

This is a SouthArk Master Syllabus. The course syllabus distributed by the instructor may include additional requirements, must be followed by the student in the given term, and is considered to supersede the Master Syllabus.

Course Number

CHEM 1024/L

Course Title

Chemistry I for Science Majors/Lab

Course Description

Prerequisites: BSTD 0613, BSTD 0513 with a grade of "C" or better, or make an appropriate score on the placement test, and one full year of high school chemistry or its equivalent completed within the last five years with a grade of "C" or better. Students who have had no high school chemistry are advised to take CHEM 1014 or its equivalent. This is the first course in a two-course sequence of algebra-based chemistry designed for science majors and pre-professionals. Course incorporates critical thinking to explore, analyze, and evaluate theoretical and quantitative chemistry principles, nomenclature, the mole, stoichiometry, reactions, gases, thermochemistry, and nuclear chemistry. Lab is required. Three hours lecture and two hours laboratory.

College Mission

South Arkansas Community College promotes excellence in learning, teaching, and service; provides lifelong educational opportunities; and serves as a cultural, intellectual, and economic resource for the community.

College Wide Student Learner Outcomes

Critical Thinking

Responsibility

Communication

ACTS Course

Program Course

Program Outcomes

ACTS Outcomes

The state requires that we cover certain topics in order to meet the requirements of the Arkansas Course Transfer System. The requirements are stated below.

Upon completion of this course, the student will be able to recognize, discuss, describe, explain, and apply knowledge of the following:

1. Inorganic nomenclature.
2. Chemical reactions.
3. Stoichiometry
4. Gases and the kinetic-molecular theory
5. Thermochemistry
6. Quantum theory and atomic structure
7. Electron configuration and chemical periodicity
8. Valance bond theory and molecular orbital theory
9. Nuclear Chemistry

Course Learner Outcomes

CLO #	Course Learner Outcomes	Unit Outcomes/ Competencies	ACTS Outcomes	Program Outcomes	Critical Thinking	Communication	Responsibility	Assessment
CLO 1	Write formulas and use correct nomenclature for elements and compounds.	Unit I:1-7	1		CT1			Final Exam
CLO 2	Analyze the characteristics of chemical reactions and predict reaction type.	Unit I: 8 Unit II: 1	2		CT3			Final Exam
CLO 3	Utilizing the mole concept, perform stoichiometric calculations to the correct number of significant figures.	Unit II: 2	3		CT2			Final Exam

CLO 4	Analyze gas laws, perform calculations, and explain gas law relationships using the kinetic-molecular theory.	Unit II: 3	4		CT2			Final Exam
CLO 5	Distinguish between thermochemistry principles and perform calculations.	Unit II: 4	5		CT2			Final Exam
CLO 6	Analyze atomic structure, the shell model, and quantum theory.	Unit III: 1	6		CT2			Final Exam
CLO 7	Write electron configurations and interpret chemical periodicity.	Unit III: 2	7		CT2			Final Exam
CLO 8	Differentiate between types of chemical bonding including valence bond theory and molecular orbital theory.	Unit IV: 1-3	8		CT2			Final Exam
CLO 9	Explain chemical and nuclear changes, radioactivity, fusion and fission, and other aspects of nuclear chemistry.	Unit IV: 4	9		CT2			Final Exam
CLO10	Demonstrate competency in the scientific method and chemistry lab techniques by effectively communicating experimental findings in writing.	Units 1-4	1-8		CT4	C1	R2	Final Exam, Laboratory Notebook

Unit Outcomes/ Competencies

Unit I: Chemical Foundations

1. Differentiate between the types of matter.
2. Perform measurements and conversions calculations using correct units and significant figures.
3. Explain atomic structure and the organization of the Periodic Table.
4. Calculate and interconvert between moles, mass, and atoms.
5. Differentiate between types of chemical bonds and formulas.
6. Write formulas and use correct nomenclature for elements and compounds.
7. Calculate mole ratios to determine empirical and molecular formulas.
8. Write balanced chemical equations.

