Unit 7 Equilibrium: Equilibrium

Textbook References: *Chemistry* Zumdahl 5th Edition Chapters 12 Kinetics:

1. describe the equilibrium state
2. use Le Chatelier to determine the direction of a reaction
3. write equilibrium expressions
4. use equilibrium expressions to calculate K or the equilibrium concentration of reactants and products
5. use K to determine the extent of a reaction
6. use the reaction quotient to determine the direction of a reaction
7. solve common ion problems
8. evaluate a reaction mechanism with an equilibrium step
9. covert between K_p and K_c

Vocabulary:
Equilibrium, Le Chatelier principle, reaction quotient, common ion

AP Course Guide correlation:
III. Reactions
D. Kinetics
1. Concept of rate of reaction
2. Use of experimental data and graphical analysis to determine reactant order, rate constants, and reaction rate laws
3. Effect of temperature change on rates
4. Energy of activation; the role of catalysts
5. The relationship between the rate-determining step and a mechanism
III. Reactions
C. Equilibrium
1. Concept of dynamic equilibrium, physical and chemical; Le Chatelier's principle; equilibrium constants
2. Quantitative treatment
a. Equilibrium constants for gaseous reactions: *Kp*, *Kc*

IB course Outline correlation:
7.1.1 Outline the characteristics of chemical and physical systems in a state of equilibrium.
7.2.1 Deduce the equilibrium constant expression (*K*c) from the equation for a homogeneous reaction.
7.2.2 Deduce the extent of a reaction from the magnitude of the equilibrium constant.
7.2.3 Apply Le Chatelier's principle to predict the qualitative effects of changes of temperature, pressure and concentration on the position of equilibrium and on the value of the equilibrium constant.
7.2.4 State and explain the effect of a catalyst on an equilibrium reaction.
7.2.5 Apply the concepts of kinetics and equilibrium to industrial processes.
17.2.1 Solve homogeneous equilibrium problems using the expression for *K*c.