STARK STATE COLLEGE

GENERAL SYLLABUS

Course Information

Course Name: General Chemistry I
Course Number: CHM141

Required Materials

Textbook(s): Silberberg, Martin S. ***Chemistry: The Molecular Nature of Matter and Change*** (10th ed., McGraw Hill, New York) — including access to **ALEKS** (Assessment and Learning in Knowledge Spaces). You have been automatically enrolled in the SSC Instant Access textbook program. Once you register through the Learning Management System (LMS), you will have full access to the required textbook.
Required Readings: None
Additional Materials: **Lab Manual:** *CHM141 General Chemistry I Laboratory Manual* (3rd ed., Buyuktanir et al.; available only at the SSC Bookstore). **Safety Gear:** Splash-proof safety goggles and a lab coat are required for all lab sessions. **Lab Notebook:** Used to record data, perform calculations, and complete pre-lab outlines. **Calculator:** A scientific calculator (e.g., Casio fx series or TI-30X IIs) is required; students are responsible for knowing how to use their calculator. **Optional:** *Student Solutions Manual* by Langley and Silberberg (available at the bookstore).

Course Outline/Calendar

The date of coverage and order of coverage may be modified based on the faculty member and events beyond the control of faculty members that interfere with class times and teaching.

16 week lecture topics

Week	Chapter/Topic
1	Syllabus Chapter 1: Keys to Chemistry
2	Chapter 2: Matter
3	Review Q & A **Exam 1**
4	Chapter 3: Stoichiometry
5	Chapter 4: Reactions
6	**Exam 2** Review Q & A
7	Chapter 6: Thermo-chemistry
8	Chapter 7: Quantum Theory
9	**Exam 3** Review Q & A
10	Chapter 8: Electron Configuration

Week	Chapter/Topic
11	Chapter 9: Bonding Models
12	Chapter 10: Molecular Shapes
13	Review Q & A **Exam 4**
14	Chapter 11: Bond Theories
15	Chapter 5: Gases Review for Final Exam
16	**Final Exam**

16 week lab experiments

LABS
All students (including CCP) must buy CHM141 lab manual, lab notebook, lab coat, and splash proof safety goggles. Scientific calculators are required. **Proper attire is required for all labs (see below).** Best Practices in The Chemistry Laboratory/Lab Safety **EXP.1** Separation Techniques **EXP 15.** Guided Inquiry (optional)
EXP.2 Measurements **EXP. 14** Data Analysis: How to Plot Graphs (optional)
EXP. 3 Determination of Density and Error Analysis
Bring your laboratory notebook. **EXP. 4** Gravimetric Analysis How To Keep a Good Laboratory Notebook (reading assignment p135)
EXP. 5 Qualitative Analysis NOMENCLATURE: Naming Chemical Compounds (p397)
EXP. 6 Volumetric Analysis: Acid-Base Titration—**typed lab report required.** The guidelines for the chemistry lab reports (reading assignment p187).
EXP.7 Calorimetry: Energy Flow-—**typed lab report required.** **Exp. 18** Hot and Cold packs
EXP. 8 Hess's law **Exp. 18** Hot and Cold packs
EXP. 9 Beer's Law—**typed lab report required**
EXP. 10 Molecular Geometry: VSEPR Theory, Bonding, and Polarity
EXP. 11 Chromatography and Fabric Dyeing
Lab Practical – Experiments 1-11
EXP. 12 Valence Bond Theory and Hybridization + **Exp.** Gas Law
Final Exam Week - No Lab!

8 week lecture topics

Week #	Lecture Topics	Learning Assignments
1	Introduction to Class & Syllabus Chapter 1: Keys to Chemistry Chapter 2: Matter	*Prerequisite Review* *ALEKS Module 1A* Chapters 1 & 2 Worksheets
2	**Exam 1 (Chapters 1-2)*** Chapter 3: Stoichiometry	*ALEKS Module 1B* *ALEKS Module 2A* Chapter 3 Worksheet
3	Chapter 4: Reactions **Exam 2 (Chapters 3-4)***	*ALEKS Module 2B* *ALEKS Module 2C* Chapter 4 Worksheet
4	Chapter 6: Thermochemistry Chapter 7: Quantum theory	*ALEKS Module 3A* *ALEKS Module 3B* Chapters 6 & 7 Worksheets
5	**Exam 3 (Chapters 6-7)*** Chapter 8: Electron Configuration	*ALEKS Module 3C* *ALEKS Module 4A* Chapter 8 Worksheet
6	Chapter 9: Bonding Models Chapter 10: Molecular Shapes	*ALEKS Module 4B* *ALEKS Module 4C* Chapters 9 & 10 Worksheets
7	**Exam 4 (Chapters 8, 9, 10)*** Chapter 11: Bond Theories	Chapter 11 Worksheet
8	Chapter 5: Gases Review for the Final Exam **Final Exam (Chapters 1-11)***	*ALEKS Module 5* Chapter 5 Worksheet *ALEKS Completion Pie for Extra Credit*

