Syllabus for
MAT 114—Mathematical Analysis II
3 Credit Hours
Spring 2011

I. COURSE DESCRIPTION

A continuation of MAT 113. The concepts developed in the first course are expanded and considered in relationship to rational functions, trigonometric functions, and conic sections. (This is the second course in a two-semester sequence preparing students for calculus. Does not count toward a major or minor in mathematics.)
Prerequisites: MAT 113.

II. COURSE GOALS

This course is the second of a two-course series in mathematical analysis that provides the prerequisites for the study of calculus. This course, in concert with Mathematical Analysis I, enables the student in pre-medicine, computer science, and pre-engineering (as well as other scientific disciplines) the opportunity to develop the background required for the science or mathematical courses required in their chosen field.

III. STUDENT LEARNING OUTCOMES FOR THIS COURSE

A. Objectives

As a result of successfully completing this course the student will be able to do the following:

1. Define the sine and cosine functions in terms of the unit circle.
2. Define other trigonometric functions in terms of sine and cosine.
3. List and apply the fundamental identities for circular functions.
4. Prove trigonometric identities by use of the fundamental identities.
5. State and use the sum-difference, reduction and multiple value formulas of the trigonometric identities.
6. Solve trigonometric equations.
7. Graph the six trigonometric functions and other sinusoids with respect to amplitude, period, phase shift, etc.
8. Define and identify uses of the inverse trigonometric functions.
9. Solve trigonometric problems involving triangles using the law of sines, cosines, and other special cases.
10. Convert measurement from degrees to radians, and conversely.
11. List the characteristics of the graph of an ellipse, parabola, and hyperbola.

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 5,6,7,8, and 9.

SC5: Has a broad and deep knowledge of the concepts, principles, techniques, and reasoning methods of mathematics that is used to set curricular goals and shape teaching.

SC6: 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.

SC7: Has experiences with practical applications of mathematical ideas and is able to incorporate these in curricular and instructional decisions.

SC8: 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 sixth through twelfth grade in the Oklahoma core curriculum. (The depth and breadth of knowledge should be much greater than for the Intermediate Mathematics certification.)

SC9: Is proficient in the use of a variety of instructional strategies to include, but is not limited to, cooperative learning, use of concrete materials, use of technology (i.e., calculators and computers), and writing strategies to stimulate and facilitate student learning.

IV. TEXTBOOKS AND OTHER LEARNING RESOURCES

A. Required Materials

1. Textbook
   Margaret Lial, John Hornsby, and David Schneider. Precalculus. New York: Addison-Wesley, 2007. Fourth Edition, ISBN-10:0-321-52884-0
2. Other
   MyMathLab is an on-line software product that allows the student to do homework math problems accompanied with immediate feedback, context sensitive help, examples, multiple tries for each problem, and pages to read from the textbook. The software also contains a grade book and testing features. The Internet site for the course is **http://www.coursecompass.com/**. The CourseCompass course name is MAT 114 Math Analysis II. Each student will purchase a MyMathLab access key code, go to the Internet site listed above, and join the class that has the class code of "ward29095". If the book store is out of student access kits, a credit card or PayPal can be used for the purchase at the Internet site.
3. A graphing calculator is required. The instructor will be using the TI-84 Plus Silver Edition throughout the course.

B. Optional Materials

None

V. POLICIES AND PROCEDURES

A. University Policies and Procedures

1. Attendance at each class or laboratory is mandatory at Oral Roberts University. Excessive absences can reduce a student's grade or deny credit for the course.
2. Students taking a late exam because of an unauthorized absence are charged a late exam fee.
3. Students and faculty at Oral Roberts University must adhere to all laws addressing the ethical use of others' materials, whether it is in the form of print, electronic, video, multimedia, or computer software. Plagiarism and other forms

of cheating involve both lying and stealing and are violations of ORU's Honor Code: "I will not cheat or plagiarize; I will do my own academic work and will not inappropriately collaborate with other students on assignments." Plagiarism is usually defined as copying someone else's ideas, words, or sentence structure and submitting them as one's own. Other forms of academic dishonesty include (but are not limited to) the following:

a. Submitting another's work as one's own or colluding with someone else and submitting that work as though it were his or hers;
b. Failing to meet group assignment or project requirements while claiming to have done so;
c. Failing to cite sources used in a paper;
d. Creating results for experiments, observations, interviews, or projects that were not done;
e. Receiving or giving unauthorized help on assignments.

