

1/7/2025

DATE

MSD DIVISION

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REQUIRED COURSE

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NEW COURSE

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ELECTIVE COURSE

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REVISION

Lake Land College

Course Information Form

COURSE NUMBER:	CHM-150	TITLE: (30 Characters Max)		General Chemistry I							
SEM CR HRS:	4	Lecture:	3	Lab:	3			ECH:	6		
Course Level:	<input checked="" type="checkbox"/> Gen Ed / IAI	<input type="checkbox"/> Career/Technical		Clinical Practicum:	0	Work-based Learning:	0	WBL ECH:	0		
	<input type="checkbox"/> Baccalaureate /Non-IAI	<input type="checkbox"/> Dev Ed/ Not in Degree Audit									
COURSE PCS #	11 - 40.0501		IAI Code	P1 902L, CHM 911		Contact Hours (Minutes/Week)					
Repeatable (Y/N):	N	Pass/Fail (Y/N):	N	Variable Credit (Y/N):	N	Min:	Max:	16 Wks	300	8 Wks	600
Prerequisites:	High School Chemistry or CHM-111 or consent of Division Chair or Instructor										
Corequisites:	None										
Catalog Description: (40 Word Limit)	General principles of chemistry for students majoring in chemistry, engineering or science professions. Topics include atomic theory, bonding, stoichiometry, gas laws and thermochemistry.										

List the Major Course Segments (Units)	Contact Lecture Hours	Contact Lab Hours	Clinical Practicum	Work-based Learning
Measurements and units	4	6		
Atoms, elements and matter	4	6		
Molecules and compounds	4	6		
Solutions and aqueous reactions	6	6		
Gases	4	3		
Thermochemistry	5	3		
Electronic structure of atoms and periodic properties	7	3		
Chemical reactions and stoichiometry	4	9		
Chemical bonding	7	3		
TOTAL	45	45	0	0

EVALUATION			
QUIZZES <input checked="" type="checkbox"/>	EXAMS <input checked="" type="checkbox"/>	ORAL PRES <input type="checkbox"/>	PAPERS <input type="checkbox"/>
LAB WORK <input checked="" type="checkbox"/>	PROJECTS <input type="checkbox"/>	COMP FINAL <input checked="" type="checkbox"/>	OTHER <input type="checkbox"/>

COURSE MATERIALS	
TITLE:	Chemistry: Structure and Properties
AUTHOR:	Nivaldo Tro
PUBLISHER:	Pearson
VOLUME/EDITION/URL:	2nd edition
COPYRIGHT DATE:	2018

MAJOR COURSE SEGMENT	HOURS	LEARNING OUTCOMES <i>The student will be able to:</i>
Measurements and units	10	1. Identify units as English, metric or SI. 2. Express measurements with the correct number of significant figures. 3. Convert units.
Atoms, elements and matter	10	1. Classify matter. 2. Summarize Dalton's Atomic Theory. 3. Categorize elements on the periodic table. 4. Generate and interpret nuclear symbols. 5. Utilize atomic mass and Avogadro's number.
Molecules and compounds	10	1. Recall compound names and formulas. 2. Differentiate between the types of compound formulas. 3. Predict compound formulas from physical data. 4. Utilize molar mass and formulas in stoichiometric calculations.
Solutions and aqueous reactions	12	1. Define and calculate molarity. 2. Solve solution stoichiometry problems. 3. Classify aqueous reactions as precipitation, acid-base, and redox reactions. 4. Predict the outcomes of aqueous reactions.
Gases	7	1. Describe the various gas laws. 2. Solve all types of gas law problems. 3. Integrate gas laws into stoichiometry. 4. Summarize Kinetic Molecular Theory.

Thermochemistry	8	<ol style="list-style-type: none"> 1. Summarize the First Law of Thermodynamics. 2. Calculate heat, work and internal energy. 3. Solve heat transfer problems including calorimetry. 4. Calculate enthalpy changes and integrate them into reaction stoichiometry.
Electronic structure of atoms and periodic properties	10	<ol style="list-style-type: none"> 1. Organize elements using periodic properties. 2. Perform various energy, frequency and wavelength calculations. 3. Distinguish between the complementary properties of photons and electrons. 4. Represent electrons using quantum numbers. 5. Produce electron configurations and orbital diagrams.
Chemical reactions and stoichiometry	13	<ol style="list-style-type: none"> 1. Categorize chemical and physical changes/properties. 2. Demonstrate the writing and balancing of equations. 3. Perform reaction stoichiometry calculations. 4. Predict the limiting reactant, theoretical yield and percent yield of a chemical reaction.
Chemical bonding	10	<ol style="list-style-type: none"> 1. Describe basic bonding theories for covalent and ionic compounds. 2. Represent molecules and ions as Lewis Structures. 3. Deduce the existence of resonance in molecules. 4. Predict the geometry, polarity and hybridization of compounds and ions.
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Outcomes*	At the successful completion of this course, students will be able to:
Course Outcome 1	Predict properties and structure of atoms, ions and molecules.
Course Outcome 2	Demonstrate proficiency in all types of dimensional analysis and stoichiometric calculations.
Course Outcome 3	Determine physical chemistry outcomes associated with energy and gas laws.
Course Outcome 4	Demonstrate general chemical literacy.
Course Outcome 5	Formulate conclusions based on the acquisition and utilization of data points in the laboratory.
Primary Laker Learning Competency	Quantitative Literacy: Students utilize mathematical knowledge to test claims and hypotheses, perform data analysis and recognize patterns in real-life situations.
Secondary Laker Learning Competency	Scientific Literacy: Students identify foundational science concepts and apply the scientific process to real-life situations.

*Course and program outcomes will be used in the software for outcomes assessment and should include at least 1 primary and 1 secondary Laker Learning Competency. Limit to 3-5.