MASTER COURSE OUTLINE

A. CHEM 2127 Organic Chemistry I

B. COURSE DESCRIPTION:

Introduction to organic nomenclature, structure, bonding, chemical reactivity, organic acid-base reactions, mechanisms and stereochemistry. Infrared Spectroscopy (IR) and Nuclear Magnetic Resonance (NMR) spectroscopy will be introduced. The chemistry of alkanes, alkyl halides, alkenes, alkynes, and alcohols will be covered. Laboratory illustrates synthetic techniques and the preparation and reactions of functional groups discussed during lecture. Prerequisite: CHEM 1202, "C" (2.0) or higher.
(4 Cr – 3 lect, 1 lab)

C. **Core Theme: Critical Thinking

D. RIVERLAND INSTITUTIONAL LEARNING OUTCOMES

This course addressed 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:
- Structure of organic molecules
- Organic nomenclature
- Representation of structure and reactions
- Isomers
- Properties of organic molecules
- Organic Reactions

F. GOAL TYPE, OBJECTIVES, AND OUTCOMES:

GOAL TYPE	**OBJECTIVES** **Students will be able to**	**OUTCOMES** **The student will successfully**
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. research and complete an analysis of scientific findings in an area of organic chemistry as defined by the instructor. 2. include summary of the findings and any sources of error, bias or

		uncertainty in the evidence evaluated for the analysis above.
CS	demonstrate an understanding of properties of organic molecules.	1. predict properties and reactivity of organic molecules using concepts of molecular structure, formal charge, and resonance. 2. analyze the relative energies of molecular structures. 3. correlate physical properties with functional group structure.
CS	demonstrate an understanding of properties of organic nomenclature and structure.	1. translate between compound names and representations of structure. 2. identify various functional groups within complex molecules.
CS	demonstrate an understanding of isomers.	1. create and employ 3-dimensional structures to determine the constitutional and stereo chemical isomeric relationships between molecules.
CS	demonstrate an understanding of organic reactions	1. predict relevant reactions each functional group will undergo. 2. predict the products of acid-base, substitution, elimination, and addition reactions through the application of thermodynamic and kinetic principles. 3. create logical synthetic strategies by combining reactions into practical multi-step sequences. 4. propose reaction mechanisms using the curved-arrow formalism.
CS	demonstrate an understanding of analytical techniques	1. employ data from IR and NMR spectroscopy to identify organic compounds and develop an understanding of how each of these analytical techniques work.
CS	demonstrate an understanding of laboratory techniques	1. plan organic chemical reactions using proper reaction stoichiometry calculations. 2. perform successful organic chemical reactions with hands-on use of reaction glassware and equipment, practicing proper laboratory technique to maximize product yield and purity. 3. separate and purify chemical compounds. 4. determine the identity of organic samples through physical and spectroscopic methods. 5. determine the qualitative and quantitative purity of organic samples through physical and spectroscopic methods. 6. model the scientific method by performing inquiry- or research-based laboratory experiments or projects in which the student makes decisions regarding experimental design and execution.

		7. demonstrate responsible laboratory safety and waste handling practices including the use of proper fume hoods or fume extraction for chemicals that emit hazardous vapors. 8. communicate the procedure, results, and relative success of an experiment with respect to the experimental objectives in the form of a laboratory notebook, written reports, or verbal presentation.

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 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.

H. COURSE CODING INFORMATION: Course Code C/B; Class Maximum 48/24; Letter Grade

Revision date: 2/24/22
AASC Approval date: 3/6/18; 4/19/22

***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.