COURSE OUTLINE

Course Number  
CHE 102

Course Title  
GENERAL CHEMISTRY II

Credits
3

Hours:  
lecture/Lab/Other
2/3/1

Co- or Pre-requisite  
Prerequisite: CHE 101 (C or better or permission of Course Coordinator)
Corequisite: MAT 146 or higher

Implementation  
sem/year
SPRING AND SUMMER
EVERY YEAR

Catalog description (2006-2009 Catalog): []
Theoretical and practical aspects of kinetics, simple and ionic chemical equilibria, thermodynamics, spectrophotometry, electrochemistry, nuclear chemistry, and the major families of chemical elements, with emphasis on the coordination chemistry of the transition elements. The laboratory work includes qualitative cation and anion analysis.

Is course New, Revised, or Modified? [  
NO

Required texts/other materials:
General Chemistry: Whitten, Davis, Peck, and Stanley  
General Chemistry II: Course Manual  Alfare, Carlo  MCCC, 7th Edition
General Chemistry II: Laboratory Manual  Alfare, Carlo  MCCC, 9th Edition

Revision date:  
2016

Course coordinator:  
(First Name, telephone number, email address)
Carlo Alfare  Professor of Chemistry & Course Coordinator  
X3381 alfarec@mccc.edu

Information resources:
General Chemistry: Whitten, Davis, Peck, and Stanley  
General Chemistry II: Course Manual  Alfare, Carlo  MCCC, 7th Edition
General Chemistry II: Laboratory Manual  Alfare, Carlo  MCCC, 9th Edition

Other learning resources
Chemistry Laboratory Activities
Other resources:
Films, computer learning programs, various web based resources.
Course Competencies/Goals:

1. The student will be able to analyze, explain, solve problems with, discuss, and answer questions about Chemical Thermodynamics, Chemical Kinetics, Chemical Equilibrium, Spectrophotometry

2. The student will be able to analyze, explain, solve problems with, discuss, and answer questions about Electrochemistry, Acids and Bases, Ionic Equilibria

3. The student will be able to analyze, explain, solve problems with, discuss, and answer questions about Chemistry of the Representative Elements I: The Metals, Chemistry of the Rep. Elements II: The Metalloids and Nonmetals, and The Transition Elements; Coordination Chemistry, Nuclear Chemistry, Organic Chemistry

4. Each student will be able to perform chemical experimentation in a safe and scientific manner, using proper scientific and laboratory safety procedures, manipulate chemicals and glassware, use laboratory balances, perform quantitative analysis such as titrations, pipetting and preparation of solutions, wet qualitative analysis, and treat the data that the student collects. Students will also be able to use a Laboratory Information Management System to collect and treat data.

5. Each student will be able to collect and analyze data from experiments (working alone), using critical thinking and quantitative reasoning skills in observing, organizing and analyzing data, synthesizing information, interpreting results, and communicating the results of the analyses and laboratory investigations orally and in writing.

Course-specific General Education Knowledge Goals and Core Skills.

General Education Knowledge Goals

Goal 1. Communication. Students will communicate effectively in both speech and writing.

Goal 2. Mathematics. Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.

Goal 3. Science. Students will use the scientific method of inquiry, through the acquisition of scientific knowledge.

Goal 4. Technology. Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.

Goal 5. Social Science. Students will use social science theories and concepts to analyze human behavior and social and political institutions and to act as responsible citizens.

Goal 6. Humanities. Students will analyze works in the fields of art, music, or theater; literature; philosophy and/or religious studies; and/or will gain competence in the use of a foreign language.

Goal 7. History. Students will understand historical events and movements in World, Western, non-Western or American societies and assess their subsequent significance.

Goal 8. Diversity. Students will understand the importance of a global perspective and culturally diverse peoples.


MCCC Core Skills

Goal A. Written and Oral Communication in English. Students will communicate effectively in speech and writing, and demonstrate proficiency in reading.

Goal B. Critical Thinking and Problem-solving. Students will use critical thinking and problem solving skills in analyzing information.

Goal C. Ethical Decision-Making. Students will recognize, analyze and assess ethical issues and situations.

Goal D. Information Literacy. Students will recognize when information is needed and have the knowledge and skills to locate, evaluate, and effectively use information for college level work.

Goal E. Computer Literacy. Students will use computers to access, analyze or present information, solve problems, and communicate with others.

Goal F. Collaboration and Cooperation. Students will develop the interpersonal skills required for effective performance in group situations.

Goal G. Intra-Cultural and Inter-Cultural Responsibility. Students will demonstrate an awareness of the responsibilities of intelligent citizenship in a diverse and pluralistic society, and will demonstrate cultural, global, and environmental awareness.
Units of study in detail.

