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 MATH0074 with minimum grade of C- or COMPASS Math score of 61 and an Algebra score of 31 or MATH 0086 with minimum grade of C- or STAT 0086 with minimum grade of C-

G. Syllabus Effective Date: Fall, 2017

H. Textbook(s) Title:
   Chemistry
   - Author: Timberlake
   - Copyright Year: 2018
   - Edition: 13th
   - ISBN #: 9780134421353

I. Workbook(s) and/or Lab Manual:
   Laboratory Manual for General, Organic, and Biological Chemistry (Provided by instructor)

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**

<table>
<thead>
<tr>
<th>College-Wide Learning Outcomes</th>
<th>Assessments - - How it is met &amp; When it is met</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication – Written</td>
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<td>Communication – Speech</td>
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<tr>
<td>Intercultural Knowledge and Competence</td>
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<tr>
<td>Critical Thinking</td>
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<td>Information Literacy</td>
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<td>Quantitative Literacy</td>
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</table>

L. **Course Outcomes and Assessment Methods:**

Upon successful completion of this course, the student shall:

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Assessments – How it is met &amp; When it is met</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Use and apply the units of the metric system, demonstrate the ability to develop the correct conversion factor to solve dimensional analysis problems</td>
<td>quizzes, laboratory exercises, worksheets, exam 1, final, met at end of semester</td>
</tr>
<tr>
<td>2. Predict the chemical behavior of the 1st 30 elements by their arrangement on the periodic table, Compare the characteristics of the subatomic particles making use of the periodic table</td>
<td>quizzes, laboratory exercises, worksheets, exam 1, final, met at end of semester</td>
</tr>
<tr>
<td>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</td>
<td>quizzes, laboratory exercises, worksheets, exam 1, final, met at end of semester</td>
</tr>
<tr>
<td>4. Distinguish between the basic chemical reactions and demonstrate how to balance chemical reactions and determine stoichiometric ratios.</td>
<td>quizzes, laboratory exercises, worksheets, exam 1, final, met at end of semester</td>
</tr>
<tr>
<td>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</td>
<td>quizzes, laboratory exercises, worksheets, exam 1, final, met at end of semester</td>
</tr>
<tr>
<td>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</td>
<td>quizzes, laboratory exercises, worksheets, exam 1, final, met at end of semester</td>
</tr>
<tr>
<td>7. Describe the nature of aqueous solutions, how they are prepared, and their characteristics, predict their behavior upon erythrocytes</td>
<td>quizzes, laboratory exercises, worksheets, exam 2, final, met at end of semester</td>
</tr>
<tr>
<td>8. Categorize the properties of a solution and distinguish between various types of solutions demonstrate the ability to perform calculations involving concentrations</td>
<td>quizzes, laboratory exercises, worksheets, exam 2, final, met at end of semester</td>
</tr>
<tr>
<td>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 the tell patient’s acid-base status</td>
<td>quizzes, laboratory exercises, worksheets, final, met at end of semester</td>
</tr>
</tbody>
</table>
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.

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, electronegativity 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
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:**

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

P. **Grading and Testing Guidelines:**

Click here to enter text.

Q. **Examination Policy:**

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R. **Class Attendance and Homework Make-Up Policy:**

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S. **Classroom Expectations:**

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T. **College Procedures/Policies:**

**Attendance Requirements:** All students are required to attend all scheduled classes and examinations. Each faculty member has the right to establish regulations regarding attendance that he/she considers necessary for successful study.

Students who do not attend classes may be administratively withdrawn from those classes. However, failure to attend classes does not constitute withdrawal, and students are expected to process a formal withdrawal through the Student Records Office in Kee Hall.

**Student engagement requirements:**
Student engagement is based on the “active pursuit” of learning which can be measured by class attendance, class participation (in class or online), taking required quizzes/examinations, and submission of work assignments or papers. Student engagement consists of a student attending at least 60% of the class sessions (there should be attendance throughout the term) and/or completing 75% of the assignments listed on the syllabus at the midpoint in the term. Exceptions can be made when there is on-going communication between the student and faculty member. The communication must be documented and the faculty member and student must be in agreement regarding the exception. Students not meeting the expectation will be administratively withdrawn from class. If a student believes he/she was administratively withdrawn in error, he/she may file an appeal. Being administratively withdrawn may have program and financial aid implications.

