MASTER COURSE OUTLINE

A. PHYS 2202: Classical Physics II

B. COURSE DESCRIPTION:

This course is a continuation of PHYS 2201: Classical Physics I. The topics covered are heat, thermodynamics, electricity, magnetism, and optics. Prerequisites: PHYS 2201: Classical Physics I and MATH 1210 Calculus & Analytic Geometry I

MnTC (Goal 3/NS and 2/CT); (5 Cr – 4 lect, 1 lab)

C. *MnTC Discipline: Natural Sciences ** Core Theme: Critical Thinking

D. MAJOR CONTENT AREAS:

- Thermodynamics
  - laws of thermodynamics
  - heat engines
  - entropy
  - kinetic theory of gases
  - thermal expansion
  - specific heat, latent heat, heating curves
- Electricity
  - electric charges, electric forces, and electric fields
  - potential, resistance, current
  - DC circuits
  - Kirchhoff's rules
- Magnetism
  - magnets, magnetic forces, magnetic fields
  - electric currents and magnetic fields
  - electromagnetic induction
- Optics

E. GOAL TYPES, OBJECTIVES, AND OUTCOMES:

GOAL	**OBJECTIVES** **Students will be able to**	**OUTCOMES** **The student will successfully**
MnTC Goal 3a	demonstrate understanding of scientific theories.	1. demonstrate an understanding of physics theories related to thermodynamics, electricity &

		magnetism, and optics. 2. apply physics theories to everyday physical phenomena.
MnTC Goal 3c	communicate their experimental findings, analyses and interpretations both orally and in writing.	1. perform physics experiments. 2. record, analyze, and draw conclusions from the data generated in the experiments. 3. communicate the experimental findings.
MnTC Goal 3d	evaluate societal issues from a natural science perspective, ask questions about the evidence presented and make informed judgments about science-related topics and policies.	1. identify science-related questions and make judgments on physics-related issues.
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. report on experimental data in laboratory experiments and draw conclusions based on interpretations of data. 2. use statistical analysis in the interpretation of data and identify sources of error in data-taking procedures. 3. demonstrate the ability to apply physics principles to explain everyday physical phenomenon.
MnTC Goal 2b	imagine and seek out a variety of possible goals, assumptions, interpretations and perspectives, which can give alternate meanings or solutions to given situations or problems.	1. apply 'limits/special cases' in solving a physics problem. 2. demonstrate how alternate assumptions can lead to alternate solution to the same problem.-
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. solve physics problems that required logical connection between facts and assumptions pertaining to those problems. 2. be able to pick the relevant formulas that apply to a situation or problem. 3. draw conclusions based on the solutions to problems.
CS	apply calculus concepts to solve physics problems	1. use differential and integral calculus to solve physics problems.
CS	demonstrate an understanding of the first and second laws of thermodynamics.	1. apply the first and second laws of thermodynamics to heat engines, including Carnot engines.
CS	demonstrate an understanding of the field concept as applied to electromagnetism	1. apply the concept of electric fields and magnetic fields to solve electromagnetism problems.
CS	demonstrate an understanding of the relationships between potential, current, resistance, and power in direct current	1. solve physics problems for DC circuits involving combinations of resistors and capacitors in

	circuits.	series and parallel. 2. apply Kirchhoff's rules to analyze complex DC circuits.

F. 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 the instructor or the Student Success Center at the beginning of the semester. This information will be made available in alternative format, such as Braille, large print, or cassette tape, upon request.

G. COURSE CODING INFORMATION:

Course Code C/Class Maximum 48; Letter Grade

Revision date: 12/17/2019
AASC Approval date: 1/28/2020

***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.