

## WTCS Repository

10-806-114 General Biology

# Course Outcome Summary

### Course Information

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|  | Description | This course introduces general biological concepts and principles.  It emphasizes cell structure and function, genetics, evolution, taxonomical relationships, and the diversity of life. |
|  | Total Credits | 4 |

Pre/Corequisites

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| Prerequisite | Each Wisconsin Technical College determines the General Education course prerequisites used by their academic institution. If prerequisites for a course are determined to be appropriate, the final Course Outcome Summary must identify the prerequisites approved for use by the individual Technical College. |

### Course Competencies

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| 1. | Investigate the characteristics of living things | |
|  | Assessment Strategies | |
|  | 1.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria | |
|  | 1.1. | list properties of living things |
|  | 1.2. | distinguish between growth, development, and reproduction |
|  | 1.3. | define homeostasis and identify examples |
|  | 1.4. | differentiate the levels of biological hierarchy from atom to biosphere |
|  | 1.5. | discuss how living things respond to stimuli |
| 2. | Apply the scientific method to biological sciences | |
|  | Assessment Strategies | |
|  | 2.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria | |
|  | 2.1. | list the steps used in the scientific process |
|  | 2.2. | develop an example utilizing the scientific method |
|  | 2.3. | utilize inductive and deductive logic in the scientific method |
|  | 2.4. | differentiate among the terms hypothesis, observation, theory, and law |
| 3. | Apply general chemistry concepts to biology | |
|  | Assessment Strategies | |
|  | 3.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria | |
|  | 3.1. | define matter, energy, and force |
|  | 3.2. | identify bond types: covalent, ionic, and hydrogen (proton) bonds |
|  | 3.3. | define the characteristics of water |
|  | 3.4. | discuss acid-base balance |
|  | 3.5. | discover the nature of buffers |
| 4. | Examine biological macromolecules | |
|  | Assessment Strategies | |
|  | 4.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria | |
|  | 4.1. | describe the nature of synthetic and hydrolytic reactions |
|  | 4.2. | describe the structure and function of carbohydrates |
|  | 4.3. | describe the structure and function of lipids |
|  | 4.4. | describe the structure and function of proteins |
|  | 4.5. | describe the structure and function of nucleic acids |
| 5. | Explore the basic taxonomic relationships of living things | |
|  | Assessment Strategies | |
|  | 5.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria | |
|  | 5.1. | identify the levels of classification in the Linnaean taxonomic system |
|  | 5.2. | differentiate among the three domains |
|  | 5.3. | differentiate between scientific and common names |
|  | 5.4. | classify an organism into the proper hierarchy |
|  | 5.5. | relate the natural habitat of various taxa to organism function |
| 6. | Examine the components of cell structure, function, tissue, and transport mechanisms | |
|  | Assessment Strategies | |
|  | 6.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria | |
|  | 6.1. | identify major cell structures |
|  | 6.2. | link the cell structures with the function of the organelles |
|  | 6.3. | identify the components of the cell membrane |
|  | 6.4. | describe the processes that move the materials across cell membrane |
|  | 6.5. | summarize the specialization of cells and tissues |
| 7. | Compare the prokaryotes and eukaryotes | |
|  | Assessment Strategies | |
|  | 7.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria | |
|  | 7.1. | define the terms prokaryotes and eukaryotes |
|  | 7.2. | identify the unique structural differences between prokaryotes and eukaryotes |
|  | 7.3. | differentiate among prokaryotes, eukaryotes, viruses, and prions |
| 8. | Examine the concepts of evolution | |
|  | Assessment Strategies | |
|  | 8.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria | |
|  | 8.1. | examine the historical basis of evolutionary theories |
|  | 8.2. | relate current topics in molecular genetics to current evolutionary principles |
|  | 8.3. | explain adaptions that benefit specific organisms |
|  | 8.4. | describe the causes and consequences of evolutionary trends |
|  | 8.5. | describe the major mechanisms of evolution |
|  | 8.6. | explain the different types of evidence for evolution |
|  | 8.7. | relate the concepts of evolution to ecology |
| 9. | Analyze the concepts of cellular metabolism | |
|  | Assessment Strategies | |
|  | 9.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria | |
|  | 9.1. | describe anabolic and catabolic processes in the cell |
|  | 9.2. | discuss the process of enzymatic reactions and their role in metabolic pathways |
|  | 9.3. | identify the factors that affect enzyme activity |
|  | 9.4. | identify the basic steps in aerobic, anaerobic, and photosynthesis reactions |
| 10. | Examine the cell cycle including mitosis and meiosis | |
|  | Assessment Strategies | |
|  | 10.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria | |
|  | 10.1. | relate the cell cycle to growth, metabolism, and formation of gametes |
|  | 10.2. | examine the replication processes of mitosis and meiosis |
|  | 10.3. | relate the process of independent assortment to meiosis |
| 11. | Investigate heredity | |
|  | Assessment Strategies | |
|  | 11.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria | |
|  | 11.1. | describe Mendelian genetics |
|  | 11.2. | relate the function of mutation in biologic diversity |
|  | 11.3. | describe Non-Mendelian patterns of inheritance |
|  | 11.4. | correlate chromosomal abnormalities and genetic mutations with their associated disorders |
| 12. | Investigate molecular genetics | |
|  | Assessment Strategies | |
|  | 12.1. | Oral, Written, Graphic and/or Skill Assessment |
|  | Criteria | |
|  | 12.1. | describe the central dogma of biology and organize into a historical perspective |
|  | 12.2. | contrast DNA and RNA |
|  | 12.3. | describe the processes of replication, transcription, and translation |