**Academic Misconduct** is any activity that tends to compromise the academic integrity of the college, or subvert the educational process. Examples of academic misconduct include, but are not limited to:

1. **Violation of course or program rules** as contained in the course syllabus or other information provided to the student; violation of program requirements as established by departments and made available to students.

2. **Plagiarism** including, but not limited to, submitting, without appropriate acknowledgment, any written, visual or oral material that has been copied in whole or in part from the work of others (whether such source is published or not) even if the material is completely paraphrased in one’s own words. This includes another individual’s academic composition, compilation, or other product, or a commercially prepared paper. Plagiarism also includes submitting work in which portions were substantially produced by someone acting as a tutor or editor.

   Such practices constitute plagiarism regardless of motive. Those who deny deceitful intent, claim not to have known that the act constituted plagiarism, or maintain that what they did was inadvertent are nevertheless subject to penalties when plagiarism has been confirmed.

3. **Cheating** and dishonest practices in connection with examinations, papers and projects, including but not limited to using unauthorized notes, study aids or information on an examination; taking an exam or doing work for another student; providing one’s own work for another student to copy and submit as his/her own; or allowing another student to do one’s work and then submitting the work as one’s own. Also included would be altering a graded work after it has been returned, then submitting the work for re-grading; or submitting identical or similar papers for credit in more than one course without prior permission from the course instructors.

4. **Fabrication** including but not limited to providing material, information or other assistance to another person with the knowledge that such aid could be used in any of the violations stated above, or providing false information in connection with any inquiry regarding academic integrity.

5. **Obtaining an Unfair Advantage** including, but not limited to stealing, reproducing, circulating, or otherwise gaining access to examination materials prior to the time authorized by the instructor; unauthorized collaborating on an academic assignment; taking, hiding or altering resource material; or undertaking any activity with the purpose of creating or obtaining an unfair advantage over another student’s academic work.

6. **Aiding and Abetting Academic Dishonesty** including, but not limited to providing material, information or other assistance to another person with the knowledge that such aid could be used in any of the violations stated above, or providing false information in connection with any inquiry regarding academic integrity.

7. **Alteration of Grades or Marks** including but not limited to, action by the student in an effort to change the earned credit or grade.
In addition, cases of academic dishonesty may involve photocopied materials. Materials used may fall under the Copyright Act. Violations of said Act may subject the user and/or the College to sanctions.

Statement on Disabilities: Any student who requires reasonable accommodations related to a disability should inform the course instructor and the Coordinator of Specialized Services (Room 138 in Kee Hall; phone 419-755-4727).

Students who encounter difficulty in any of their courses are encouraged to visit the Tutoring Resource Center (Room 119 in Fallerus Technical Education Center) for tutoring assistance, and the Student Success Center (Room 136 in Kee Hall) for academic assistance, advising services, referrals for personal counseling and Learning Disability (LD) Testing.

Statement on Withdrawals: As a student, you are expected to attend class. If you are unable or choose not to attend class, or if for whatever reason you are unable to keep up with the requirements of a course, you need to officially drop the class at the Student Records Office. Refund dates and withdrawal dates will vary slightly from term to term. Contact the Student Records Office for applicable dates. Additionally these dates are posted on the academic calendar available on the college’s website, www.ncstatecollege.edu, under the Academics heading on the home page and are available at the Student Records Office in Kee Hall. Students should go to the Student Records Office (Room 142 in Kee Hall) to process their withdrawal from any class.

If you choose to walk away from your class without officially withdrawing from it, the faculty member teaching the class must grade your classroom performance on the material available to him or her. This normally results in an "F" grade. An "F" grade can lower your grade point average considerably depending on the total credits accumulated.