



## *Summer Prep For General Chemistry*

By default, the topics listed below are all available. However, instructors can customize the course to align with their teaching goals using *any* topics from the complete ALEKS curriculum.

Curriculum Show All (161 topics + 672 additional topics)

- Math and Algebra (54 topics)
  - ◆ Mathematics (18 topics)
    - ◇ Integer multiplication and division
    - ◇ Simplifying a fraction
    - ◇ Equivalent fractions
    - ◇ Signed fraction addition or subtraction: Basic
    - ◇ Signed fraction multiplication: Basic
    - ◇ Signed fraction division
    - ◇ Exponents and fractions
    - ◇ Introduction to inequalities
    - ◇ Writing expressions using exponents
    - ◇ Introduction to exponents
    - ◇ Introduction to order of operations
    - ◇ Ordering numbers with positive exponents
    - ◇ Evaluating expressions with exponents of zero
    - ◇ Evaluating an expression with a negative exponent: Whole number base
    - ◇ Evaluating an expression with a negative exponent: Positive fraction base
    - ◇ Complex fraction without variables: Problem type 1
    - ◇ Square root of a perfect square
    - ◇ Introduction to square root multiplication
  - ◆ Algebra Expressions (20 topics)
    - ◇ Evaluating a quadratic expression: Integers
    - ◇ Combining like terms: Integer coefficients
    - ◇ Combining like terms in a quadratic expression
    - ◇ Distributive property: Integer coefficients
    - ◇ Using distribution and combining like terms to simplify: Univariate
    - ◇ Introduction to the product rule of exponents
    - ◇ Product rule with positive exponents: Univariate
    - ◇ Introduction to the product rule with negative exponents
    - ◇ Introduction to the quotient rule of exponents
    - ◇ Simplifying a ratio of univariate monomials
    - ◇ Quotient rule with negative exponents: Problem type 1
    - ◇ Introduction to the power of a product rule of exponents
    - ◇ Power and quotient rules with positive exponents
    - ◇ Squaring a binomial: Univariate
    - ◇ Multiplying binomials with leading coefficients greater than 1
    - ◇ Multiplying rational expressions involving multivariate monomials
    - ◇ Complex fraction involving univariate monomials
    - ◇ Square root of a perfect square monomial
    - ◇ Writing a one-step expression for a real-world situation

- ◇ Writing a multi–step equation for a real–world situation
- ◆ Linear Equations (12 topics)
  - ◇ Identifying solutions to a linear equation in one variable: Two–step equations
  - ◇ Identifying solutions to a linear equation in two variables
  - ◇ Additive property of equality with integers
  - ◇ Additive property of equality with a negative coefficient
  - ◇ Multiplicative property of equality with signed fractions
  - ◇ Solving a multi–step equation given in fractional form
  - ◇ Solving a linear equation with several occurrences of the variable: Fractional forms with monomial numerators
  - ◇ Solving a rational equation that simplifies to linear: Denominator  $x+a$
  - ◇ Solving a proportion of the form  $a/(x+b) = c/x$
  - ◇ Solving for a variable in terms of other variables using addition or subtraction with division
  - ◇ Solving for a variable in terms of other variables in a linear equation with fractions
  - ◇ Solving a word problem with two unknowns using a linear equation
- ◆ Quadratic and Radical Equations (4 topics)
  - ◇ Solving a quadratic equation using the square root property: Decimal answers, basic
  - ◇ Solving a quadratic equation using the square root property: Decimal answers, advanced
  - ◇ Applying the quadratic formula: Decimal answers
  - ◇ Introduction to solving a radical equation
- Graphing (15 topics)
  - ◆ Graphing Equations (7 topics)
    - ◇ Classifying slopes given graphs of lines
    - ◇ Graphing a line given its equation in slope–intercept form: Fractional slope
    - ◇ Writing the equation of a line given the  $y$ –intercept and another point
    - ◇ Graphing a line through a given point with a given slope
    - ◇ Finding slope given the graph of a line on a grid
    - ◇ Finding slope given two points on a line
    - ◇ Finding  $x$ – and  $y$ –intercepts given the graph of a line on a grid
  - ◆ Graphing Data (8 topics)
    - ◇ Constructing a scatter plot
    - ◇ Sketching the line of best fit
    - ◇ Scatter plots and correlation
    - ◇ Approximating the equation of a line of best fit and making predictions
    - ◇ Choosing a graph to fit a narrative: Basic
    - ◇ Choosing a graph to fit a narrative: Advanced
    - ◇ Constructing a histogram for numerical data
    - ◇ Mean of a data set
- Advanced Math (4 topics)
  - ◆ Logarithms and Exponentials (4 topics)
    - ◇ Evaluating a logarithmic expression
    - ◇ Solving an equation of the form  $\log_b a = c$
    - ◇ Evaluating an exponential function with base  $e$  that models a real–world situation
    - ◇ Solving an exponential equation by using logarithms: Decimal answers, basic
- Physics (9 topics)
  - ◆ Force and Energy (2 topics)
    - ◇ Calculating gravitational potential energy
    - ◇ Using conservation of energy with gravitational potential energy
  - ◆ Electrostatics (7 topics)
    - ◇ Understanding that opposite charges attract and like charges repel
    - ◇ Understanding net electrical charge
    - ◇ Understanding how electrostatic force scales with charge and separation
    - ◇ Understanding how electrostatic forces cancel