Unit II: Reactions, Gases, and Thermochemistry

1. Analyze the characteristics of specific chemical reactions and predict reaction type.
2. Utilizing the mole concept, perform stoichiometric calculations to the correct number of significant figures.
3. Analyze gas laws, perform calculations, and explain gas law relationships using the kinetic-molecular theory.
4. Distinguish between thermochemistry principles and perform calculations.

Unit III: Quantum Mechanics, Electron Configuration, and Chemical Periodicity

1. Analyze atomic structure, the shell model, and quantum theory.
2. Write electron configurations and interpret chemical periodicity.

Unit IV: Bonding, Liquids and Solids, and Nuclear Chemistry

1. Analyze bond types, Lewis structures, electronegativity, bond polarity, and bond energies.
2. Differentiate between the valence bond theory and molecular orbital theory.
3. Distinguish between the bonding characteristics of liquids and solids.
4. Explain chemical and nuclear changes, radioactivity, fusion and fission, and other aspects of nuclear chemistry.

Assessment Description(s)

Two embedded questions in the final exam for each outcome. Laboratory reports are evaluated using a standard laboratory rubric.

Materials and Technological Requirements

1. *Chemistry: A Molecular Approach* 2nd Edition, Nivaldo J. Tro. Pearson/Prentice Hall Publishers. ISBN: 978-0321651785.
2. OWLv2 Access Multi-Term (includes eBook for *Chemistry and Chemical Reactivity* 9th Edition, Kotz, et al.) + Ball's Essential Algebra. ISBN: 9781305434202.
3. Student Lab Notebook for Chemistry – Hayden/McNeil. ISBN: 978-1930882232.
4. Visorgogs – Eye protection for the laboratory.
5. Calculator: TI-83, or TI-84. We will use these in CHEM II as well.

6. Reliable computer and internet access for online homework, Blackboard, and Student e-mail, etc. Course announcements and assignments will be posted to Blackboard. Specific student information will be received and sent only through your e-mail account at SouthArk. (If you have technical problems with Blackboard, please contact the Distance Learning Director.)

Class Attendance Policy

Students are expected to attend all classes in which they are enrolled. If a student is absent from a class session, it is the student's responsibility to make arrangements to complete or make up any work missed. No make-up work for missed classes will be allowed without the approval of the instructor. Students who enroll late must assume all responsibility for work missed. Classes not attended as a result of late enrollment may be counted toward excessive absences. Students not attending the entire class period may be counted absent for that period. An instructor may drop students with a grade of "WE" if students have been absent for an excessive number of days. Warning letters will be sent to the students advising them of the consequences of nonattendance and urging them to contact their instructors immediately. Excessive absences are defined as follows:

Regular Semester

Courses which meet once a week	2 absences
Courses that meet twice per week	3 absences
Courses that meet four times per week	5 absences

Summer Session

Courses that meet four times per week in a five week session	3 absences
Courses which meet two evenings per week in a 10 week session	3 absences

Students enrolled in special programs or individualized instruction should contact their program director/instructor regarding specific attendance requirements for the program/course. Some of the selective-admission, health-science programs have specific criteria regarding attendance. Students are encouraged to refer to program policies in these matters.

Jury Duty/Military/Official School Function

Scheduled absences are those that occur due to college-related activities or as a result of summons to jury duty or military duty. Classes missed as a result of scheduled absences will not be counted as excessive absences if the instructor is notified and provided documentation prior to the absence(s). Make-up work for scheduled absences will be at the discretion of the instructor.

In all instances, documentation must be provided to the instructor within 24 hours of receipt. Documentation should come from an appropriate party on letterhead or other official stationery with a signature and contact information. Documentation should list the corresponding dates of the leave.

