1. **COURSE TITLE\*:** First Year Chemistry II
2. **CATALOG – PREFIX/COURSE NUMBER/COURSE SECTION\*:** CHEM 1152
3. **PREREQUISITE(S)\*:** CHEM 1151

**COREQUISITE(S)\*:** CHEM 1162

1. **COURSE TIME/LOCATION/MODALITY: (*Course Syllabus – Individual Instructor Specific*)**
2. **CREDIT HOURS\*:** 4 **LECTURE HOURS\*:** 4

 **LABORATORY HOURS\*:** 0  **OBSERVATION HOURS\*:** 0

1. **FACULTY CONTACT INFORMATION: *(Course Syllabus – Individual Instructor Specific)***
2. **COURSE DESCRIPTION\*:**

A continuation of the study of college chemistry covering, intermolecular forces of attraction and phase changes, solutions and colligative properties, chemical kinetics, chemical equilibrium, acid-base equilibria, thermodynamics, electrochemistry, and descriptive chemistry.

1. **LEARNING OUTCOMES\*:**

Upon completion of this course the student should be able to:

1. List and discuss the intermolecular forces of attraction and explain their role in determining melting points, boiling points and vapor pressures,

2. Discuss the properties of solids including the bonding in ionic, network, molecular, and metallic solids,

3. Discuss and solve problems pertaining to solution concentration, Henry'sLaw and colligative properties,

4. Discuss the solution process using appropriate terminology and chemical equations,

 5. Perform calculations involving reaction rates and determine reaction orders,

 6. Define and calculate activation energy,

 7. Determine rate equations from reaction mechanisms,

 8. Calculate equilibrium constants from the free energy changes of reactions,

 9. Discuss the nature of the equilibrium state and predict the effects of external factors on equilibrium systems,

10. Write and use equilibrium constant and equilibrium quotient expressions,

11. Explain and write chemical equations pertaining to the Arrhenius definition of acids and bases,

12. Discuss and write equations pertaining to the autoionization of water,

13. Write the Bronsted definition of acids and bases,

14. Given a Bronsted acid-base pair, write a chemical equation for the corresponding proton-transfer reaction, identify the conjugate acid-base pairs in the reaction, and predict the direction of the reaction,

15. Define and distinguish between weak and strong acids and bases and provide examples of each,

16. Solve problems pertaining to the water ionization constant, the pH scale and acid and base equilibrium constants,

17. Discuss the common ion effect,

18. Describe buffer solutions and use appropriate chemical equations and equilibrium constant expressions to show how they resist changes in pH,

19. Discuss and apply thermodynamic principles to calculations involving free energy, entropy, and equilibrium,

20. Solve problems pertaining to the Nernst equation,

21. Explain the role of electrochemistry in the operation of batteries and corrosion, and

22. Demonstrate a knowledge of the descriptive chemistry of selected elements.

1. **ADOPTED TEXT(S)\*:**

*Chemistry & Chemical Reactivity*, Hybrid Edition, 9th Edition

By: Kotz, Treichel, and Townsend

Cengage Learning, 2014

ISBN: 978-1-285-46253-0

1. **OTHER REQUIRED MATERIALS: (SEE APPENDIX C FOR TECHNOLOGY REQUEST FORM.)\*\***

A calculator is required.

1. **GRADING SCALE\*\*\*:**

Grading will follow the policy in the catalog. The scale is as follows:

A: 90 – 100

 B: 80 – 89

 C: 70 – 79

 D: 60 – 69

 F: 0 – 59

1. **GRADING PROCEDURES OR ASSESSMENTS: (*Course Syllabus – Individual Instructor Specific)***
2. **COURSE METHODOLOGY: *(Course Syllabus – Individual Instructor Specific)***

**14. COURSE OUTLINE: *(Course Syllabus – Individual Instructor Specific)***

***(Insert sample course outline with learning objectives tied to assignments / topics.)***

**15. SPECIFIC MANAGEMENT REQUIREMENTS\*\*\*:**

* You may not use programmable calculators or cell phone calculators for tests.
* Please understand that your work may be seen by others. Others may see your work when being distributed, during group project work, or if it is chosen for demonstration purposes. There is also a possibility that your papers may be submitted electronically to other entities, for reasons such as for plagiarism checks.
* ACADEMIC MISCONDUCT: Any student who commits any type of academic misconduct as stated in the current college catalogue will receive an "F" for the exam, quiz, or evaluated project.

**16. FERPA:\***

Students need to understand that your work may be seen by others. Others may see your work when being distributed, during group project work, or if it is chosen for demonstration purposes. Students also need to know that there is a strong possibility that your work may be submitted to other entities for the purpose of plagiarism checks.

**17. DISABILITIES:\***

Students with disabilities may contact the Disability Services Office, Central Campus, at 800-628-7722 or 937-393-3431.

**18. OTHER INFORMATION\*\*\*:**

**SYLLABUS TEMPLATE KEY**

**\*** Item cannot be altered from that which is included in the master syllabus approved by the Curriculum Committee.

**\*\*** Any alteration or addition must be approved by the Curriculum Committee

**\*\*\*** Item should begin with language as approved in the master syllabus but may be added to at the discretion of the faculty member.