DATE	TIME	WORKSHOP	TOPIC	TUTOR
Friday, January 29, 2021	2:00 PM	0	Mastering Chemistry	
Wednesday, February 3, 2021	2:00 PM	1	Significant Figures	
Wednesday, February 10, 2021	2:00 PM	2	Conversions and Dimensional Analysis	
Wednesday, February 17, 2021	2:00 PM	3	Algebra for Chemistry	
Wednesday, February 24, 2021	2:00 PM	4	Deconstructing an Atom	
Thursday, February 25, 2021	2:00 PM	EX1R	EXAM 1 REVIEW	
Friday, February 26, 2021	2:00 PM	EX1R	EXAM 1 REVIEW	
Wednesday, March 3, 2021	2:00 PM	5	Naming Inorganic Compounds	
Wednesday, March 10, 2021	2:00 PM	6	Balancing Chemical Equations	
Wednesday, March 17, 2021	2:00 PM	7	Combustion Analysis and the Empirical Formula	
Wednesday, March 24, 2021	2:00 PM	8	Limiting Recantants	
Thursday, March 25, 2021	2:00 PM	EX2R	EXAM 2 REVIEW	
Friday, March 26, 2021	2:00 PM	EX2R	EXAM 2 REVIEW	
Wednesday, March 31, 2021	2:00 PM	SB	SPRING BREAK/NO CLASS	
Wednesday, April 7, 2021	2:00 PM	9	Solutions and Titrations	
Wednesday, April 14, 2021	2:00 PM	10	Molec Equations, Ionic Equations, and Precip Reactions	
Wednesday, April 21, 2021	2:00 PM	11	Introduction to Redox	
Thursday, April 22, 2021	2:00 PM	EX3R	EXAM 3 REVIEW	
Friday, April 23, 2021	2:00 PM	EX3R	EXAM 3 REVIEW	
Tuesday, April 27, 2021	2:00 PM	EX3R	EXAM 3 REVIEW	
Wednesday, April 28, 2021	2:00 PM	TBD		
Wednesday, May 5, 2021	2:00 PM	12	Manipulating the Ideal Gas Law	
Wednesday, May 12, 2021	2:00 PM	13	Kinetic-Molecular Theory of Gases	
Thursday, May 13, 2021	2:00 PM	EX4R	EXAM 4 REVIEW	
Friday, May 14, 2021	2:00 PM	EX4R	EXAM 4 REVIEW	
Monday, May 17, 2021	2:00 PM	EX4R	EXAM 4 REVIEW	

WORKSHOPS WITH DESCRIPTIONS:

Che 101/102/103 Workshops:

Workshop 1: Significant Figures

This workshop will help you better understand the importance of significant figures, how to identify the number of significant figures a value has, and the uncertainty in a reported value. Students will practice identifying the correct number of significant figures a particular value has, converting these figures into scientific notation format, and reporting values to the correct number of significant figures after completing arithmetic calculations.

Workshop 2: Conversions and Dimensional Analysis

This workshop will focus on converting units from one form to another. A technique called dimensional analysis will be focused on which helps track the units as they move from one form to another. Students will be able to practice Metric unit conversions, Imperial unit conversions, and others such as time, and should be able to apply the methods practiced to their Chemistry work.

Workshop 3: Algebra for Chemistry

The focus of this workshop is to increase students' mastery of algebraic word problems. Working with a facilitator, attendees will look at chemistry practice problems to determine the equations within, and what the corresponding variables mean. They will then match the appropriate equation to the related problem and solve the problems with the information provided. This approach will be useful throughout your chemistry studies.

Workshop 4: Deconstructing an Atom

In this workshop we will discuss the components that make up an atom, specifically protons, neutrons, and electrons. We will also discuss what ions and isotopes are, and how they form. We will discuss isotope notation, and how we obtain information about the atom, ion, or isotope from the notation.