- ◇ Understanding that electrostatic forces add as vectors
- ◇ Understanding how electrostatic energy scales with charge and separation
- ◇ Sketching polarization induced by a nearby charge
- Measurement (31 topics)
  - ◆ Scientific Notation (4 topics)
    - ◇ Multiplication of a decimal by a power of ten
    - ◇ Division of a decimal by a power of ten
    - ◇ Converting between decimal numbers and numbers written in scientific notation
    - ◇ Multiplying and dividing numbers written in scientific notation
  - ◆ SI Units (7 topics)
    - ◇ Knowing the dimension of common scientific units of measurement
    - ◇ Understanding the purpose of SI prefixes
    - ◇ Knowing the value of an SI prefix as a power of 10
    - ◇ Interconversion of prefixed and base SI units
    - ◇ Interconversion of prefixed SI units
    - ◇ Interconverting compound SI units
    - ◇ Interconverting temperatures in Celsius and Kelvins
  - ◆ Measurement Math (2 topics)
    - ◇ Simplifying unit expressions
    - ◇ Multiplication and division of measurements
  - ◆ Measurement Uncertainty (8 topics)
    - ◇ Counting significant digits
    - ◇ Rounding to a given significant digit
    - ◇ Counting significant digits when measurements are added or subtracted
    - ◇ Counting significant digits when measurements are multiplied or divided
    - ◇ Adding or subtracting and multiplying or dividing measurements
    - ◇ Reading a measurement from an analog instrument
    - ◇ Distinguishing accuracy and precision
    - ◇ Calculating absolute and relative error
  - ◆ Quantitative Problem Solving (10 topics)
    - ◇ Setting up a one-step unit conversion
    - ◇ Setting up a unit reprefix conversion
    - ◇ Setting up a unit conversion
    - ◇ Predicting the units of the solution to a basic quantitative problem
    - ◇ Deducing the unit missing from the solution to a basic quantitative problem
    - ◇ Setting up the solution to a basic quantitative problem
    - ◇ Identifying errors in the solution to a basic quantitative problem
    - ◇ Setting up the math for a one-step quantitative problem
    - ◇ Setting up the math for a one-step problem with unit conversion
    - ◇ Setting up the math for a two-step quantitative problem
- Matter (20 topics)
  - ◆ Mass, Volume and Density (6 topics)
    - ◇ Estimating the volume in liters of a square prism object
    - ◇ Finding the side length of a cube from its volume in liters
    - ◇ Understanding the relationship between mass, volume, and density
    - ◇ Calculating mass density
    - ◇ Using mass density to find mass or volume
    - ◇ Solving applied density problems
  - ◆ Substances (2 topics)
    - ◇ Naming common laboratory separation techniques
    - ◇ Distinguishing extensive and intensive properties
  - ◆ Atomic Theory (5 topics)
    - ◇ Distinguishing elements and compounds

- ◇ Distinguishing compounds and mixtures
- ◇ Classifying substances from a sketch
- ◇ Distinguishing chemical and physical change
- ◇ Distinguishing solid, liquid and gas phases of a pure substance
- ◆ Chemical Elements (7 topics)
  - ◇ Names and symbols of important elements
  - ◇ Reading a Periodic Table entry
  - ◇ Understanding periods and groups of the Periodic Table
  - ◇ Recognizing element families
  - ◇ Organization of the Periodic Table
  - ◇ Standard chemical and physical states of the elements
  - ◇ Using the Periodic Table to identify similar elements
- Atoms, Ions and Molecules (14 topics)
  - ◆ Atomic Structure (6 topics)
    - ◇ Identifying the parts of an atom
    - ◇ Counting protons and electrons in atoms and atomic ions
    - ◇ Finding isoelectronic atoms
    - ◇ Predicting the ions formed by common main-group elements
    - ◇ Counting valence electrons in a neutral atom
    - ◇ Counting the electron shells in a neutral atom
  - ◆ Chemical Compounds (3 topics)
    - ◇ Counting the number of atoms in a formula unit
    - ◇ Writing a chemical formula given a molecular model
    - ◇ Writing a chemical formula given a chemical structure
  - ◆ Ionic Compounds (5 topics)
    - ◇ Predicting the formula of binary ionic compounds
    - ◇ Deducing the ions in a binary ionic compound from its empirical formula
    - ◇ Identifying common polyatomic ions
    - ◇ Predicting the formula of ionic compounds with common polyatomic ions
    - ◇ Deducing the ions in a polyatomic ionic compound from its empirical formula
- Stoichiometry (14 topics)
  - ◆ Moles and Molar Mass (2 topics)
    - ◇ Calculating and using the molar mass of elements
    - ◇ Finding molar mass from chemical formulae
  - ◆ Elemental Analysis (2 topics)
    - ◇ Finding mass percent from chemical formulae
    - ◇ Solving applied mass percent problems
  - ◆ Chemical Equations (4 topics)
    - ◇ Stoichiometric coefficients
    - ◇ Balancing chemical equations with noninterfering coefficients
    - ◇ Balancing chemical equations with interfering coefficients
    - ◇ Writing a chemical equation from a molecular model
  - ◆ Reaction Stoichiometry (1 topics)
    - ◇ Using a chemical equation to find moles of product from moles of reactant
  - ◆ Solution Stoichiometry (5 topics)
    - ◇ Calculating molarity using solute moles
    - ◇ Using molarity to find solute moles and solution volume
    - ◇ Calculating molarity using solute mass
    - ◇ Using molarity to find solute mass and solution volume
    - ◇ Dilution
- Other Topics Available(\*) (672 additional topics)

- ◆ Math and Algebra (6 topics)
  - ◇ Absolute value of a number
  - ◇ Rewriting an algebraic expression without a negative exponent
  - ◇ Additive property of inequality with integers
  - ◇ Solving a two–step linear inequality: Problem type 2
  - ◇ Discriminant of a quadratic equation
  - ◇ Solving a radical equation that simplifies to a linear equation: One radical, basic
- ◆ Graphing (7 topics)
  - ◇ Finding the slope and y–intercept of a line given its equation in the form  $Ax + By = C$
  - ◇ Finding x– and y–intercepts of a line given the equation: Advanced
  - ◇ Classifying linear and nonlinear relationships from scatter plots
  - ◇ Linear relationship and the correlation coefficient
  - ◇ Finding the mean of a symmetric distribution
  - ◇ Population standard deviation
  - ◇ Word problem involving calculations from a normal distribution
- ◆ Advanced Math (21 topics)
  - ◇ Basic properties of logarithms
  - ◇ Expanding a logarithmic expression: Problem type 1
  - ◇ Expanding a logarithmic expression: Problem type 2
  - ◇ Writing an expression as a single logarithm
  - ◇ Converting between common logarithmic and exponential equations
  - ◇ Converting between natural logarithmic and exponential equations
  - ◇ Solving a multi–step equation involving natural logarithms
  - ◇ Solving an exponential equation by using natural logarithms: Decimal answers
  - ◇ Graphing an exponential function and its asymptote:  $f(x) = a(e)^{x-b} + c$
  - ◇ Finding an angle measure of a triangle given two angles
  - ◇ Finding an angle measure for a triangle with an extended side
  - ◇ Finding an angle measure for a triangle sharing a side with another triangle
  - ◇ Pythagorean Theorem
  - ◇ Sine, cosine, and tangent ratios: Numbers for side lengths
  - ◇ Using the Pythagorean Theorem to find a sine, cosine, or tangent ratio in a right triangle
  - ◇ Using a trigonometric ratio to find a side length in a right triangle
  - ◇ Using a trigonometric ratio to find an angle measure in a right triangle
  - ◇ Solving a right triangle
  - ◇ Finding the magnitude and direction of a vector given its graph
  - ◇ Finding the components of a vector given its graph
  - ◇ Finding the component of a vector along another vector
- ◆ Physics (4 topics)
  - ◇ Using conservation of energy with electrostatic potential energy
  - ◇ Understanding how electrostatic potential energy scales with charge and separation
  - ◇ Calculating the magnitude of an electrostatic force using Coulomb's Law
  - ◇ Calculating electrostatic energy using Coulomb's Law
- ◆ Measurement (10 topics)
  - ◇ Calculating positive powers of scientific notation
  - ◇ Finding negative powers of scientific notation
  - ◇ Interconverting derived SI units
  - ◇ Interconverting whole degree temperatures in Celsius and kelvins
  - ◇ Interconverting temperatures in Celsius and Fahrenheit
  - ◇ Addition and subtraction of measurements
  - ◇ One step dosage calculations
  - ◇ Dosage calculations using patient weight
  - ◇ Dosage rate calculations
  - ◇ Naming components of the scientific method

