

WTCS Repository

10-806-186 Intro to Biochemistry

Course Outcome Summary

Course Information

Description Provides students with skills and knowledge of organic and biological chemistry necessary for application within Nursing and other Allied Health careers. Emphasis is placed on recognizing the structure, physical properties and chemical reactions of organic molecules, body fluids, and acids. Additional emphasis is placed on biological functions and their relationships to enzymes, proteins, lipids, carbohydrates and DNA.

Total Credits 4.00

Pre/Corequisites

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

1. Use appropriate scientific equipment, methods, and safety precautions

Assessment Strategies

1.1. in the laboratory

Criteria

Performance will be successful when:

- 1.1. you identify hazards and safety equipment in the chemistry lab
- 1.2. you use appropriate personal protective equipment
- 1.3. you follow all laboratory practice expectations within your college

2. Predict the effects of pH on biochemical reactions and its role in homeostasis

Assessment Strategies

- 2.1. through a graphic, written or oral product or process
- 2.2. in a laboratory or classroom setting

Criteria

Your performance will be successful when:

- 2.1. graphic, written or oral product or process describes the function of a bicarbonate buffer in the blood
- 2.2. graphic, written or oral product or process relates the pH to the hydronium and hydroxide ion concentration
- 2.3. graphic, written or oral product or process predicts effects of pH on chemical structure and solubility

3. Summarize the structure, physical properties, and chemical reactions of hydrocarbons

Assessment Strategies

- 3.1. through a graphic, written or oral product or process
- 3.2. in a laboratory or classroom setting

Criteria

Your performance will be successful when:

- 3.1. graphic, written or oral product or process determines names for hydrocarbons
- 3.2. graphic, written or oral product or process determines structure from common name
- 3.3. graphic, written or oral product or process classifies hydrocarbons by family
- 3.4. graphic, written or oral product or process characterizes the physical properties
- 3.5. graphic, written or oral product or process converts between condensed and expanded structural formulas
- 3.6. graphic, written or oral product or process predicts the product of common reactions
- 3.7. graphic, written or oral product or process recognizes geometric and structural isomers

4. Summarize the structure, physical properties and chemical reactions of amines, carboxylic acids and their derivatives

Assessment Strategies

- 4.1. through a graphic, written or oral product or process
- 4.2. in a laboratory or classroom setting

Criteria

Your performance will be successful when:

- 4.1. graphic, written or oral product or process determines structure from common name
- 4.2. graphic, written or oral product or process classifies according to functional group
- 4.3. graphic, written or oral product or process characterizes physical properties
- 4.4. graphic, written or oral product or process converts between condensed and expanded structural formulas
- 4.5. graphic, written or oral product or process predicts the product of common reactions
- 4.6. graphic, written or oral product or process relates each to biological significance

5. Summarize the structure, physical and chemical properties of alcohols, ethers, thiols, aldehydes, and ketones

Assessment Strategies

- 5.1. through a graphic, written or oral product or process
- 5.2. in a laboratory or classroom setting

Criteria

Your performance will be successful when:

- 5.1. graphic, written or oral product or process determines structure from common name
- 5.2. graphic, written or oral product or process classifies according to functional group
- 5.3. graphic, written or oral product or process characterizes the physical properties
- 5.4. graphic, written or oral product or process converts between condensed and expanded structural formulas
- 5.5. graphic, written or oral product or process predicts the product of common reactions
- 5.6. graphic, written or oral product or process each to biological significance

6. Correlate the molecular structure and function of proteins to their roles in biological systems

Assessment Strategies

- 6.1. through a graphic, written or oral product or process
- 6.2. in a laboratory or classroom setting

Criteria

Your performance will be successful when:

- 6.1. graphic, written or oral product or process illustrates the structure of a given written, graphic or oral peptide
- 6.2. graphic, written or oral product or process explains the four levels of protein structure and the types of interactions responsible for each level
- 6.3. graphic, written or oral product or process explains the causes and mechanisms of protein denaturation
- 6.4. graphic, written or oral product or process relates the structure of a protein to its function
- 6.5. graphic, written or oral product or process identifies the roles of selected proteins
- 6.6. graphic, written or oral product or process identifies chiral carbons
- 6.7. graphic, written or oral product or process recognizes the biological significance of chirality

