



North Central State College  
MASTER SYLLABUS  
2019-2020

- A. Academic Division: Health Sciences
- B. Discipline: Science
- C. Course Number and Title: CHEM1030 Chemistry
- D. Course Coordinator:  
Assistant Dean: Melinda Roepke, MSN, RN
- Instructor Information:
- Name: [Click here to enter text.](#)
  - Office Location: [Click here to enter text.](#)
  - Office Hours: [Click here to enter text.](#)
  - Phone Number: [Click here to enter text.](#)
  - E-Mail Address: [Click here to enter text.](#)
- E. Credit Hours: 3  
Lecture: 2 hours  
Laboratory: 3 hours
- F. Prerequisites: High school chemistry (minimum grade of C- required) or CHEM1010 (minimum grade of C- required) and completion of MATH0084 with minimum grade of C- qualifying math placement score
- G. Syllabus Effective Date: Fall, 2019
- H. Textbook(s) Title:  
*General, Organic, and Biological Chemistry*
- Author: Frost/Deal
  - Copyright Year: 2017
  - Edition: 3<sup>rd</sup>
  - ISBN: 9780134183794
- I. Workbook(s) and/or Lab Manual: None
- J. Course Description: The course is to give the Allied Health and Nursing student an appreciation and understanding of general inorganic chemistry. Includes atomic and molecular structure, molecular forces, properties and states of matter, naming of chemical compounds, types and behaviors of solutions, types of reactions, acid base chemistry, carefully chosen organic topics with their applications to specific health problems. Laboratory exercises will enhance and reinforce lecture topics. (OTM for Natural Sciences TMNS)

K. College-Wide Learning Outcomes

College-Wide Learning Outcomes	Assessments - - How it is met & When it is met
Communication – Written	
Communication – Speech	
Intercultural Knowledge and Competence	
Critical Thinking	
Information Literacy	
Quantitative Literacy	

L. Course Outcomes and Assessment Methods:

Upon successful completion of this course, the student shall:

Outcomes	Assessments – How it is met & When it is met
1. Use and apply the units of the metric system, demonstrate the ability to develop the correct conversion factor to solve dimensional analysis problems	quizzes, laboratory exercises, worksheets, exam 1, final, met at end of semester
2. Predict the chemical behavior of the 1 <sup>st</sup> 30 elements by their arrangement on the periodic table, Compare the characteristics of the subatomic particles making use of the periodic table	quizzes, laboratory exercises, worksheets, exam 1, final, met at end of semester
3. Given the various elements predict the way compounds will form and be able to write the name and write the formula Identify the forces involved in compound formation	quizzes, laboratory exercises, worksheets, exam 1, final, met at end of semester
4. Distinguish between the basic chemical reactions and demonstrate how to balance chemical reactions and determine stoichiometric ratios.	quizzes, laboratory exercises, worksheets, exam 1, final, met at end of semester
5. Be able to compare and contrast the differences between the states of matter how changes of state occur, and energy balances involved in these changes. Solve problems involving heat of fusion and heat of vaporization of water	quizzes, laboratory exercises, worksheets, exam 1, final, met at end of semester
6. Apply the Kinetic Molecular Theory of Gasses to analyze the behavior of gasses, explain the difference between directly and indirectly proportional gas property behaviors, choose the appropriate gas law to solve a problem	quizzes, laboratory exercises, worksheets, exam 1, final, met at end of semester
7. Describe the nature of aqueous solutions, how they are prepared, and their characteristics, predict their behavior upon erythrocytes	quizzes, laboratory exercises, worksheets, exam 2, final, met at end of semester
8. Categorize the properties of a solution and distinguish between various types of solutions demonstrate the ability to perform calculations involving concentrations	quizzes, laboratory exercises, worksheets, exam 2, final, met at end of semester
9. Be able to classify the differences between acids and bases, given the molarity of an acid or base calculate the pH, predict the results of an acid -base reaction, understand the bicarbonate blood buffering system, from given blood results be able to tell patient's acid- base status	quizzes, laboratory exercises, worksheets, final, met at end of semester