Workshop 5: Naming Inorganic Compounds

This workshop will focus on reviewing the concept of identifying molecular versus ionic compounds. The students will then go over the naming techniques for each type of compound, including acids. We'll go through practice examples using the nomenclature reference chart to assist at first, until the students are comfortable on their own.

Workshop 6: Balancing Chemical Equations

Balancing chemical equations is an incredibly important part of chemistry. The only way we can relate one substance to another is through a balanced chemical equation. In this workshop we will go over some methods for balancing equations and practice a variety of examples.

Workshop 7: Combustion Analysis and the Empirical Formula

Combustion analysis is a method used to determine the empirical formula of compounds by burning the sample under conditions where the resulting products can be quantitatively analyzed. We will go through the process for using this information to calculate the empirical formula. We will also review how the empirical formula is related to the empirical formula.

Workshop 8: Limiting Reactants

This workshop will focus on the process of identifying the limiting and excess reactants in a chemical reaction. We will also work through the steps for finding the reactions's theoretical yield, percent yield, and amount of excess reactant remaining.

Workshop 9: Solutions and Titrations

This workshop will provide an overview of some important solution chemistry terminology. We will present the relationship between molarity, moles, and volume to the students and try to demonstrate this relationship using examples we'll work through together. The students will also be provided with examples to try on their own.

Workshop 10: Molecular Equations, Ionic Equations, and Precipitation Reactions

This workshop will focus on the differences between the types of equations discussed throughout Chapter 4 of the textbook. The students and tutors will work through specific examples of each type of equation, eventually being able to write the molecular equation, ionic equation, and net ionic equations of the various reactions presented to them. The students will also practice determining which products are soluble and which are insoluble.

Workshop 11: Introduction to Redox

This workshop will review the overall concept of oxidation-reduction reactions, and focus on how to determine whether or not a reaction is redox. We will also practice assigning oxidation states and relate that process to redox determination.

Workshop 12: Manipulation the Ideal Gas Law

During this workshop we will discuss the the Ideal Gas Law, paying particular attention to the variables of the law, and the types of problems we can solve using the law.

Workshop 13: Kinetic-Molecular Theory of Gases

This workshop reviews the kinetic-molecular theory of gases and demonstrates how to use this theory to solve problems. The students will discuss some of the theory behind the kinetic equations, how and why the gas constant changes form, and then practice using this information in a variety of sample questions provided.

Workshop 14: Deciphering Thermochemistry Equations

This workshop will focus on understanding what each thermochemistry formula means, what units go with what formula, why the units are important, and how the students will use the equations to solve practical problems. There are a number of actual examples for the students to go through, and a sheet for the tutors containing common problems students have/errors they should look out for.

Workshop 15: Hess's Law

During this workshop we will practice how to use Hess's Law to calculate the ΔH value of overall reactions. By the end of the session students will feel comfortable manipulating the reactions and ΔH values in order to calculate the overall ΔH.

Workshop 16: Orbitals and Quantum Numbers

This workshop will involve a discussion that examines students' understanding of orbitals and quantum numbers which can be found in chapters 8 and 9 (Chemistry: A Molecular Approach, Tro, 5th Edition). Students will be able to explain the first three quantum numbers used to describe electron orbitals and the fourth quantum number to describe the spin of an electron.

Workshop 17: Electron Configurations of Neutral Atoms and Ions

This workshop will involve a lot of practice in writing the electron configurations of various neutral atoms and ions. We'll focus on the different strategies for approaching the electron configurations of cations versus anions. We will also use the electron configurations to write orbital diagrams and determine whether structures are diamagnetic or paramagnetic.

Workshop 18: Lewis Structures, Resonance, and Formal Charges

This workshop will focus on what the process is for writing a valid Lewis Structure. The students and tutors will discuss why each step in the process is important when determining the correct structure. Multiple practice examples will be provided, and once the students are comfortable writing valid structures, we will begin looking at formal charge. We will see how to use formal charge to find the most correct Lewis structure.