By submitting an assignment in any form, the student gives permission for the assignment to be checked for plagiarism, either by submitting the work for electronic verification or by other means. Penalties for any of the above infractions may result in disciplinary action including failing the assignment or failing the course or expulsion from the University, as determined by department and University guidelines.

4. Final exams cannot be given before their scheduled times. Students need to check the final exam schedule before planning return flights or other events at the end of the semester.
5. Students are to be in compliance with University, school, and departmental policies regarding Whole Person Assessment (WPA) requirements. Students should consult the WPA handbooks for requirements regarding general education and the students' majors.
   a. The penalty for not submitting electronically or for incorrectly submitting an ePortfolio artifact is a zero for that assignment.
   b. By submitting an assignment, the student gives permission for the assignment to be assessed electronically.

B. Department Policies and Procedures

1. 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.
2. A fee of $15.00 will be assessed for all late exams. This policy applies to all exams taken without notifying the professor prior to the regularly scheduled exam time, and to all exams taken late without an administrative excuse.
3. Any student whose unexcused absences total 33% or more of the total number of class sessions will receive an F for the course grade.

C. Course Policies and Procedures

1. Evaluation Procedures may vary according to software available, and instructor preferences:
   a. One-period examinations (up to 4 in number) count 100 points each.
   b. Quizzes (if given) and homework are worth up to a total of 340 points. Any assignment turned in late may have points deducted.

c. Response paper worth 50 points. If used as Whole Person Assessment artifact must be submitted properly and on time to avoid receiving a 0 or a deduction on the paper.
d. Grade Categories and Weights
e. The final exam is comprehensive and count from 150 to 200 points.
f. The course grade will be determined by the percentage of total points accumulated: 90-100%, A; 80-89%, B; 70-79%, C; 60-69%, D; Below 60%, F. Excessive absenteeism or discipline problems may cause a deduction in the course grade.

	Weights	Points	Points	Weights
Test1	10.6%	100	100	10.6%
Test2	10.6%	100	100	10.6%
Test3	10.6%	100	100	10.6%
Test4	10.6%	100	100	10.6%
Final	16.0%	150	200	21.3%
Homework	36.2%	340	340	36.2%
E-portfolio	5.3%	50	n/a	
	Totals	940	940	

The table above shows the approximate grade calculations for the class. The percentages and categories may vary somewhat depending on your instructor, the capabilities of the software, and grade book used.
Barring any points being deducted for absenteeism, late assignments, or incorrect class participation, the course grade will be awarded on as a percentage of the totaled pointes accumulated during the semester. If the total points is 940, grades would be awarded according the table at the right.

Grade	Points
A	940 - 846
B	845 - 752
C	751 - 658
D	657 - 564
F	563 - 0

2. Whole Person Assessment Requirements
A Whole Person Assessment artifact is required for this course or MAT 201.
For specific requirements check the General Education WPS handbook at http://eportfolio.oru.edu/servlet/page?_pageid=1883&_dad=portal30&_schema=PORTAL30&p_page=GEH and click on the "General Education Whole Person assessment Handbook Fall 2005" link.
3. Other Policies and Procedures
a. Homework. 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. Specific homework assignments are given in MyMathLab or in Part VI of the syllabus. An asterisk notes "Write-up" problems. Students should refer to the handout for the correct procedure on "Write-up" problems.
b. Depending on the instructor, homework may be written, on-line with MyMathLab, or a combination of the two. Work in class work may also be required and part of your grade.

c. Credit by Examination. All Oral Roberts University students are expected to take one college-level mathematics course. If the material in this course and MAT 113 was studied in high school, the student is expected to take Calculus I (MAT 201). Consequently, credit for this course by examination is not permitted.