8 week lab experiments

Week	Lab Activity	Lab Report Due*
1	Lab Safety and Best Practices-Bunsen Burner check ***Bring your lab safety kit and lab manual***	
	EXP. 1 Separation Techniques ***Bring your lab safety kit and lab manual***	Safety Questions p.27 & Bunsen Burner Check
2	**EXP. 2** Measurements and Significant Figures **EXP. 14** Data Analysis: How to Plot Graphs	Exp 1 Report
	EXP. 3 Determination of Density and Error Analysis	Exps 2 & 14 Reports

3	**EXP. 4** Gravimetric Analysis: Determination of the Composition of Copper Compds. *PreLab – Complete pp402-406* ***Bring your laboratory notebook*** *Record Keeping: Proper use of laboratory notebook (Read pp 135-140)*	Exp 3 Report
	EXP. 5 The Formula of a Precipitated Compound and Classifying Chemical Reactions **EXP. 15** The Size of an Atom (can be performed any lab day up to Week 7)	Exp 4 Report
4	**EXP. 6** Volumetric Analysis: Acid-Base Titration *(requires typed report)*	Exps 5 & 15 Reports
	EXP. 18 Hot and Cold Packs	Exp 6 Report
5	**EXP. 7** Calorimetry: Energy Flow	Exp 18 Report
	EXP. 8 Hess's Law *(requires typed report)*	Exp 7 Report
6	**EXP. 9** Beer's Law: How Much Dye is in Your Sports Drink?	Exp 8 Report
	EXP. 10 Molecular Geometry: The VSEPR Theory, Bonding, and Polarity	Exp 9 Report
7	**EXP. 11** Molecular Polarity and Chromatography	Exp 10 Report
	LAB PRACTICAL (Experiments 1-11)	Exp 11 Report
8	**EXP. 12** Valence Bond Theory and Hybridization **EXP. 13** Boyle's Law Handout	
	Q & A and Review Day for Final Exam	Exps 12 & 13 Reports

5 week lecture topics and experiments

Date	Lecture Topic	Learning Assignments	Experiment #	Experiment Name	Lab Report Due
Week 1	Syllabus Chapter 1: Keys to Chemistry Chapter 2: Matter **Exam 1**	Chapter 1 Guided Notes **ALEKS Prerequisite Review** Chapter 2 Guided Notes **ALEKS Module 1A** **ALEKS Module 1B**	1	Safety and Best Practices Separation Techniques **Bring your goggles and lab manual**	Handout
			2	Measurements and Significant Figures	**PreLab #2** **Report #1**
			3	Determination of Density and Error Analysis	**PreLab #3** **Report #2**
Week 2	Chapter 3: Stoichiometry Chapter 4: Reactions **Exam 2**	Chapter 3 Guided Notes **ALEKS Module 2A** Chapter 4 Guided Notes **ALEKS Module 2B** **ALEKS Module 2C**	4	Gravimetric Analysis: Determination of the Composition of Copper Compounds **Bring your laboratory notebook** Record Keeping: Proper use of laboratory notebook	**PreLab #4** **Report #3**
			5	The Formula of a Precipitated Compound and Classifying Chemical Reactions	**PreLab #5** **Report #4**
			6	Volumetric Analysis: Acid-Base	**PreLab #6** **Report #5**
Week 3	Chapter 6: Thermo-chemistry Chapter 7: Quantum Theory **Exam 3**	Chapter 6 Guided Notes **ALEKS Module 3A** Chapter 7 Guided Notes **ALEKS Module 3B** **ALEKS Module 3C**	18	Hot and Cold Packs	**Report #6**
			7	Calorimetry: Energy Flow	**PreLab #7** **Report #18**
			8	Hess's Law	**PreLab #8** **Report #7**
Week 4	Chapter 8: Electron Configuration Chapter 9 Bonding Models Chapter 10 Molecular Shapes **Exam 4**	Chapter 8 Guided Notes **ALEKS Module 4A** Chapter 9 Guided Notes **ALEKS Module 4**B Chapter 10 Guided Notes **ALEKS Module 4C**	9	Beer's Law: How Much Dye is in Your Sports Drink?	**PreLab #9** **Report #8**
			10	Molecular Geometry: The VSEPR Theory, Bonding, and Polarity	**PreLab #10** **Report #9**
			11	Molecular Polarity and Chromatography	**PreLab #11** **Report #10**
Week 5	Chapter 11: Bond Theories Chapter 5: Gases **Final Exam**	Chapter 11 Guided Notes Chapter 5 Guided Notes **ALEKS Module 5**	**LP**	**LAB PRACTICAL** **Experiments 1-11**	**Report #11**
			12	Valence Bond Theory	**PreLab #12**
			13	Boyle's Law (handout) Complete ALEKS Modules	**Report #12** **Boyle's Law**