- ◆ Matter (8 topics)
  - ◇ Estimating the volume in liters of a spherical object
  - ◇ Estimating the volume in liters of a cylindrical object
  - ◇ Calculating volume by combining the volume of simple shapes
  - ◇ Distinguishing mixtures from pure substances through physical properties
  - ◇ Distinguishing physical and chemical properties by a macroscopic description
  - ◇ Using the Law of Constant Composition
  - ◇ Using the Law of Multiple Proportions
  - ◇ Distinguishing a metal from a nonmetal by physical properties
- ◆ Atoms, Ions and Molecules (20 topics)
  - ◇ Counting the number of protons and electrons in a neutral atom
  - ◇ Finding isoprotonic atoms
  - ◇ Isotopes
  - ◇ Finding atomic mass from isotope mass and natural abundance
  - ◇ Finding isotope mass or natural abundance from atomic mass
  - ◇ Counting valence electrons in an atomic ion
  - ◇ Drawing the Lewis dot diagram of a main group atom or common atomic ion
  - ◇ Understanding the difference between a molecular and empirical formula
  - ◇ Understanding the prefixes used in naming binary compounds
  - ◇ Naming binary covalent compounds
  - ◇ Predicting whether a compound is ionic or molecular
  - ◇ Distinguishing an ionic from a molecular compound by physical properties
  - ◇ Naming binary ionic compounds
  - ◇ Deducing the empirical formula of a binary ionic compound from its name
  - ◇ Predicting ionic compounds formed by two elements
  - ◇ Predicting and naming ionic compounds formed by two elements
  - ◇ Naming ionic compounds with common polyatomic ions
  - ◇ Identifying oxoanions
  - ◇ Naming ionic compounds with common oxoanions
  - ◇ Naming hydrates
- ◆ Stoichiometry (24 topics)
  - ◇ Using the Avogadro Number
  - ◇ Calculating and using the molar mass of diatomic elements
  - ◇ Calculating and using the molar mass of heterodiatomc compounds
  - ◇ Finding mole ratios from chemical formulae
  - ◇ Finding chemical formulae from a mole ratio
  - ◇ Interconverting number of atoms and mass of compound
  - ◇ Elemental analysis of binary compounds
  - ◇ Elemental analysis
  - ◇ Finding a molecular formula from molar mass and elemental analysis of binary compounds
  - ◇ Finding a molecular formula from molar mass and elemental analysis
  - ◇ Combustion analysis
  - ◇ Writing a chemical equation from a description of the reaction
  - ◇ Writing the net equation for a sequence of reactions
  - ◇ Solving for a reactant using a chemical equation
  - ◇ Identifying the limiting reactant in a drawing of a mixture
  - ◇ Solving moles-to-moles limiting reactant problems
  - ◇ Limiting reactants
  - ◇ Understanding theoretical, actual, and percent yield
  - ◇ Theoretical yield of chemical reactions
  - ◇ Percent yield of chemical reactions
  - ◇ Reaction sequence stoichiometry
  - ◇ Calculating ion molarity using solute mass

- ◇ Solving for a reactant in solution
- ◇ Solving limiting reactant problems in solution
- ◆ Simple Reactions (22 topics)
  - ◇ Predicting the products of dissolution
  - ◇ Identifying the correct sketch of a compound in aqueous solution
  - ◇ Writing net ionic equations
  - ◇ Predicting precipitation
  - ◇ Identifying acids and bases by their chemical formula
  - ◇ Predicting the products of a neutralization reaction
  - ◇ Determining the volume of base needed to titrate a given mass of acid
  - ◇ Determining the molar mass of an acid by titration
  - ◇ Standardizing a base solution by titration
  - ◇ Assigning oxidation numbers
  - ◇ Recognizing reduction and oxidation
  - ◇ Identifying oxidizing and reducing agents
  - ◇ Identifying oxidized and reduced reactants in a metal–nonmetal reaction
  - ◇ Identifying oxidized and reduced reactants in a single–displacement reaction
  - ◇ Predicting whether simple electrochemical reactions happen
  - ◇ Solving a redox titration problem
  - ◇ Identifying combination, decomposition, single and double displacement reactions
  - ◇ Identifying precipitation, combustion and acid–base reactions
  - ◇ Predicting the products of a combustion reaction
  - ◇ Predicting the products of a single displacement reaction involving hydrogen
  - ◇ Predicting the products of a gas–evolving double displacement reaction
  - ◇ Predicting products from a general statement about reactivity
- ◆ Thermochemistry (23 topics)
  - ◇ Understanding how kinetic energy scales with mass and speed
  - ◇ Calculating kinetic energy
  - ◇ Using conservation of energy to predict the qualitative exchange of kinetic and potential energy
  - ◇ Calculating pressure–volume work
  - ◇ Understanding the definitions of heat and work
  - ◇ Understanding the definition of enthalpy
  - ◇ Interconverting calories and joules
  - ◇ Calculating specific heat capacity
  - ◇ Using specific heat capacity to find heat
  - ◇ Using specific heat capacity to find temperature change
  - ◇ Calculating molar heat capacity
  - ◇ Solving a basic calorimetry problem
  - ◇ Finding the equilibrium temperature when substances at different temperatures mix
  - ◇ Using the general properties of reaction enthalpy
  - ◇ Calculating the heat of reaction from molar reaction enthalpy and the mass of a reactant
  - ◇ Calculating heat of reaction from constant–pressure calorimetry data
  - ◇ Calculating heat of reaction from bomb calorimetry data
  - ◇ Using Hess's Law to calculate net reaction enthalpy
  - ◇ Writing a standard formation reaction
  - ◇ Calculating a molar heat of reaction from formation enthalpies
  - ◇ Solving combustion thermochemistry problems
  - ◇ Calculating the heat of reaction from bond energies and Lewis structures
  - ◇ Calculating the heat of reaction from bond energies
- ◆ Electronic Structure and Chemical Bonding (73 topics)
  - ◇ Understanding the meaning of a de Broglie wavelength
  - ◇ Finding the minimum uncertainty in a position or velocity measurement
  - ◇ Interpreting the radial probability distribution of an orbital

