

Warren County School District
PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: Advanced Organic Chemistry - Honors

Course Number: 00334

Course Prerequisites: Completion of Academic Chemistry with an 80% average or higher or permission of the principal.

Course Description:

This honors course deals with concepts of molecular structure, atomic and intermolecular bonding and the resulting properties of organic compounds. An emphasis is placed on the recognition and classification of major functional groups and the nomenclature and structure of organic molecules. Additional concepts include chemical and physical properties as a function of molecular mass, structural arrangement and intermolecular forces, isomers, reactions, reaction mechanisms, and synthesis/preparation of organic compounds.

Suggested Grade Level: Grades 11-12

Length of Course: ☒ One Semester ☐ Two Semesters ☐ Other (Describe)

Units of Credit: .5 (Insert *None* if appropriate)

PDE Certification and Staffing Policies and Guidelines (CSPG) Required Teacher Certifications:
CSPG 34 Chemistry

Certification verified by WCSD Human Resources Department: ☒ Yes ☐ No

TEXTBOOK AND SUPPLEMENTAL MATERIALS

Continue using Board approved textbook? ☒ Yes ☐ No (*If yes, then complete the information below.*)

Board Approved Textbooks, Software, Supplemental Materials:

Title: Organic Chemistry 9th edition

Publisher: Pearson

ISBN #: 9780134160498

Copyright Date: 2017

Date of WCSD Board Approval: _____

BOARD APPROVAL: _____

Date Written: 2/28/18

Date Approved: _____

Implementation Date: 2018-2019

SPECIAL EDUCATION AND GIFTED REQUIREMENTS

The teacher shall make appropriate modification to instruction and assessment based on a student's Individual Education Plan (IEP) or Gifted Individual Education Plan (GIEP).

COURSE OVERVIEW

Course Standards

PA Academic Standards:

3.1.C.A: CHEMISTRY
3.1.C.B: CHEMISTRY
3.1.C.C: CHEMISTRY
3.2.C.A: CHEMISTRY
3.2.C.B: CHEMISTRY
3.3.C.A: CHEMISTRY
3.3.C.B: CHEMISTRY

Common Core Standards:

CC.3.5.11-12 Reading Informational Text
CC.3.6.11-12 Writing

REQUIRED COURSE SEQUENCE

(Content must be tied to objectives)

Content Sequence

- I. Review of Chemical Bonding
 - A. Create Lewis Dot structures for ionic and covalent compounds.
 - B. Using Lewis Dot structures, determine molecular geometry and hybridization of covalent compounds.
 - C. Differentiate between sigma and pi bonds and demonstrate the formation of these bonds.
- II. Introduction to Organic Chemistry
 - A. Describe the differences between organic and inorganic compounds.
 - B. Describe the different types of isomerism including structural, positional, and functional.
 - C. Identify compounds that are isomers and classify the type of isomerism exhibited.
 - D. Laboratory activity: Model building. (*suggested*)
- III. Chemistry of hydrocarbons including alkanes, alkenes, alkynes, aromatic compounds, monomers/polymers.
 - A. Nomenclature
 - 1. Given a structural formula, name the compound.
 - 2. Given a name, draw the structural formula.
 - B. Physical properties of hydrocarbons
 - 1. Using structural formulas, determine relative melting points, boiling points, and

- solubility from a group of hydrocarbons.
 - 2. Demonstrate how the structure of a compound affects the physical properties.
- C. Chemical properties of hydrocarbons
 - 1. Describe preparations methods and write the chemical equations for the synthesis of various hydrocarbons.
 - 2. Describe basic reactions of hydrocarbons and write the chemical equations for these reactions.
 - 3. Show simple synthesis reactions involving hydrocarbons.
- D. Laboratory activity: chemical and physical properties of hydrocarbons.
- IV. Chemistry of Functional Derivatives including alkyl halides, alcohols, ethers, aldehydes, ketones, carboxylic acids, carboxylic acid derivatives.
 - A. Identify the various functional groups.
 - B. Nomenclature
 - 1. Given a structural formula, name the compound.
 - 2. Given a name, draw the structural formula.
 - C. Physical properties of functional derivatives.
 - 1. Using structural formulas, determine relative melting points, boiling points, and solubility from a group of hydrocarbons.
 - 2. Demonstrate how the structure of a compound affects the physical properties.
 - D. Chemical properties of functional derivatives.
 - 1. Describe preparations methods and write the chemical equations for the synthesis of various functional derivatives.
 - 2. Describe basic reactions of functional derivative groups and write the chemical equations for these reactions.
 - E. Formulate complex multi-step synthesis using all reactions and preparations learned throughout the course.

Laboratory Investigations: Each unit should include at least one lab used to aid in the understanding of the lecture material. Laboratory Activities (*suggested*)

- 1. Physical and chemical properties of functional derivatives.
- 2. Preparation of esters.
- 3. Preparation of aspirin.

Objectives:

- 1. Evaluate scientific processes by collecting data and applying knowledge to physical models to interpret data.
- 2. Assess and apply patterns in organic nomenclature and reactions.
- 3. Evaluate data correctly to form conclusions.
- 4. Characterize and identify organic compounds and reactions.

ASSESSMENT

Portfolio Assessment: ☐ Yes ☒ No

District-Wide Common Final Examination Required: ☒ Yes ☐ No

Course Challenge Assessment (Describe): Must pass final examination with an 80% or better

WCSD STUDENT DATA SYSTEM INFORMATION

1. Is there a required final examination? ☒ Yes ☐ No

**Warren County School District Policy 9741 and 9744 state, "All classes in grades 9-12 shall have a final exam."*

2. Does this course issue a mark/grade for the report card? ☒ Yes ☐ No

3. Does this course issue a Pass/Fail mark? ☐ Yes ☒ No

4. Is the course mark/grade part of the GPA calculation? ☒ Yes ☐ No

5. Is the course eligible for Honor Roll calculation? ☒ Yes ☐ No

6. What is the academic weight of the course?

☐ No weight/Non credit

☐ Standard weight

☒ Enhanced weight