



MASTER COURSE OUTLINE

A. PHYS 1502 College Physics II

B. COURSE DESCRIPTION:

This course is a continuation of PHYS 1501: College Physics I. The topics covered are thermodynamics, electricity, magnetism, and optics. Prerequisite: PHYS 1501.

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

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

D. MAJOR CONTENT AREAS:

- Thermodynamics
 - first and second laws
 - heat engines
 - 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
- Magnetism
 - magnets, magnetic forces, magnetic fields
 - electric currents and magnetic fields
- Optics
 - geometric optics

E. GOAL TYPES, OBJECTIVES, AND OUTCOMES:

<u>GOAL</u>	<u>OBJECTIVES</u>	<u>OUTCOMES</u>
<u>MnTC Goal 3a</u>	Students will be able to demonstrate understanding of scientific theories.	The student will successfully 1. demonstrate an understanding of various physics theories related to thermodynamics, electricity & magnetism, and optics. 2. apply physics theories to real-life physics problems.

<u>MnTC Goal 3c</u>	communicate their experimental findings, analyses and interpretations both orally and in writing.	<ol style="list-style-type: none"> 1. perform physics experiments. 2. record, analyze, and draw conclusions from the data generated in the experiments. 3. communicate the experimental findings.
<u>MnTC Goal 3d</u>	evaluate societal issues from a natural science perspective, ask questions about the evidence presented and make informed judgments about science-related topics and policies.	<ol style="list-style-type: none"> 1. formulate questions and make judgments on physics-related issues.
<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. 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.
<u>MnTC Goal 2b</u>	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.	<ol style="list-style-type: none"> 1. apply 'limits/special cases' in solving a physics problem. 2. demonstrate how alternate assumptions can lead to alternate solution to the same problem.
<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. 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.
<u>CS</u>	demonstrate an understanding of kinetic theory.	<ol style="list-style-type: none"> 1. explain how the microscopic properties of gas particles relate to their macroscopic behavior.
<u>CS</u>	demonstrate an understanding of the first and second laws of thermodynamics.	<ol style="list-style-type: none"> 1. apply the first and second laws of thermodynamics to heat engines, including Carnot engines.
<u>CS</u>	demonstrate an understanding of the relationships between potential, current, resistance, and power in direct current circuits.	<ol style="list-style-type: none"> 1. solve physics problems for DC circuits involving combinations of resistors in series and parallel. 2. apply Kirchhoff's rules to analyze complex DC circuits.
<u>CS</u>	demonstrate an understanding of geometric optics.	<ol style="list-style-type: none"> 1. given an object's position and size, determine the position and size of its image for various combinations of mirrors and lenses.

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 current media, upon request.

G. COURSE CODING INFORMATION: Course Code C/Class Maximum 48; Letter Grade

Revision date: 10/12/10; 4/17/18

AASC Approval date: 05/08/18 ; 12/17/19

*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.