- ◇ Interpreting the angular probability distribution of an orbital
- ◇ Recognizing s and p orbitals
- ◇ Deducing n and l from a subshell label
- ◇ Deciding the relative energy of electron subshells
- ◇ Drawing a box diagram of the electron configuration of an atom
- ◇ Deducing the allowed quantum numbers of an atomic electron
- ◇ Calculating the capacity of electron subshells
- ◇ Knowing the subshells of an electron shell
- ◇ Interpreting the electron configuration of a neutral atom
- ◇ Interpreting the electron configuration of a neutral atom in noble-gas notation
- ◇ Writing the electron configuration of a neutral atom with s and p electrons only
- ◇ Writing the electron configuration of a neutral atom with a filled d subshell
- ◇ Interpreting the electron configuration of an atom or atomic ion
- ◇ Interpreting the electron configuration of an atom or atomic ion in noble-gas notation
- ◇ Writing the electron configuration of an atom or atomic ion with s and p electrons only
- ◇ Writing the electron configuration of an atom using the Periodic Table
- ◇ Identifying quantum mechanics errors in electron configurations
- ◇ Identifying the electron added or removed to form an ion from an s or p block atom
- ◇ Identifying the electron added or removed to form an ion
- ◇ Identifying s, p, d and f block elements
- ◇ Identifying elements with a similar valence electron configuration
- ◇ Understanding the definitions of ionization energy and electron affinity
- ◇ Predicting the relative ionization energy of elements
- ◇ Deducing valence electron configuration from trends in successive ionization energies
- ◇ Ranking the screening efficacy of atomic orbitals
- ◇ Understanding periodic trends in effective nuclear charge
- ◇ Deducing the block of an element from an electron configuration
- ◇ Understanding periodic trends in atomic size
- ◇ Understanding periodic trends in atomic ionizability
- ◇ Understanding the organization of the electromagnetic spectrum
- ◇ Interconverting the wavelength and frequency of electromagnetic radiation
- ◇ Interconverting wavelength, frequency and photon energy
- ◇ Calculating the wavelength of a spectral line from an energy diagram
- ◇ Predicting the qualitative features of a line spectrum
- ◇ Calculating the wavelength of a line in the spectrum of hydrogen
- ◇ Counting bonding and nonbonding electron pairs in a Lewis structure
- ◇ Counting electron pairs in a Lewis structure with double or triple bonds
- ◇ Counting valence electrons in a molecule or polyatomic ion
- ◇ Deciding whether a Lewis structure satisfies the octet rule
- ◇ Writing Lewis structures for diatomic molecules
- ◇ Predicting the single-bonded molecular compounds formed by two elements
- ◇ Predicting the compound formed by two main group elements
- ◇ Calculating formal charge
- ◇ Writing Lewis structures for a molecule with one central atom and no octet-rule exceptions
- ◇ Recognizing exceptions to the octet rule
- ◇ Writing Lewis structures for an expanded valence shell central atom
- ◇ Writing the Lewis structures for a molecule with resonance
- ◇ Drawing Lewis structures for simple organic compounds
- ◇ Predicting the relative electronegativities of atoms
- ◇ Predicting bond polarity
- ◇ Predicting relative bond polarity
- ◇ Predicting the relative ionic character of chemical bonds
- ◇ Predicting the relative length and energy of chemical bonds



- ◇ Predicting the arrangement of electron groups around the central atom of a molecule
- ◇ Identifying a molecule with one central atom from its 3D shape
- ◇ Using the AXE notation to describe a molecule with a central atom
- ◇ Naming the shape of molecules with one central atom and no octet–rule exceptions
- ◇ Predicting bond angles in molecules with one central atom and no octet–rule exceptions
- ◇ Predicting bond angles in a small organic molecule
- ◇ Predicting and naming the shape of molecules with a central atom
- ◇ Predicting deviations from ideal bond angles
- ◇ Predicting whether molecules are polar or nonpolar
- ◇ Naming common chemical groups
- ◇ Identifying common chemical groups in a Lewis structure
- ◇ Identifying hybridization in a small molecule
- ◇ Counting sigma and pi bonds in a small molecule
- ◇ Identifying carbon hybridization in simple organic molecules
- ◇ Recognizing typical LCAO molecular orbitals
- ◇ Drawing the MO energy diagram for a Period 2 homodiatom
- ◇ Using the MO model to predict bond order and paramagnetism
- ◆ Gases (27 topics)
  - ◇ Interconverting pressure and force
  - ◇ Interconverting atmospheres and kilopascals
  - ◇ Interconverting atmospheres and torr
  - ◇ Understanding pressure equilibrium and atmospheric pressure
  - ◇ Understanding Boyle's Law
  - ◇ Solving applications of Boyle's Law
  - ◇ Using Charles's Law
  - ◇ Using the combined gas law
  - ◇ Using Avogadro's Law
  - ◇ Using the ideal equation of state
  - ◇ Interconverting molar mass and density of ideal gases
  - ◇ Calculating partial pressure of a gas from a sketch
  - ◇ Calculating mole fraction in a gas mixture
  - ◇ Calculating partial pressure in a gas mixture
  - ◇ Calculating the mass of a gas collected over water
  - ◇ Solving for a gaseous reactant
  - ◇ Understanding how average molecular kinetic energy scales with temperature
  - ◇ Understanding how average molecular speed scales with temperature and molar mass
  - ◇ Interpreting a graph of molecular speed distribution
  - ◇ Predicting how molecular speed distribution changes with temperature and molar mass
  - ◇ Calculating average molecular speed
  - ◇ Understanding how molecular collision rate scales with temperature and volume
  - ◇ Using relative effusion rates to find an unknown molar mass
  - ◇ Using thermodynamic state to order the ideality of gases
  - ◇ Identifying the origin of nonideality in a gas
  - ◇ Understanding the origin of the van der Waals equation of state
  - ◇ Using the van der Waals equation of state
- ◆ Advanced General Chemistry (256 topics)
  - ◇ Identifying a molecule from its electrostatic potential map
  - ◇ Predicting the strength of intermolecular forces from an electrostatic potential map
  - ◇ Identifying hydrogen–bonding interactions between molecules
  - ◇ Identifying the intermolecular forces between atoms, ions and molecules
  - ◇ Identifying the important intermolecular forces in pure compounds
  - ◇ Predicting the relative strength of the dispersion force between molecules
  - ◇ Predicting the relative boiling points of pure substances