I. Chemical Thermodynamics:  
The Student will evidence a knowledge and understanding, both quantitative and qualitative, of the Laws of Thermodynamics, related concepts, and other topics generally important to an understanding of chemical thermodynamics through laboratory participation, written discussions, answering questions, and solving problems. (Gen Ed Goal 1, 2, 3, 4; Course Competencies A, B, D, E, F)

II. Chemical Kinetics:  
The Student will evidence a knowledge and understanding, both quantitative and qualitative, of Chemical Kinetics, theories, thermodynamical considerations, related concepts, and other topics generally important to an understanding of chemical kinetics through laboratory participation, written discussions, answering questions, and solving problems. (Gen Ed Goal 1, 2, 3, 4; Course Competencies A, B, D, E, F)

III. Chemical Equilibrium:  
The Student will evidence a knowledge and understanding, both quantitative and qualitative, of chemical equilibria, spectrophotometry, related concepts, and other topics generally important to an understanding of Chemical Equilibrium and Spectrophotometry through laboratory participation, written discussions, answering questions, and solving problems. (Gen Ed Goal 1, 2, 3, 4; Course Competencies A, B, D, E, F)

IV. Electrochemistry:  
The Student will evidence a knowledge and understanding, both quantitative and qualitative, of Electrochemistry, thermodynamic and equilibrium relations, equivalents, Gibbs Free Energy, related concepts, and other topics generally important to an understanding of Electrochemistry through laboratory participation, written discussions, answering questions, and solving problems. (Gen Ed Goal 1, 2, 3, 4; Course Competencies A, B, D, E, F)

V. Acids and Bases:  
The Student will evidence a knowledge and understanding, both quantitative and qualitative, of Acid and Base theories, related concepts, and other topics generally important to an understanding of these concepts through laboratory participation, written discussions, answering questions, and solving problems. (Gen Ed Goal 1, 2, 3, 4; Course Competencies A, B, D, E, F)

VI. Ionic Equilibria:  
The Student will evidence a knowledge and understanding, both quantitative and qualitative, of Ionic Equilibria, related concepts, and other topics generally important to an understanding of these concepts through laboratory participation, written discussions, answering questions, and solving problems. (Gen Ed Goal 1, 2, 3; Course Competencies A, D, F)

VII. Chemistry of the Representative Elements I: The Metals:  
The Student will evidence a knowledge and understanding of the properties, electron configurations, reactions, trends, and industrial processes involving the representative metals, related concepts, and other topics generally important to an understanding of these concepts through laboratory participation, written discussions, answering questions, and solving problems. (Gen Ed Goal 2, 3; Course Competencies A, B)

VIII. Chemistry of the Representative Elements I: The NonMetals:  
The Student will evidence a knowledge and understanding of the properties, electron configurations, reactions, trends, and industrial processes involving the representative non-metals and metalloids, related concepts, and other topics generally important to an understanding of these concepts through
laboratory participation, written discussions, answering questions, and solving problems. (Gen Ed Goal 2, 3; Course Competencies A, B)

IX. The Transition Metals
The Student will evidence a knowledge and understanding of the properties, electron configurations, reactions, trends, industrial processes, compounds, and complexes and coordination chemistry involving the transition metals, traditional wet laboratory qualitative analysis, related concepts, and other topics generally important to an understanding of these concepts through laboratory participation, written discussions, answering questions, and solving problems. (Gen Ed Goal 2, 3; Course Competencies A, B, D, F)

X. Nuclear Chemistry:
The Student will evidence a knowledge and understanding of nuclear structure, nuclear chemistry, reactions, radioactivity, fission, fusion, applications, related concepts, and other topics generally important to an understanding of these concepts through laboratory participation, written discussions, answering questions, and solving problems. (Gen Ed Goal 2, 3; Course Competencies A, B)

XI. Organic Chemistry:
The Student will evidence a knowledge and understanding of carbon chemistry, organic formulas, nomenclature, functional groups, reactions, related concepts, and other topics generally important to an understanding of these concepts through laboratory participation, written discussions, answering questions, and solving problems. (Gen Ed Goal 2, 3; Course Competencies A, B)

Evaluation of student learning:
15 weekly quizzes, three major exams, comprehensive and cumulative final exam, and 15 Laboratory Reports. Acceptable laboratory participation and performance along with a passing grade on the final examination are required to pass the course. All evaluations are focused on course competencies/goals. Student performance objectives include:
1. You must satisfactorily complete the assigned laboratory experiments. (Missing 3 or more will constitute an F for the course).
2. You must participate in weekly recitations (missing 3 or more may constitute an F for the course).
3. You must complete the weekly quizzes and hour tests as assigned.
4. You must achieve a passing grade on a comprehensive final examination.
5. You must complete a minimum of six hours of work on chemistry at home each week, including the use of the Text CD.
6. You must demonstrate your level of performance (see page 3 for "grading") by mastering a large part of the material covered by lectures, films, homework, laboratory work and the textbooks as detailed in the specific course objectives that follow.

Mercer County Community College is committed to academic integrity – the honest, fair and continued pursuit of knowledge, free from fraud or deception. Read the booklet on Academic Integrity. Violations will result in failure in the test, lab or, if serious or repeated, the course. Academic integrity is violated when a student:
Uses or obtains unauthorized assistance in any academic work.
Gives fraudulent assistance to another student.
Knowingly represents the work of others as his/her own, or represents previously completed academic work as current.
Fabricates data in support of an academic assignment
Inappropriately or unethically uses technological means to gain academic advantage