



MASTER COURSE OUTLINE

A. MATH 1110 College Algebra

B. COURSE DESCRIPTION:

This course covers the basics of college level algebra emphasizing understanding of the basic principles through investigation. The topics covered range from a basic algebra review to exploration of linear, quadratic, exponential, and logarithmic functions along with a study of rational expressions, inverse relations, function operations, complex numbers, and systems of equations. Prerequisites: Math 0670 with a grade of C or better or appropriate placement in course based on Multiple Measures for Course Placement – Math Decision Band Chart.

MnTC (Goals 4/MA and Goal 2/CT); (3 Cr - 3 lect, 0 lab)

C. *MnTC Discipline: Mathematical/Logical Reasoning **Core Theme: Critical Thinking

D. RIVERLAND INSTITUTIONAL LEARNING OUTCOMES:

This course addresses the following Riverland Institutional Learning Outcome(s):

- ILO 1: critical thinking (*Core Theme Goal 2*)
- ILO 2: awareness of the larger global community (*Core Theme Goal 7 or 8*)
- ILO 3: ethical, engaged citizenship (*Core Theme Goal 9 or Goal 10*)
- ILO 4: communication and collaboration (*Discipline Goal 1 and by any learning outcome(s) involving communication or collaboration*)

E. MAJOR CONTENT AREAS:

- Review of basic algebra
 - Integer and rational exponents
 - Radical notation
 - Factoring polynomial and fractional expressions
 - Mathematical models
- Review of equations and inequalities
 - Linear equations
 - Quadratic equations
 - Quadratic formula
 - Linear and non-linear inequalities
- Introduction to functions
 - Graphs of equations and functions
 - Graphing using transformations

- Function operations
- Inverse functions
- Mathematical modeling using regression
- Introduction to higher-order polynomial and rational functions
 - Quadratic functions
 - Polynomial division
 - Complex numbers
 - The fundamental theorem of algebra
 - Graphing rational functions
- Introduction to exponential and logarithmic functions
 - Exponential functions
 - Logarithmic functions
 - Mathematical models and regression
- Systems of equations and inequalities
 - Solving systems of equations of 3 variables
 - Graphing systems of inequalities

F. GOAL TYPES, OBJECTIVES, AND OUTCOMES:

<u>GOAL</u>	<u>OBJECTIVES</u>	<u>OUTCOMES</u>
<u>MnTC Goal 4a</u>	Students will be able to illustrate historical and contemporary applications of mathematical/logical systems.	The student will successfully <ol style="list-style-type: none"> 1. apply the properties of real numbers along with the systematic properties of algebra in such fields as science, business, statistics, and personal decision making.
<u>MnTC Goal 4c</u>	explain what constitutes a valid mathematical/logical argument (proof).	<ol style="list-style-type: none"> 1. use properties such as definitions, axioms, postulates, and theorems to generate equivalent equations until either the resulting equation provides a solution or until a contradiction is established.
<u>MnTC Goal 4d</u>	apply higher-order problem solving and/or modeling strategies.	<ol style="list-style-type: none"> 1. use regression analysis, synthetic division, quadratic methods and/or graphing calculators to solve applied problems.
<u>MnTC Goal 2a</u>	gather factual information and apply it to a given problem in a manner that is relevant, clear, comprehensive, and conscious of possible bias in the information selected.	<ol style="list-style-type: none"> 1. use graphs to make generalizations to assist in predicting the shape of other functions.
<u>MnTC Goal 2b</u>	imagine and seek out a variety of possible goals, assumptions, interpretations, or perspectives which can give alternative meanings or solutions to given situations or problems.	<ol style="list-style-type: none"> 1. use more than one method to solve similar problems or share methods used to interpret and solve application problems with other students.
<u>MnTC Goal 2c</u>	analyze the logical connections among the facts, goals, and implicit assumptions relevant to a problem or claim; generate and evaluate implications that follow from them.	<ol style="list-style-type: none"> 1. list the assumptions and limitations needed to accept a mathematical model.
<u>CS</u>	operate and reason within mathematical situations and contexts that are represented	<ol style="list-style-type: none"> 1. solve linear, quadratic, polynomial, radical, and rational equations and problems.

	through algebraic equations and inequalities.	
<u>CS</u>	demonstrate an understanding of the concepts of relations and functions through graphical representation.	<ol style="list-style-type: none"> graph linear, quadratic, polynomial, radical, and rational equations. interpret and analyze graphs.
<u>CS</u>	demonstrate mastery of a graphing calculator.	<ol style="list-style-type: none"> use a graphing calculator to graph, find regression equations, and solve problems.

G. SPECIAL INFORMATION:

This course may require use of the Internet, the submission of electronically prepared documents and the use of a course management software program. Students who have a disability and need accommodations should contact Accessibility Services at the beginning of the semester. This information will be made available in alternative format, such as Braille, large print, or current media, upon request. A graphing calculator is required.

H. COURSE CODING INFORMATION:

Course Code A/Class Maximum 48; Letter Grade

Revision date: 08/29/14; 09/01/16; 09/29/22; 03/14/23

AASC Approval date: 09/20/16; 02/19/19; 10/18/22; 03/28/23

*Riverland Community College Disciplines	MnTC Goal Number
Communication (CM)	1
Natural Sciences (NS)	3
Mathematics/Logical Reasoning (MA)	4
History and the Social & Behavioral Sciences (SS)	5
Humanities and Fine Arts (HU)	6

**Riverland Community College Core Themes	MnTC Goal Number
Critical Thinking (CT)	2
Human Diversity (HD)	7
Global Perspective (GP)	8
Ethical and Civic Responsibility (EC)	9
People and the Environment (PE)	10

*These five MnTC Goals have been identified as Riverland Community College Disciplines.

** These five MnTC Goals have been identified as Riverland Community College Core Themes.

NOTE: The Minnesota Transfer Curriculum “10 Goal Areas of Emphasis” are reflected in the five required discipline areas and five core themes noted in the Riverland Community College program of study guide and/or college catalog.