



Dept Curriculum Committee Chair

Department Chair

Con. Curriculum Committee

Director of Honors C

Handwritten signature: Bruce Thomas Foster

Handwritten date: 2/15/03

Chair

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Course Proposals for Chemistry Program Revisions

Part II. 1. New Syllabus of Record

I. Catalog Description

Course Title: Concepts in Chemistry I

Prefix: CHEM

Hours: 3c-3l-4sh

Prerequisites: none

Co-requisites: none

Description: Introductory course for chemistry majors. This course is the first half of a two-semester sequence designed to give students the foundation of knowledge and laboratory techniques required to successfully complete a chemistry degree program. Topics include atomic theory, an introduction to chemical reactions, stoichiometry, thermochemistry, chemical bonding and molecular geometry, transition metal complexes, polymers and biomolecules.

II. **Objectives:** Upon the successful completion of the course, the student will:

- 1) be familiar with the basic language of chemistry, including molecular formulas, nomenclature, and the writing of chemical equations.
- 2) be able to carry out stoichiometric calculations related to chemical reaction systems.

- 4) understand the current atomic model for matter and its historical development.
- 5) be able to draw correct Lewis structures of any simple main-group molecule or polyatomic ion.

- 5) Thermochemistry (5 hours)
 - a) enthalpy, first law of thermodynamics
 - b) phase changes, enthalpies of reaction

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A: $\geq 90\%$ B: 80-89% C: 70-79% D: 60-69% F: $< 60\%$

VI. Attendance Policy:

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- 4) Hydrates
- 5) Acid-Base Titration
- 6) Precipitates
- 7) Qualitative Analysis
- 8) Zinc and Hydrochloric Acid
- 9) Dissolution Reactions
- 10) KOH & HCl
- 11) Chromatography
- 12) VSEPR Model
- 13) Molecular Models on a Computer
- 14) Check-Out and Final Quiz

Part II. 2. Summary of the proposed revisions.

An introductory course for chemistry majors. Topics covered include atomic theory, an
introduction to chemical reactions, stoichiometry, thermochemistry, chemical bonding

Part II. 4. Old syllabus of record.

COURSE SYLLABUS

I. Catalog Description

CH 113 - Concepts in Chemistry

4 credits

3 lecture hours

2 lab hours

III. COURSE OUTLINE

A. Some Useful Ideas and Tools of Chemistry (1 lecture)

1. Scientific measurement systems and units
2. Problem-solving techniques

B. Atoms, Molecules and Ions (4 lectures)

1. Simple models of the atom
2. The "mole" in chemistry
3. The periodic table of the elements
4. Chemical formulas and nomenclature
5. Quantitative determination of chemical formulas

C. An Introduction to Inorganic Reactions (4 lectures)

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3. Properties of bonds
4. Molecular shape (VSEPR model)

J. Further Concepts of Chemical Bonding (3 lectures)

1. Valence bond theory
2. Hybrid atomic orbitals

K. Gases and Their Behavior (4 lectures)

2. The Ideal Gas Law

2.16 Kinetic Molecular Theory (KMT)

L. Intermolecular Forces, Liquids, and Solids (3 lectures)

1. KMT and Intermolecular Forces
2. Properties of Liquids
3. Properties of Solids

M. Solutions and Their Behavior (3 lectures)

1. Units of Concentration
 2. The Solution Process
 3. Colligative Properties
- ### IV. Evaluation Methods

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V. Required Texts

Lecture:

1. *Kotz & Treichel, Principles of Chemistry & Chemical Reactivity*, Saunders:

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Chemistry 113
Laboratory Schedule

General Topic

Experiment

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Part II. 5. LIBERAL STUDIES COURSE APPROVAL. PARTS I-III: GENERAL INFORMATION

I. Please indicate the LS category(ies) for which you are applying:

LEARNING SKILLS:

First Composition Course Second Composition Course
 Mathematics

KNOWLEDGE AREAS:

<input type="checkbox"/> Humanities: History	<input type="checkbox"/> Fine Arts
<input type="checkbox"/> Humanities: Philos/Rel Studies	<input type="checkbox"/> Social Sciences
<input type="checkbox"/> Humanities: Literature	<input type="checkbox"/> Non-Western Cultures
<input checked="" type="checkbox"/> Natural Sci: Laboratory	<input type="checkbox"/> Health & Wellness
<input type="checkbox"/> Natural Sci: Non-laboratory	<input type="checkbox"/> Liberal Studies Elective

II. Please use check marks to indicate which LS goals are primary, secondary, incidental, or not

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- IV. A. This is not a multiple-section or multiple-instructor course.
- B. The contributions of minorities and women to the development and advancement of chemistry will be included wherever possible. This would include the historically significant contributions of such notable women and minorities as Marie Curie and Lavinia Lloyd Dock in the study of radioactivity, Maria Anna Biamonte Lavinia in the

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CHECK LIST -- NATURAL SCIENCES (Laboratory)

Knowledge Area Criteria which the course must meet:

- Treat concepts, themes and events in sufficient depth to enable students to appreciate the complexity, history and current implications of what is being studied; and not be merely cursory coverage of lists of topics.
- Suggest the major intellectual questions/problems which interest practitioners of a discipline and explore critically the important theories and principles presented by the discipline.
- Allow students to understand and apply the methods of inquiry and vocabulary commonly used in the discipline.
- Encourage students to use and enhance, wherever possible, the composition and mathematics skills built in the General Education Program.

Natural Science Criteria which the course must meet:

- Examine a body of knowledge of natural science that will contribute to an understanding of the natural world.
- Provide an understanding of the development of natural science theories and their modification.
- Teach students to formulate and test hypotheses.
- Provide an understanding of some of the "great moments" in the history of natural science and the individuals, including women and minorities, responsible for them.

Natural Science Laboratory Criteria which the course must meet:

- Provide students with opportunities to learn and apply data-gathering techniques.
- Provide students with opportunities to develop skills in making accurate observations, in formulating concise and appropriate descriptions of natural phenomena, and in producing meaningful systems of classification for natural objects.
- Provide students with opportunities to apply theories to practice in the working world of science.

Additional Natural Science Criteria which the course should meet: