plagiarism. Make sure you know ORU's policy on plagiarism and what is considered plagiarism.
2. **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.
3. **Whole Person Assessment Requirements:**
   - **a.** Specify which, if any, Whole Person Assessment requirements there are for this course. The artifact for this course is a paper. Specific instructions located in D2L.
   - **b.** Artifacts not submitted electronically or incorrectly submitted receive a zero for that assignment.

B. School and/or Department Policies and Procedures

1. **Participation:** Participation in each online class through discussion forums, assignments, and all other course activities count as your attendance in the course. Lack of participation can reduce a student's grade or deny credit for the course.
2. **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.
3. **Late Work**
   - **a.** The student is responsible for obtaining class assignments and materials, and all work is expected to be completed as scheduled. The professor may not accept late work, 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.
4. **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.
5. **Citations**

   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.

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:**
   - 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 forum discussions, projects, and a final exam. The weight of each item is included in the Course Calendar. Extra credit items are not offered in this course

Points	Category
10	Discussion Forums
240	MyMathLab Homework
150	Unit Projects
50	Practice Mid-Term
100	Midterm Examination
50	Practice Final
200	Final Examination

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. Any assignment turned in late may have points deducted. All homework problems completed after the due date will have a 20% penalty assessed. Everything completed correctly before the due date will have no penalty. Practice tests and chapter exams are not available after the due date.
   b. Completing the homework is essential. Because mathematics builds upon previously developed concepts, the student's progress in the learning process depends on proper pacing. The best way to ensure maximum learning is for each student to give immediate attention to each assignment presented.
   c. Specific homework assignments are given in MyMathLab and a tentative schedule is listed in Part VI of the syllabus.
   d. All math problems will be done online with MyMathLab. Discussions will be required and part of your grade.
   e. Credit by examination. All ORU students are expected to take one college- level mathematics course. If the material in this course and MAT 105 were studied in high school, the student is expected to take Calculus I (MAT 201). Consequently, credit for this course by examination is not permitted.
   f. If a syllabus revision is necessary for any reason, the instructor will notify the students on D2L and by email.
   g. There is a practice before each exam that a student may take as many times as preferred to obtain the best possible score. I will enter the highest score in the grade book on D2L.g.Do not wait until the last minute to do any assignments – computer

glitches happen, internet services occasionally go out, websites can go down. Working early helps keep these kind of issues from affecting your grade negatively.

VII. COURSE CALENDAR

The Course Calendar shows the specific learning activities and assessments for this course. Further descriptions for activities and assessments are in their respective weeks in D2L. When applicable, ¥ Indicates this is a Whole Person Assessment item that is also submitted to the E-Portfolio system. † indicates this is a faith integration item tracked by the program.

Week 1	
	Read/View/Listen
	Homework (MyMathLab): Chap. O, 1.1-1.4, 5.5
Week 2	
	Read/View/Listen
	Homework (MyMathLab): Chap. 3.1-3.5
Week 3	
	Read/View/Listen
	Homework (MyMathLab): Chap. 3.6, 9.8, 10.4
Week 4	
	Read/View/Listen
	Forum 4: Faith and Reasoning
	Project 4: Logic Paper
	Practice Mid-Term
	Quiz 4: Mid-Term Exam
Week 5	
	Read/View/Listen
	Homework (MyMathLab): Chap. 13.1-13.5
Week 6	
	Read/View/Listen
	Homework (MyMathLab): Chap. 12.1-12.5
Week 7	
	Read/View/Listen
	Project 7: Statistics **¥**
	Practice Final
	Quiz 7: Final Exam

VIII. COURSE INVENTORY

For ORU's Course Objectives

LMAT 151

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.

ORU defines each outcome and proficiencies/capacities listed below in this Gen Ed Outcomes paper.

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

This syllabus is subject to change without notice up until the first day of the semester.
Oral Roberts University | 7777 S. Lewis Avenue, Tulsa, OK 74171
E-mail: online@oru.edu | Web site: http://www.oru.edu