VI. COURSE CALENDAR

Day	Section	Topic	Example Assignments	#
		Chapter 5: Trigonometric Functions		
1, 2	5.1	Angles	pp. 499-502: # 5, 14,16, 19,25,34, 35, 46, 53, 59, 63, 83,106, 109,117	1
3, 4	5.2	Trigonometric Functions	pp. 512-515: # 1, 4, 24, 41, 46, 54, 57, 76, 80, 81, 93, 96, 101, 107	2
5	5.3	Evaluating Trigonometric Functions	pp. 524-529: # 1, 12, 16,18, 28,35, 45, 50, 72, 99, 100, 113, 118, 123, 125, 132	3
6, 7	5.4	Solving Right Triangles	pp.538-545: # 5, 9,17, 31, 32, 33, 36, 39, 40, 49, 57, 64	4
		Chapter 6: The Circular Functions and Their Graphs		
8	6.1	Radian Measure	pp.564-571: 7, 11, 16, 26, 30, 36, 41, 43, 55, 58, 64, 67, 70, 101, 109	5
9	6.2	The Unit Circle and Circular Functions	pp.552-556:# 2, 7, 12, 22, 24, 27, 71	6
10		Review		
11		Test (5.1-6.2)		
12	6.3	Graphs of the Sine and Cosine Functions	pp. 593-598: # 1-8, 14, 16, 19, 23, 25, 29, 32,	7
13	6.4	Translations of the graphs of Sine and Cosine Functions	pp. 604-607: # 1-5, 23, 25, 29, 39, 52, 53	8
14, 15	6.5	Graphs of other Functions	pp. 620-623: 1-6,9,13,15,21,28,29 . 45-48,49,53,60	
16	7.1	Fundamental Identities	pp. 646-648: # 15, 17, 19, 25, 30, 33, 34, 38, 40, 54, 58, 61,67	9
17, 18	7.2	Verifying Trigonometric Identities	pp. 654-657: # 2, 6, 8, 13, 18, 35, 40, 43, 45, 51, 64, 69, 73, 76	10
19, 20	7.3	Sum and Difference Identities	pp. 667-670: # 7, 11, 21, 22, 25, 29, 35, 45, 51, 53, 74, 83, 99, 102, 105	11

Day	Section	Topic	Example Assignments	#
21, 22	7.4	Double-Angle and Half-Angle Identities	pp. 681-685: # 1, 3, 7, 11, 18, 29, 30, 37, 40, 45	12
23		Review		
24		Test (6.3-7.4)		
25,26	7.5	Assign Response Paper Inverse Circular Functions	pp. 696-700: # 7, 8, 13, 14, 35, 36,38, 47, 58, 77, 81, 83, 90, 91	13
27, 28	7.6	Trigonometric Equations	pp. 708-711: # 12, 15, 17, 24, 27, 28, 30, 31, 57, 59, 75, 76, 77	14
29	7.7	Equations Involving Inverse Trigonometric Functions	pp. 715-718 : # 1-4, 5, 9, 10	15
		Chapter 8; Applications of Trigonometry		
30, 31	8.1	The Law of Sines	pp. 741-748 : # 2, 3, 7, 10, 13, 25-27, 33, 38, 41, 55, 62, 75, 84	
32, 33	8.2	The Law of Cosines	pp. 755-762 : # 9, 11, 14, 16, 20, 25, 30, 36, 61, 65, 68, 73	16
34		Review		
35		Test (7.5-8.2)		
36, 37	8.8	Parametric Equations, Graphs, and Applications	pp. 818-821 : # 1-3, 5, 8, 11, 13, 17, 20, 24, 28, 39, 42	17
		Chapter 10; Analytic Geometry		
38, 39	10.1	Parabolas	pp. 957-960: # 2, 3, 8, 11, 13, 19, 24, 25, 31, 33, 36, 39, 53	18
40	10.2	Ellipses	pp. 968-970: # 2, 3, 5, 8, 10, 12, 15, 18	19
41	10.3	Hyperbolas	pp. 977-980: # 1-4, 5, 8, 12, 15, 20	20
42		Review		
43		Test (8.9, 10.1-10.3)		
44, 45		Review For Final Examination		

Course Inventory for ORU's Student Learning Outcomes

MAT 114—Mathematical Analysis II
Spring 2011

This course contributes to the ORU student learning 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.
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** 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
	Responsible citizenship			x	
4E	Leadership capacity				x