- ◇ Identifying important physical properties of liquids
- ◇ Understanding consequences of important physical properties of liquids
- ◇ Relating vapor pressure to vaporization
- ◇ Understanding the connection between vapor pressure, boiling point, and enthalpy of vaporization
- ◇ Calculating vapor pressure from boiling point and enthalpy of vaporization
- ◇ Calculating enthalpy of vaporization from vapor pressure
- ◇ Predicting the type of solid formed by a compound
- ◇ Predicting the relative stability of ionic crystals from a sketch
- ◇ Predicting the relative lattice energy of binary ionic compounds
- ◇ Interpreting a Born–Haber cycle
- ◇ Drawing the unit cell of a 2D lattice
- ◇ Counting the atoms in a unit cell
- ◇ Recognizing and naming close–packed crystal lattices
- ◇ Recognizing and naming lattices with cubic unit cells
- ◇ Calculating key distances in the fcc unit cell
- ◇ Calculating key distances in the bcc unit cell
- ◇ Finding an atomic radius from an fcc or bcc lattice constant
- ◇ Finding density from an fcc or bcc lattice constant
- ◇ Using heat of fusion or vaporization to find the heat needed to melt or boil a substance
- ◇ Using a phase diagram to predict phase at a given temperature and pressure
- ◇ Labeling a typical simple phase diagram
- ◇ Using a phase diagram to find a phase transition temperature or pressure
- ◇ Sketching a described thermodynamic change on a phase diagram
- ◇ Identifying phase transitions on a heating curve
- ◇ Interpreting a heating curve
- ◇ Drawing a heating curve
- ◇ Calculating mass percent composition
- ◇ Using mass percent composition to find solution volume
- ◇ Calculating volume percent composition
- ◇ Finding mass or volume from percent concentration
- ◇ Calculating ionic solution composition in equivalents
- ◇ Solving applied equivalents composition problems
- ◇ Calculating molality
- ◇ Calculating mole fraction
- ◇ Calculating mass concentration
- ◇ Using mass concentration to find solute mass and solution volume
- ◇ Solving applied mass concentration problems
- ◇ Solving applied dilution problems
- ◇ Applying like dissolves like
- ◇ Calculating solubility
- ◇ Using solubility to calculate solute mass or solution volume
- ◇ Understanding how solubility varies with temperature and pressure
- ◇ Understanding conceptual components of the enthalpy of solution
- ◇ Using Henry's Law to calculate the solubility of a gas
- ◇ Predicting the relative heat of hydration of ions
- ◇ Predicting relative boiling point elevations and freezing point depressions
- ◇ Using the  $K_f$  and  $K_b$  equations
- ◇ Using the  $K_f$  and  $K_b$  equations with electrolytes
- ◇ Calculating and using the van't Hoff factor for electrolytes
- ◇ Using osmotic pressure to find molar mass
- ◇ Using a solution freezing point to calculate a molar mass
- ◇ Using Raoult's Law to calculate the vapor pressure of a component
- ◇ Calculating ideal solution composition after a distillation

- ◇ Predicting how reaction rate varies with pressure, concentration and temperature
- ◇ Calculating the reaction rate of one reactant from that of another
- ◇ Calculating average and instantaneous reaction rate from a graph of concentration versus time
- ◇ Using a rate law
- ◇ Using reactant reaction order to predict changes in initial rate
- ◇ Deducing a rate law from initial reaction rate data
- ◇ Calculating the change in concentration after a whole number of half-lives of a first-order reaction
- ◇ Using a zero order integrated rate law to find concentration change
- ◇ Using an integrated rate law for a first-order reaction
- ◇ Using a second-order integrated rate law to find concentration change
- ◇ Using first- and second-order integrated rate laws
- ◇ Deducing a rate law from the change in concentration over time
- ◇ Finding half life and rate constant from a graph of concentration versus time
- ◇ Solving applied problems with first-order kinetics
- ◇ Interpreting a reaction energy diagram
- ◇ Relating activation energy to reaction rate
- ◇ Drawing the reaction energy diagram of a catalyzed reaction
- ◇ Understanding the qualitative predictions of the Arrhenius equation
- ◇ Using the Arrhenius equation to calculate  $k$  at one temperature from  $k$  at another
- ◇ Using the Arrhenius equation to calculate  $E_a$  from  $k$  versus  $T$  data
- ◇ Identifying the molecularity of an elementary reaction
- ◇ Identifying intermediates in a reaction mechanism
- ◇ Writing a plausible missing step for a simple reaction mechanism
- ◇ Writing the rate law of an elementary reaction
- ◇ Writing the rate law implied by a simple mechanism with an initial slow step
- ◇ Expressing the concentration of an intermediate in terms of the concentration of reactants
- ◇ Writing the rate law implied by a simple mechanism
- ◇ Deducing information about reaction mechanisms from a reaction energy diagram
- ◇ Understanding that no reaction goes to 100% completion
- ◇ Predicting relative forward and reverse rates of reaction in a dynamic equilibrium
- ◇ Using Le Chatelier's Principle to predict the result of changing concentration
- ◇ Using Le Chatelier's Principle to predict the result of changing temperature
- ◇ Writing a concentration equilibrium constant expression
- ◇ Writing a pressure equilibrium constant expression
- ◇ Writing the concentration equilibrium expression for a heterogeneous equilibrium
- ◇ Writing the pressure equilibrium expression for a heterogeneous equilibrium
- ◇ Calculating an equilibrium constant from an equilibrium composition
- ◇ Calculating an equilibrium constant from a heterogeneous equilibrium composition
- ◇ Using an equilibrium constant to predict the direction of spontaneous reaction
- ◇ Using the general properties of equilibrium constants
- ◇ Interconverting  $K_p$  and  $K_c$
- ◇ Writing an equilibrium constant for a reaction sequence
- ◇ Recognizing equilibrium from a sketch
- ◇ Predicting equilibrium composition from a sketch
- ◇ Setting up a reaction table
- ◇ Calculating equilibrium composition from an equilibrium constant
- ◇ Using the small  $x$  approximation to solve equilibrium problems
- ◇ Calculating an equilibrium constant from a partial equilibrium composition
- ◇ Calculating an equilibrium composition after a prior equilibrium determines  $K$
- ◇ Solving problems that mix equilibrium ideas with gas laws
- ◇ Using the van't Hoff equation to predict  $K$  at a different temperature
- ◇ Writing a solubility product ( $K_{sp}$ ) expression
- ◇ Using  $K_{sp}$  to calculate the solubility of a compound

- ◇ Using the solubility of a compound to calculate  $K_{sp}$
- ◇ Calculating the solubility of an ionic compound when a common ion is present
- ◇ Understanding the effect of pH on the solubility of ionic compounds
- ◇ Writing a complex ion formation constant expression
- ◇ Using  $K_f$  to calculate the equilibrium molarity of a complex
- ◇ Calculating the solubility of an ionic compound when a complex may form
- ◇ Identifying acids and bases by their reaction with water
- ◇ Understanding the difference between strong and weak acids
- ◇ Identifying Bronsted–Lowry acids and bases
- ◇ Identifying strong or weak acids and bases from a sketch
- ◇ Finding the conjugate of an acid or base
- ◇ Predicting acid or base strength from the conjugate
- ◇ Predicting the products of the reaction of a strong acid with water
- ◇ Predicting the reactants of a neutralization reaction
- ◇ Predicting the qualitative acid–base properties of salts
- ◇ Predicting the qualitative acid–base properties of metal cations
- ◇ Identifying Lewis acids and bases in reactions
- ◇ Predicting the acid–base properties of a binary oxide in water
- ◇ Naming inorganic acids
- ◇ Deducing the formulae of inorganic acids from their names
- ◇ Naming acid salts
- ◇ Recognizing common acids and bases
- ◇ Predicting the relative acidity of binary acids
- ◇ Understanding the effect of induction on acidity
- ◇ Interconverting pH and hydronium ion concentration
- ◇ Interconverting pH and pOH at 25°C
- ◇ Interconverting hydronium and hydroxide concentration at 25°C
- ◇ Making qualitative estimates of pH change
- ◇ Calculating the pH of a strong acid solution
- ◇ Calculating the pH of a strong base solution
- ◇ Diluting a strong acid solution to a given pH
- ◇ Preparing a strong base solution with a given pH
- ◇ Writing an acid dissociation constant expression
- ◇ Determining the strength of acids from a sketch
- ◇ Calculating the  $K_a$  of a weak acid from pH
- ◇ Calculating the pH of a weak acid solution
- ◇ Writing a base protonation constant expression
- ◇ Calculating the pH of a weak base solution
- ◇ Deriving  $K_b$  from  $K_a$
- ◇ Interconverting  $K_a$  and pKa
- ◇ Calculating the pH of a salt solution
- ◇ Calculating percent dissociation of a weak acid
- ◇ Understanding connections between descriptions of weak acid dissociation
- ◇ Calculating the pH of a dilute acid solution
- ◇ Writing the dissociation reactions of a polyprotic acid
- ◇ Solving a polyprotic acid equilibrium composition problem
- ◇ Calculating the pH of a weak acid titrated with a strong base
- ◇ Calculating the pH of a weak base titrated with a strong acid
- ◇ Calculating the pH at equivalence of a titration
- ◇ Identifying the major species in weak acid or weak base equilibria
- ◇ Setting up a reaction table for a pH calculation with a common ion
- ◇ Calculating the pH of a buffer
- ◇ Calculating the composition of a buffer of a given pH

- ◇ Calculating entropy change from reversible heat flow
- ◇ Calculating absolute entropy using the Boltzmann hypothesis
- ◇ Calculating entropy change using the Boltzmann hypothesis
- ◇ Predicting qualitatively how entropy changes with temperature and volume
- ◇ Predicting qualitatively how entropy changes with mixing and separation
- ◇ Qualitatively predicting reaction entropy
- ◇ Using the Second Law to predict spontaneous change
- ◇ Calculating reaction entropy using the standard molar entropies of reactants
- ◇ Using the general properties of Gibbs free energy
- ◇ Calculating  $dG$  from  $dH$  and  $dS$
- ◇ Using the conditions of spontaneity to deduce the signs of  $H$  and  $S$
- ◇ Calculating standard reaction free energy from standard free energies of formation
- ◇ Estimating a phase transition temperature from standard thermodynamic data
- ◇ Interconverting standard Gibbs free energy and  $K$
- ◇ Using thermodynamic data to calculate  $K$
- ◇ Recognizing consistency between statements about standard Gibbs free energy
- ◇ Using the maximum work theorem with chemical work
- ◇ Calculating reaction free energy under nonstandard conditions
- ◇ Using reaction free energy to predict equilibrium composition
- ◇ Writing a simple half-reaction from its description
- ◇ Writing the half-reactions of a metal-nonmetal reaction
- ◇ Writing the half-reactions of a single-displacement reaction
- ◇ Writing and balancing complex half-reactions in acidic solution
- ◇ Writing and balancing complex half-reactions in basic solution
- ◇ Balancing a complex redox equation in acidic or basic solution
- ◇ Writing the half-reactions of a complex redox reaction in acidic or basic solution
- ◇ Designing a galvanic cell from a single-displacement redox reaction
- ◇ Designing a galvanic cell from two half-reactions
- ◇ Analyzing a galvanic cell
- ◇ Picking a reduction or oxidation that will make a galvanic cell work
- ◇ Ranking the strength of oxidizing and reducing agents using standard reduction potentials
- ◇ Calculating standard reaction free energy from standard reduction potentials
- ◇ Recognizing consistency among equilibrium constant, free energy, and cell potential
- ◇ Using the Nernst equation to calculate nonstandard cell voltage
- ◇ Understanding concentration cells
- ◇ Using the relationship between charge, current and time
- ◇ Using the Faraday constant
- ◇ Analyzing the electrolysis of molten salt
- ◇ Calculating the mass of an electrolysis product from the applied current
- ◇ Understanding main-group periodic trends in ionization energy
- ◇ Understanding main-group periodic trends in atomic radius
- ◇ Understanding main-group periodic trends in metallic character
- ◇ Predicting the most positive and negative oxidation states of main-group elements
- ◇ Predicting the common oxidation states of main-group elements
- ◇ Predicting the hydride formed by a main-group element
- ◇ Predicting the oxide formed by a main-group element
- ◇ Identifying a main-block group from its general properties
- ◇ Identifying a main-block group from an element oxide
- ◇ Identifying a main-block group from an element halide
- ◇ Predicting the type of bonding in a main-group element
- ◇ Assessing the consistency of statements relating to main-group valence electron configuration
- ◇ Predicting the products of the reaction of a Group 1A or 2A metal with water
- ◇ Predicting the products of the reaction of a Group 1A or 2A metal with oxygen

- ◇ Predicting the products of the reaction of elements at either end of the Periodic Table
- ◇ Identifying Group 3A elements
- ◇ Identifying Group 4A elements
- ◇ Identifying Group 5A elements
- ◇ Identifying Group 6A elements
- ◇ Understanding the chemical formulae of interhalogens
- ◇ Understanding how halide bond length varies down a main-block group
- ◇ Ordering the melting points of elements at either end of the Periodic Table
- ◇ Ranking the oxidizing power of halogens
- ◇ Writing the electron configuration of a first transition series atom
- ◇ Interpreting an outer electron box diagram
- ◇ Drawing the outer electron box diagram of a transition metal cation
- ◇ Identifying transition metal cations with a given number of d electrons
- ◇ Deducing the number of d electrons and unpaired spins in a transition metal cation
- ◇ Understanding the exceptional electron configurations in the first transition series
- ◇ Understanding words that describe where transition metals lie in the Periodic Table
- ◇ Predicting the relative atomic radius of a transition metal atom
- ◇ Predicting the relative density of a transition metal
- ◇ Predicting the relative melting point of a transition metal
- ◇ Predicting the highest common oxidation state of a metal in the first transition series
- ◇ Predicting the reaction of a transition metal with a strong acid
- ◇ Writing the formula of a metal complex from its description
- ◇ Recognizing typical metal ligands
- ◇ Determining the oxidation state of the metal in a complex ion
- ◇ Naming complex cations with one type of ligand
- ◇ Naming complex anions with one type of ligand
- ◇ Naming complex ions
- ◇ Determining the oxidation state of the metal in a coordination compound
- ◇ Naming coordination compounds
- ◇ Determining the coordination number of a metal in a complex
- ◇ Understanding the connection between geometry and coordination number of a metal complex
- ◇ Distinguishing isomers and alternate views of a metal complex
- ◇ Drawing an isomer of a metal complex
- ◇ Drawing cis and trans isomers of a metal complex
- ◇ Adding electrons to a crystal field theory energy level diagram
- ◇ Predicting color and magnetic properties from a crystal field theory energy level diagram
- ◇ Drawing a crystal field theory energy level diagram
- ◆ Nuclear Chemistry (14 topics)
  - ◇ Interpreting the symbol for a nuclide
  - ◇ Writing the symbols in a nuclear chemical equation
  - ◇ Balancing a nuclear chemical equation
  - ◇ Writing the equation for a typical radioactive decay
  - ◇ Calculating the energy change in a nuclear reaction from the mass change
  - ◇ Knowing the properties of the common types of nuclear radiation
  - ◇ Understanding the common modes of radioactive decay
  - ◇ Understanding radioactive half life
  - ◇ Interconverting amount of radioactive decay and half life
  - ◇ Calculating radioactive activity from half life
  - ◇ Using isotope ratios to radiodate
  - ◇ Using activity to radiodate
  - ◇ Knowing units of radiation dosage and exposure
  - ◇ Identifying important types of nuclear medicine procedure
- ◆ Organic Chemistry and Biochemistry (157 topics)

- ◇ Identifying organic compounds
- ◇ Identifying rigid parts of an acyclic organic molecule
- ◇ Identifying hydrophobic and hydrophilic parts of an organic molecule
- ◇ Interpreting condensed chemical structures
- ◇ Interpreting condensed chemical structures with benzene rings
- ◇ Interpreting the skeletal structure of a neutral organic molecule
- ◇ Drawing a skeletal structure from a simple condensed structure
- ◇ Drawing a skeletal structure from a condensed structure
- ◇ Interpreting a skeletal structure with aromatic rings
- ◇ Recognizing different skeletal structures
- ◇ Understanding H atoms in a skeletal structure
- ◇ Comparing skeletal structures related by one fewer bond
- ◇ Using wedges and dashes in skeletal structures
- ◇ Naming normal alkanes
- ◇ Identifying the main chain of branched alkanes
- ◇ Naming the parent hydrocarbon of branched alkanes
- ◇ Naming alkyl side chains
- ◇ Identifying organic functional groups
- ◇ Using family suffixes to name organic compounds
- ◇ Understanding the basic descriptive vocabulary of hydrocarbons
- ◇ Understanding the basic descriptive vocabulary of molecules with functional groups
- ◇ Numbering the main chain of branched alkanes
- ◇ Naming and drawing small alkyl substituents
- ◇ Naming and drawing alkyl and alkoxy substituents
- ◇ Identifying constitutional isomers
- ◇ Drawing the condensed structure of a constitutional isomer
- ◇ Drawing the skeletal structure of a constitutional isomer
- ◇ Identifying a chiral molecule from its condensed structure
- ◇ Identifying chiral centers in a cyclic molecule
- ◇ Drawing the mirror image of a simple organic molecule
- ◇ Identifying the enantiomer of a simple organic molecule
- ◇ Classifying organic reactions
- ◇ Recognizing organic acids and bases
- ◇ Deducing oxidation state from a Lewis structure
- ◇ Identifying oxidation and reduction in organic reactions
- ◇ Naming branched alkanes
- ◇ Using multiplying affixes in the names of branched alkanes
- ◇ Naming and drawing normal alkanes.
- ◇ Naming and drawing simple cyclic alkanes
- ◇ Naming and drawing branched alkanes
- ◇ Naming and drawing simple substituted cycloalkanes
- ◇ Naming unbranched alkenes and alkynes
- ◇ Naming alkenes and alkynes
- ◇ Naming and drawing linear alkenes with one double bond
- ◇ Identifying cis/trans isomerism in a small condensed structure
- ◇ Identifying cis/trans isomerism in a skeletal structure
- ◇ Drawing the cis or trans isomer of a small alkene
- ◇ Naming benzene derivatives
- ◇ Predicting the reactants or products of alkene hydrogenation
- ◇ Predicting the reactants or products of alkene hydration
- ◇ Naming alkyl halides
- ◇ Naming and drawing alkyl halides
- ◇ Naming alcohols