Outcomes	Assessments – How it is met & When it is met
10. Explain chirality ,D and L isomers and their effects on the behavior and of amino acids ,sugars, predict how cis and trans isomers affect fatty acid behavior, explain the effects of hydrogen bonding on DNA function, understand the structure of proteins, explain the similarities and differences between steroid hormones, identify the central functional area of a drug   Introductory Naming of organic compounds	quizzes, laboratory exercises, worksheets, final, met at end of semester
11. Current issues in chemistry will be discussed.	Throughout the semester.
12. Have completed laboratory experiments that test basic chemistry principles adapted from corresponding lecture topics	laboratory exercises, exams, final, met at end of semester

M. Topical Timeline (Subject to Change):

Apply the concepts and solve problems in the following areas,

1. Units of measurement: metric system: prefixes and equalities, writing conversion factors, problem solving, scientific notation, density
2. Energy and matter: energy and nutrition, temperature conversions, states of matter, changes of state
3. Atoms and elements: classification of matter, elements and symbols, periodic table , the atom, atomic number and mass number , isotopes and atomic mass, electron energy levels, periodic trends
4. Compounds and their bonds: octet rule and ions, ionic compounds , naming and writing ionic formulas , polyatomic ions , covalent compounds, sp orbital hybridization, electro-negativity and bond polarity, shapes and polarity of molecules, chiral molecules, *cis* and *trans* isomers, D and L isomers, attractive forces in compounds
5. Chemical quantities and reactions: the mole, molar mass , chemical changes, chemical equations, types of reactions, oxidation–reduction reactions of inorganic chemistry and physiology, mole relationships in chemical equations, mass calculations for reactions, energy in chemical reactions
6. Gases: properties of gases, gas pressure, Boyle’s Law, Charles’s Law, Gay–Lussac’s Law, The Combined Gas Law, Avogadro’s Law, Dalton’s Law, Ideal Gas Law, Graham’s Law
7. Solutions: electrolytes and nonelectrolytes, solubility, percent concentration, molarity, dilutions, solutions in chemical reactions, properties of solutions
8. Acids and Bases: strengths of acids and bases, ionization of water , the pH scale, calculating pH, reactions of acids and bases, organic acids, buffers
9. Organic chemistry: naming organic compounds, chemistry and physiological behavior of proteins, DNA, steroids and lipids

**Laboratory exercises**

1. Safety, review lab techniques
2. Graham’s Law
3. Boyle’s Law
4. Charles’ Law
5. Factors affecting rate of reactions, cis and trans isomers
6. Soluble insoluble salts
7. Reaction rate and equilibrium
8. Chemical formulas and naming, D&L isomers
9. La Chatlier’s principle, equilibrium reactions
10. Buffers, properties of acids and bases
11. Amino acids, proteins, testing for proteins, Zwitterions
12. Proteins, organic modeling
13. DNA extraction, DNA tests
14. Lab Final, clean up

N. Course Assignments:

1. Laboratory activities
2. Quizzes in both laboratory and lecture
3. Problem solving, worksheets
4. Exams
5. Final exam

O. Recommended Grading Scale:

NUMERIC	GRADE	POINTS	DEFINITION
93-100	A	4.00	Superior
90-92	A-	3.67	Superior
87-89	B+	3.33	Above Average
83-86	B	3.00	Above Average
80-82	B-	2.67	Above Average
77-79	C+	2.33	Average
73-76	C	2.00	Average
70-72	C-	1.67	Below Average
67-69	D+	1.33	Below Average
63-66	D	1.00	Below Average
60-62	D-	0.67	Poor
00--59	F	0.00	Failure

P. Grading and Testing Guidelines:

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Q. Examination Policy:

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R. Class Attendance and Homework Make-Up Policy:

Click here to enter text.

S. Classroom Expectations:

Click here to enter text.

T. College Procedures/Policies:

**Important information regarding College Procedures and Policies can be found on the [syllabus supplement](#) located at**

**<https://sharept.ncstatecollege.edu/committees/1/curriculum/SiteAssets/SitePages/Home/SYLLABUS%20SUPPLEMENT.pdf>**

**The information can be found Choose an item.**