MASTER COURSE OUTLINE

A. MATH 1120 Trigonometry

B. COURSE DESCRIPTION:

This course builds on the computational, problem solving, and graphing skills learned in previous math courses. The topics covered in this course include trigonometric ratios, functions, graphs, identities, equations, inverse trigonometric functions, solution of the general triangle and other applications, conic sections, polar coordinates, and complex numbers. Prerequisite: Math 1110 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 2/CT); (4 Cr - 4 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:

- Introduction to trigonometric functions
  - Angle measure
  - Right triangle trigonometry
  - Unit circle
- Trigonometric graphs and models
  - Graphs of all six trigonometric functions
  - Transformations and applications of trigonometric graphs
  - Mathematical modeling
- Trigonometric identities
  - Fundamental identities
  - Constructing and verifying identities
  - Sum and difference identities
  - Double-angle, half-angle, and product-to-sum identities

- Inverse trigonometric functions and equations
    - Inverse trigonometric functions and applications
    - Graphing inverse trigonometric functions
    - Solving trigonometric equations

- Applications of trigonometry
    - Oblique triangles
    - Law of sines
    - Law of cosines
    - Vectors
    - Complex numbers
    - De Moivre's Theorem

- Conic Sections and Polar Coordinates
    - Circles
    - Ellipses
    - Hyperbolas
    - Polar coordinates, equations, and graphs

F. GOAL TYPES, OBJECTIVES, AND OUTCOMES:

GOAL	**OBJECTIVES** **Students will be able to**	**OUTCOMES** **The student will successfully**
MnTC Goal 4a	illustrate historical and contemporary applications of mathematical/logical systems.	1. apply properties of real numbers along with the systematic properties of algebra in such fields as science, business, statistics, and personal decision making.
MnTC Goal 4c	explain what constitutes a valid mathematical/logical argument (proof).	1. use properties of trigonometric functions to prove trigonometric identities.
MnTC Goal 4d	apply higher-order problem solving and/or modeling strategies.	1. use modeling strategies to solve applied problems.
MnTC Goal 2a	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.	1. analyze models created and determine which would be the most applicable to the situation.
MnTC Goal 2b	imagine and seek out a variety of possible goals, assumptions, interpretations, or perspectives which can give alternative meanings or solutions to the given situations or problems.	1. use alternate methods to prove the same trigonometric identities. 2. share methods used to interpret and solve application problems with other students.
MnTC Goal 2c	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.	1. list the assumptions and limitations needed to accept a mathematical model.
CS	demonstrate mastery of working with trigonometric functions.	1. recognize, graph, and analyze trigonometric functions. 2. solve trigonometric equations. 3. verify trigonometric identities. 4. use trigonometric functions to solve application 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: 09/22/10; 09/01/16; 04/04/18; 09/29/22; 03/14/23
AASC Approval date: 05/08/18; 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.