Workshop 19: Molecular Geometry and Hybridization

This workshop will focus on how we determine the geometry of a molecule based on its Lewis structure. We will also look at the definition of hybridization, and how the molecular geometry affects the hybridization of a molecule's interior atoms.

Workshop 20: Intermolecular Forces and Phase Diagrams

This workshop will focus on the different types of intermolecular forces. We will look at the interactions involved in each force, try to rank them logically in order of strength, and figure out what kinds of intermolecular forces are present in a variety of examples. We will also look at phase diagrams and spend a little time talking about what they mean and how we use them.

Che 104 Workshops:

Workshop 21: Expressing Solution Concentration

This workshop will focus on reviewing the various ways to concentration. We will go through each concentration unit's definition, and demo how to convert from one concentration to another. By the end of the session students should feel comfortable using the various units for concentration and converting between them.

Workshop 22: Using the Rate Summary Table

In this workshop we are going to spend time breaking down the Rate Law Summary Table. Specifically, we will look at the integrated rate laws, half-life expression, the straight-line plots of concentration and time, and the units of k as they relate to each order. We will practice with word problems to become comfortable with using the various equations in the correct situations.

Workshop 23: ICE ICE Baby

This workshop is intended to introduce students to an important tool in solving equilibrium reactions - ICE tables. We will go through what the ICE table is, how to use the information we are given in the problem to fill it out, and how to use the ICE table to solve equilibrium reaction questions.

Workshop 24: Q, K, and Le Chatelier

This workshop will focus on how reactions shift and why. We will look at the relationship between the reaction quotient (Q) and the equilibrium constant (K), and use that relationship to predict the direction the reaction will move. We will also look at Le Chatelier's Principle and see how different systems at equilibrium respond when their equilibrium is disturbed.

Workshop 25: Acids and Bases

This workshop will help students understand how to relate pH, $[H^+]$, pOH, and $[OH^-]$. The students will practice using just one of the values to find the other three. We will also look at the relationship between Ka, pKa, Kb, and pKb. We will then go over how each of these values relates to the strength of an acid or base.

Workshop 26: Titrations and Buffers

There will be two main foci of this workshop. The first will be on finding the pH and pH changes in buffer solutions. We will use the ICE table method and the Henderson-Hasselbalch Equation. We will then practice finding the pH at various points throughout a titration.

Workshop 27: ΔG°_{rxn}, ΔG, and K

We are going to use this session to first look at the relationship between ΔG° and ΔG_{rxn} using the reaction quotient, Q. Then we will figure out the relationship between free energy and the equilibrium constant. We will see that the relationship between free energy and K is logarithmic - small changes in free energy have a large effect on the equilibrium constant.

Workshop 28: Balancing Redox Reactions

We are going to review the rules for assigning oxidations states to compounds, then we will apply these rules to balancing full redox equations. We will go through the process of balancing these reactions step-by-step, in both acidic and basic solutions.

Workshop 29: The EKG Triangle

We are going to look at the relationship between cell potential, free energy, and the equilibrium constant, and how we can move back and forth between them. We will look at the way each of these are related to one another through the convenient triangle that is discussed in your textbook.

Workshop 30: Naming Coordination Compounds

We will focus on the process of naming coordination compounds, which can be overwhelming at first. We'll practice recognizing ligands, remembering the charges on the ligands that have them, and deciding whether they

are monodentate, bidentate, or polydentate. We will then go through the step-by-step process of naming complex cations and complex anions.

Workshop 31: Crystal Field Splitting

This workshop will cover the bonding model for transition metals. We will largely focus on the octahedral complexes, differentiating between high-spin and low-spin complexes, as well as strong-field and weak-field ligands. We will also use the diagrams to decide whether or not a complex is magnetic. We will finish the workshop by briefly discussing the bonding models of square planar and tetrahedral complexes, and how they differ from octahedral ones.