Course Title **SMHS**

Chemistry A/B (P)

Description of Target Group

This course is designed for 10th, 11th, and 12th grade students who are university or technical prep and who are going to major in a science related field. Recommend passing grades in IPS or Biology Blue, Algebra 1, Geometry, and concurrent enrollment in Algebra 2.

Purpose

To provide the students information about the substances in the environment and how these substances interact.

Standards of Expected Student Achievement

The students will demonstrate their mastery of chemistry by solving problems using the following facts, theories, concepts, and techniques:

1. graphing
2. scientific notation
3. metric system
4. significant figures
5. gas pressure
6. Boyle's law
7. molecular model of gases
8. weights of equal volumes of gases
9. Avogadro's hypothesis
10. mole
11. atoms
12. chemical equations
13. molarmass
14. partial pressures
15. Charle'slaw
16. standard temperature and pressure
17. absolute temperature
18. Kinetic energy
19. kelvins
20. absolute zero
21. gas content
22. ideal gas law
23. element
24. compound
25. purity
26. decomposition of compounds
27. analysis

28. chemical synthesis
29. Law of Definite Proportions
30. symbols
31. structural formulas
32. reactants
33. products
34. chemical reactions
35. balancing equations
36. molecule relationships
37. mole relationships
38. volume relationships
39. mass relationships
40. combustion
41. hydrocarbons
42. carbohydrate
43. alkali metals
44. hydroxides
45. periodicity
46. periodic table
47. groups
48. noble gases
49. columns
50. rows
51. electric charge
52. like charge repulsion
53. opposite charge attraction
54. Coulomb's Law
55. neutral
56. protons
57. electrons
58. vacuum tube
59. field
60. cathode
61. charge of electron
62. mass of electron
63. Millikan's oil drop experiment
64. ions
65. mass spectrograph
66. isotopes
67. J.J. Thomson's atomic model
68. Rutherford's scattering experiment
69. Rutherford's atomic model
70. alpha particle
71. nucleus

72. atomic number

73. atomic size
74. angstrom
75. neutron
76. mass number
77. radioactivity
78. alpha particle
79. beta particle
80. gamma ray
81. nuclear fission
82. nuclear fusion
83. light as a wave
84. frequency
85. wavelength
86. diffraction pattern
87. interference pattern
88. spectrograph
89. refraction
90. hertz
91. infrared
92. ultraviolet
93. light as energy
94. Planck's constant
95. photon
96. photoelectric effect
97. atomic spectra
98. atomic spectra model
99. atomic energy levels
100. quantum mechanics
101. Bohr's model of the Hydrogen atom
102. wave properties of matter
103. DeBroglie's standing wave model
104. probability
105. principle quantum number
106. orbital
107. s orbital
108. p orbital
109. d orbital
110. f orbital
111. wave functions
112. electron configuration
113. ground state
114. Pauli's exclusion principle
115. dosed shell

116. energy level filling
117. periodic pattern of electron configurations

118. periodic pattern of chemical properties
119. ionization energy
120. alkaline earth metals
121. chemical bond
122. overlap of half-filled orbitals
123. covalent bond
124. representation of chemical bonding
125. orbital representation
126. dot representation
127. line representation
128. valance orbitals
129. valance electrons
130. bonding capacity
131. reactivity
132. stability
133. ionic bond
134. dipole
135. electron density maps
136. molecular structure
137. X-ray diffraction
138. bond angle
139. electron dot formula
140. electron pairs
141. electron-pair repulsion theory
142. tetrahedral electron pair arrangement
143. unshared electron pairs
144. shared or bonding electron pairs
145. hybrid orbitals
146. hybridization of orbitals
147. double bonds
148. triple bonds
149. bond energy
150. resonance
151. resonance hybrids
152. molecular formulas
153. dipole moment
154. isomers
155. structural isomers
156. geometric isomers
157. Identify activities such as observing, describing, classifying, testing, and predicting as important in science of chemistry.
158. Recognize formulas and develop proficiency in the balancing of equations.

159. Ability to use empirical and mathematical relationships to solve weight volume relationships (stoichiometry).

160. Accurately work through assigned experiments to arrive at a definitive and logical conclusion.

161. To describe and show how chemical bonding explains stability of chemicals in combined state.

162. Recognize and know implications of acid-base PH, oxidation-reduction states, ionization and equilibrium.

163. Be able, at all times, to use all metric and scientific notation.

164. Understand radioactive decay and be able to write nuclear equations.

165. Identify the organic compound structures of saturated and unsaturated hydrocarbons.

166. To accept responsibility for the safe and careful handling of all needed equipment and materials.

Instructional Materials

Text and Supplementary Materials

Refer to: Secondary Adopted Texts and Approves Supplementary Books Used in the Santa Maria Joint Union High School District

Activities

Experiments at assigned lab desks, three dimensional physical model construction, correlated chemistry study films, demonstrations, weekly quizzes and tests on point score basis.