- ◇ Naming and drawing alcohols without alkyl side groups
- ◇ Naming and drawing thiols without alkyl side groups
- ◇ Naming and drawing alcohols
- ◇ Identifying primary, secondary, and tertiary alcohols
- ◇ Identifying common alcohols from a description
- ◇ Predicting the products of symmetric alcohol dehydration
- ◇ Predicting the reactants or products of alcohol oxidation
- ◇ Understanding the common names of simple ethers
- ◇ Understanding the common names of simple ketones
- ◇ Naming and drawing ketones
- ◇ Naming and drawing aldehydes
- ◇ Predicting the reactants or products of alcohol and aldehyde oxidation
- ◇ Predicting the reactants or products of carbonyl reduction
- ◇ Identifying and drawing hemiacetals and acetals
- ◇ Predicting the reactants or products of hemiacetal and acetal formation
- ◇ Predicting the reactants or products of acetal hydrolysis
- ◇ Understanding the common names of simple amines
- ◇ Identifying primary, secondary, and tertiary amines
- ◇ Naming and drawing primary amines without alkyl side groups
- ◇ Naming and drawing secondary and tertiary amines
- ◇ Naming aldehydes and acids
- ◇ Naming and drawing carboxylic acids
- ◇ Understanding the names of carboxylate salts
- ◇ Naming and drawing unsubstituted esters
- ◇ Identifying primary, secondary, and tertiary amides
- ◇ Naming and drawing unsubstituted amides
- ◇ Understanding common names of carboxylic acids and derivatives
- ◇ Identifying positions labeled with Greek letters in acids and derivatives
- ◇ Knowing the common names of small diacids
- ◇ Predicting the reactants or products of esterification
- ◇ Predicting the reactants or products of ester hydrolysis
- ◇ Predicting the products of ester saponification
- ◇ Predicting the reactants or products of amidation
- ◇ Predicting the products of amide hydrolysis
- ◇ Understanding the descriptive vocabulary of monosaccharides
- ◇ Drawing the Fischer projection of the enantiomer of a monosaccharide
- ◇ Drawing the Haworth projection of an aldose from its Fischer projection
- ◇ Drawing the Haworth projection of a ketose from its Fischer projection
- ◇ Naming and drawing cyclic monosaccharides
- ◇ Identifying a given carbon in a cyclic monosaccharide
- ◇ Naming and drawing the products of aldose oxidation and reduction
- ◇ Identifying the parts of a disaccharide
- ◇ Knowing the names and properties of common sugars
- ◇ Identifying common polysaccharides
- ◇ Understanding the glycosidic links in common polysaccharides
- ◇ Understanding the basic descriptive vocabulary of fatty acids
- ◇ Understanding lipid number notation
- ◇ Understanding melting points trends of fatty acids
- ◇ Identifying the components of wax esters
- ◇ Identifying the parts of a triacylglycerol
- ◇ Identifying the parts of a glycerophospholipid
- ◇ Identifying the parts of a sphingomyelin
- ◇ Identifying molecules that could be in a cell membrane



- ◇ Recognizing the steroid nucleus
- ◇ Classifying lipids derived from fatty acids
- ◇ Matching structure and function of common lipids
- ◇ Predicting the products or reactants of triacylglycerol hydrogenation
- ◇ Predicting the products or reactants of triacylglycerol hydrolysis or saponification
- ◇ Recognizing alpha amino acids
- ◇ Classifying amino acids
- ◇ Identifying the stereochemistry of natural amino acids
- ◇ Understanding the general acid–base properties of amino acids
- ◇ Identifying and drawing peptide bonds
- ◇ Describing peptides with 3–letter codes
- ◇ Identifying specific interactions between residues in a protein
- ◇ Predicting the location in a protein of a residue sequence
- ◇ Naming an element of protein secondary structure from a description
- ◇ Identifying changes at different levels of protein structure
- ◇ Recognizing nucleotides
- ◇ Numbering the carbons in nucleotides
- ◇ Naming and drawing nucleosides
- ◇ Naming and drawing nucleotides
- ◇ Understanding the arrangement of hydrogen bonds in DNA base pairs
- ◇ Understanding the structure of nucleic acid strands
- ◇ Writing complementary DNA sequences
- ◇ Understanding that DNA replication is semiconservative
- ◇ Identifying the major types of RNA from a description
- ◇ Understanding the relationship between DNA and mRNA base sequences
- ◇ Using the genetic code
- ◇ Classifying mutations
- ◇ Predicting reactants or products of phosphorylation
- ◇ Predicting the products of phosphoester or phosphoanhydride hydrolysis
- ◇ Understanding major biochemical energy storage and release reactions
- ◇ Identifying common redox coenzymes by their roles in a reaction
- ◇ Understanding the formation and hydrolysis of acyl–CoA
- ◇ Knowing basic facts about enzymes
- ◇ Classifying enzymes
- ◇ Identifying reactants and products from an enzyme name
- ◇ Understanding basic models of competitive and noncompetitive inhibition
- ◇ Predicting the effect of temperature or pH on enzyme activity
- ◇ Understanding the biochemistry of digestion
- ◇ Knowing inputs and outputs of the citric acid cycle
- ◇ Understanding the general mechanism of oxidative phosphorylation
- ◇ Solving citric acid cycle ATP stoichiometry problems
- ◇ Knowing inputs and outputs of glycolysis
- ◇ Completing a simplified diagram of glycolysis
- ◇ Completing a simplified diagram of glucose catabolism
- ◇ Solving carbohydrate catabolic stoichiometry problems
- ◇ Knowing the steps of beta oxidation
- ◇ Predicting the product of beta oxidation activation
- ◇ Knowing inputs and outputs of beta oxidation
- ◇ Solving fatty acid catabolic stoichiometry problems
- ◇ Predicting the products of catabolic amino acid transamination
- ◇ Completing a diagram of protein catabolism

**\*Other Topics Available** *By default, these topics are NOT included in the course, but can be added using the content editor in the Teacher Module.*