



## MASTER COURSE OUTLINE

### A. BIOL 1091 General Biology I

### B. COURSE DESCRIPTION:

This course is the first semester of a two-semester course sequence in general biology. Topics include the scientific method, characteristics of life, biological chemistry, cell and membrane structure and function, enzymes, metabolism, mitosis, meiosis, genetics, the structure of DNA, and protein synthesis. This course includes laboratory exercises and experimentation that illustrate core principles covered in the course. Prerequisite or co-requisite: CHEM 1121 or 1201 or 1210

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

### C. \*MnTC Discipline: Natural Sciences \*\*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 the science of biology and evolution as a unifying concept
- Scientific method and hypothesis testing
- Biological chemistry and the chemistry of water
- Carbon and the structure of macromolecules
- Metabolism and enzymes
- Cell theory
- Prokaryotic and eukaryotic cells
- Cell structure and function
- Cellular respiration and photosynthesis
- Cell division and control
- Genetics and inheritance
- Genetics: replication, transcription, translation/protein synthesis
- Molecular genetics

F. GOAL TYPES, OBJECTIVES, AND OUTCOMES:

<u>GOAL TYPE</u>	<u>OBJECTIVES</u>	<u>OUTCOMES</u>
<u>MnTC Goal 3a</u>	<b>Students will be able to:</b> demonstrate an understanding of scientific theories.	<b>The student will successfully:</b> <ol style="list-style-type: none"> <li>1. explain the history and methods of science including the scientific method.</li> <li>2. develop a hypothesis, design an experiment to test the hypothesis, perform or simulate data collection and draw a conclusion from the data.</li> <li>3. compare and explain scientific observation vs. non-scientific observation and the differences between scientific theories, facts and principles and non- scientific use of those terms.</li> <li>4. explain the limits, validity and application of the scientific method.</li> </ol>
<u>MnTC Goal 3b</u>	formulate and test hypotheses by performing laboratory, simulation or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students' laboratory experience in the collection of data, its statistical and graphical analysis and an appreciation of its sources of error and uncertainty.	<ol style="list-style-type: none"> <li>1. conduct research and present the compiled information.</li> <li>2. explain how data is collected, recorded and analyzed.</li> <li>3. identify the sources of uncertainty and error in relationship to that data.</li> </ol>
<u>MnTC Goal 3c</u>	communicate their experimental findings, analyses and interpretations both orally and in writing.	<ol style="list-style-type: none"> <li>1. discuss experimental findings in oral and written formats.</li> </ol>
<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"> <li>1. complete an analysis of scientific findings relevant to general biology.</li> <li>2. summarize the findings, explain the context of the findings, and the sources of error and/or bias or uncertainty in the evidence evaluated in the analysis above.</li> </ol>
<u>MnTC Goal 2b</u>	imagine and seek out a variety of possible goals, assumption, interpretations or perspectives which can give alternative meanings or solutions to a given situation or problem.	<ol style="list-style-type: none"> <li>1. arrive at "working" assumptions and seek alternative explanations for experimental results.</li> <li>2. present data to support or contradict their hypothesis after the conclusion of experimentation.</li> </ol>
<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"> <li>1. explain the implicit assumptions and the subsequent decision-making options relative to the activity specified in the outcomes for MnTC Goals 3b and 3c.</li> </ol>
<u>CS</u>	safely and properly use the microscope and other laboratory equipment/facilities.	<ol style="list-style-type: none"> <li>1. demonstrate their proficiency with these tools during scheduled laboratory meetings.</li> </ol>

<u>CS</u>	utilize analytical tools to gather the biologically relevant data necessary to test hypotheses and come to logical conclusions.	<ol style="list-style-type: none"> <li>1. demonstrate the use of any combination of analytical tools/sensors/microscope in gathering data.</li> <li>2. draw conclusions based on data analysis, and demonstrated through class discussions and/or written laboratory reports.</li> </ol>
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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.

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

Revision date: 02/01/18; 09/06/22

AASC Approval date: 02/20/18; 5/08/2020; 09/20/22

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

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

\*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.