Medical leave

For medical-related absences, documentation must include written notice from the treating medical professional documenting time needed off related to medical reasons and time student may resume classes. The medical reason does not need to be listed on the documentation; the documentation must include only that there is a medical reason, the amount of time the student needs to be absent, and the time the student should be able to return to classes. Students who elect to work at home while on excused leave must meet with their instructors to make arrangements to do so. Working on coursework while on medical leave is not a requirement but can be requested by students. If students request that they be allowed to work at home while on an excused leave, the instructor will make every reasonable effort to ensure that the student is able to do so.

For students who have a medical condition necessitating time off or accommodation:

- 1) They may work at home on assignments if they choose to if on medical leave approved by a medical professional
- 2) Receive appropriate accommodations related to coursework (i.e., excused from labs with potentially harmful chemicals, have a larger desk, etc.)
- 3) Resume their studies where they left off once they return to classes
- 4) Be allowed to make up any missed work related to medical leave
- 5) Receive incompletes on their transcripts until coursework is completed, according to the incomplete grade contract.
- 6) Be given a reasonable time frame in which to complete missed coursework

Academic Honesty Policy

Students enrolled at South Arkansas Community College are expected at all times to uphold standards of integrity. Students are expected to perform honestly and to work in every way possible to eliminate academic dishonesty. Academic dishonesty includes cheating and plagiarism, which are defined as follows:

- Cheating is an attempt to deceive the instructor in his/her effort to evaluate fairly an academic exercise. Cheating includes copying another student's homework, class work, or required project (in whole or in part) and/or presenting another's work as the student's own. Cheating also includes giving, receiving, offering, and/or soliciting information on a quiz, test, or examination.
- Plagiarism is the copying of any published work such as books, magazines, audiovisual programs, electronic media, and films or copying the theme or manuscript of another student. It is plagiarism when one uses direct quotations without proper credit or when one uses the ideas of another without giving proper credit. When three or more consecutive words are borrowed, the borrowing should be recognized by the use of quotation marks and proper parenthetical and bibliographic notations.

If, upon investigation, the instructor determines that the student is guilty of cheating or plagiarism, the following penalties will apply:

- The student will receive a penalty of no less than a zero on the work in question.
- The instructor will submit a written report of the incident to the Vice President for Learning
- The Vice President for Learning will determine whether further disciplinary action will be taken.
- All decisions may be appealed for review through the college's Academic Appeals procedure.

Equal Opportunity-Affirmative Action Statement

South Arkansas Community College does not discriminate on the basis of age, race, color, creed, gender, religion, marital status, veteran's status, national origin, disability, or sexual orientation in making decisions regarding employment, student admission, or other functions, operations, or activities.

Library Services

Library Homepage: <http://southark.libguides.com/homepage> Library Contact: LibraryStaff@southark.edu or 870.864.7115

Procedures to Accommodate Students with Disabilities:

If you need reasonable accommodations because of a disability, please report this to the Vice President of Student Services with proper documentation. . VPSS Contact: 870.875.7262

The Early Alert System

In an effort to ensure student retention and success, South Arkansas Community College employs an Early Alert System to identify and support at-risk students as soon as possible in a given semester. The intent of Early Alert is to provide this assistance while there is still time to address behaviors or issues that have the potential of preventing students from completing their courses and degree plans. Students referred through the Early Alert System will be required to work on a corrective action plan with their student advising coach and to include attendance accountability and mandatory academic tutoring either in the academic division or in the Testing and Learning Center (TLC).

Once the Student Advising Coach has met with the referred student, and again when the student has met the prescribed corrective actions, the coach will update the Early Alert System so that the instructor is kept informed of the progress in resolving issues.

Behavioral Review Team

At South Arkansas Community College (SouthArk), we are committed to proactive leadership in student wellbeing and campus safety. By focusing on prevention and early intervention with campus situations that involve any person experiencing distress or engaging in harmful or disruptive behaviors, the BRT will serve as the coordinating hub of existing resources to develop intervention and support strategies and offer case management. Students, faculty, staff, and campus guests are encouraged to report any person on campus who is a concern. BRT Contact: 870.875.7262 BRT@southark.edu

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