7. Correlate the structure of enzymes to their biological function

Assessment Strategies

- 7.1. through a graphic, written or oral product or process
- 7.2. in a laboratory or classroom setting

Criteria

Your performance will be successful when:

- 7.1. graphic, written or oral product or process contrasts the characteristics of enzymes versus inorganic catalysts
- 7.2. graphic, written or oral product or process recognizes factors that affect enzyme activity
- 7.3. graphic, written or oral product or process describes the role of cofactors, vitamins and coenzymes in enzyme function
- 7.4. graphic, written or oral product or process explains mechanisms of enzyme regulation
- 7.5. graphic, written or oral product or process gives examples of how selected enzymes can be used in medical diagnosis
- 7.6. graphic, written or oral product or process recognizes the biological significance of chirality

8. Correlate the structure to the functions of key carbohydrates

Assessment Strategies

- 8.1. through a graphic, written or oral product or process
- 8.2. in a laboratory or classroom setting

Criteria

Your performance will be successful when:

- 8.1. graphic, written or oral product or process discriminates among common carbohydrates
- 8.2. graphic, written or oral product or process relates the structural differences to the biological significance of selected carbohydrates
- 8.3. graphic, written or oral product or process illustrates the common reactions of carbohydrates
- 8.4. graphic, written or oral product or process recognizes the biological significance of chirality

9. Correlate the structure to the functions of key lipids

Assessment Strategies

- 9.1. through a graphic, written or oral product or process
- 9.2. in a laboratory or classroom setting

Criteria

Your performance will be successful when:

- 9.1. graphic, written or oral product or process discriminates among common lipids
- 9.2. graphic, written or oral product or process relates the structural differences to the biological significance of selected lipids
- 9.3. graphic, written or oral product or process illustrates the common reactions of lipids
- 9.4. graphic, written or oral product or process discusses the structure and function of cellular membranes

10. Examine carbohydrate metabolism

Assessment Strategies

- 10.1. through a graphic, written or oral product or process
- 10.2. in a laboratory or classroom setting

Criteria

Your performance will be successful when:

- 10.1. graphic, written or oral product or process identifies the major incoming and outgoing metabolites of aerobic and anaerobic glycolysis, Krebs Cycle (citric acid), and electron transport and oxidative phosphorylation
- 10.2. graphic, written or oral product or process discusses the impact of diabetes on metabolism
- 10.3. graphic, written or oral product or process compares energy yield of various metabolic pathways
- 10.4. graphic, written or oral product or process explains how oxidation and reduction are involved in metabolism
- 10.5. graphic, written or oral product or process identifies key precursors of carbohydrates
- 10.6. graphic, written or oral product or process contrasts the general characteristics of catabolism and anabolism

11. Examine protein and lipid metabolism

Assessment Strategies

- 11.1. through a graphic, written or oral product or process
- 11.2. in a laboratory or classroom setting

Criteria

Your performance will be successful when:

- 11.1. graphic, written or oral product or process identifies major incoming and outgoing metabolites of fatty acid oxidation
- 11.2. graphic, written or oral product or process identifies major incoming and outgoing metabolites of the urea cycle
- 11.3. graphic, written or oral product or process identifies key precursors of proteins and lipids
- 11.4. graphic, written or oral product or process compares energy yield of various metabolic pathways
- 11.5. graphic, written or oral product or process explains how oxidation and reduction are involved in metabolism
- 11.6. graphic, written or oral product or process discusses the impact of diabetes on metabolism

12. Correlate the molecular structure and function of DNA and RNA to their roles in biological systems

Assessment Strategies

- 12.1. through a graphic, written or oral product or process
- 12.2. in a laboratory or classroom setting

Criteria

Your performance will be successful when:

- 12.1. graphic, written or oral product or process shows correlation between structure of DNA and RNA
- 12.2. graphic, written or oral product or process describes the roles of the various RNA molecules in protein synthesis
- 12.3. graphic, written or oral product or process explains the process of basic DNA replication
- 12.4. graphic, written or oral product or process discusses the biological significance of RNA and DNA