



**SAMSEN WITTAYALAI SCHOOL  
ENGLISH PROGRAM**

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**COURSE OUTLINE**

Subject: Chemistry 3 (SC32221)	Course Classification: <input type="radio"/> Foundation <input type="checkbox"/> Additional
Learning Period: 2 Periods/Week	Credit Unit: 1
Grade Level: Mattayomsuksa 5 (Grade 11)	Semester 1, Academic Year 2022
Learning Area: Science and technology	Samsenwittayalai School English Program
Teacher: Dr.Pornpimol Prayongpan	

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**I. COURSE DESCRIPTION**

Study some physical properties and their reactions of elements that are in the same group or period and additional properties that influence the chemical behavior of the elements and their chemical compounds especially the representative elements, and transition metals. Define coordination compounds, essential elements and biological compounds. Study nuclear chemistry in the topics of radioactive elements, half-life, fusion and fission reactions, and applications of radioactive elements. Explain properties of gases, diffusion and effusion of gases, the kinetic molecular theory of gases, properties of solids, and technological applications of states of matter. Define rate of a chemical reaction, proceeding of chemical reaction and its energy change, factors affecting rate of a chemical reaction.

By using the scientific processes, seeking knowledge, searching data, investigating, analyzing, comparing, explaining, discussing and conclude.

For improving the scientific knowledge and understanding so that the students can make use of the knowledge to make decision, develop scientific skill including the 21<sup>st</sup> century skills in information technology, critical thinking and problem-solving and communicating. They can also communicate the knowledge and can use the knowledge in every day's life, leading to scientific mind, ethics, virtues and appropriate attitudes.

**II. INDICATORS/LEARNING OUTCOMES**

1. Learners' reading, analytical thinking and writing skills meet the criteria prescribed by the respective educational institutions.

2. Learners' desirable characteristics meet the criteria prescribed by the respective educational institutions.
3. Describe some physical and chemical properties and their reactions of elements that are in the same group or period of the elements on the periodic table.
4. Define coordination compounds, essential elements and biological compounds.
5. Study nuclear chemistry in the topics of radioactive elements, half-life, fusion and fission reactions, and applications of radioactive elements.
6. Identify the mathematical relationships between the various properties of gasses.
7. Use the combined gas equation, ideal gas law, and related gas laws, to compute the values of various gas properties under specified conditions.
8. State Dalton's law of partial pressures and use it in calculations involving gaseous mixtures.
9. Define and explain effusion and diffusion.
10. State Graham's law and use it to compute relevant gas properties.
11. Explain and develop a model of gasses, and technological applications of gasses.
12. Study the properties of solids, and technological applications of states of matter.
13. Define chemical reaction rate.
14. Derive rate expressions from the balanced equation for a given chemical reaction.
15. Calculate reaction rates from experimental data.
16. Explain the form and function of a rate law and use rate laws to calculate reaction rates.
17. Explain collision and transition-state theories.
18. Define the proceeding of chemical reaction and its energy change.
19. Describe the effects of chemical nature, physical state, temperature, concentration, and catalysis on reaction rates.

### III. TENTATIVE COURSE OUTLINE

Week	Topics / Contents	Indicators	Period(s)
1.	Predict the position and properties of the elements in the periodic table.	3	2
2.	Properties of the representative elements along the period and row	3	2
3.	Properties of transition elements	4	2
4.	Coordination compounds	4	2
5.	Radioactive elements, Nuclear reaction and its half-life	5	2
6.	Uses of isotopes and biological effects of radiation	5	2
7.	Properties of gases	6	2
8.	Boyle's law, Charles's law, Avogadro's law and the ideal gas law	7	2

9.	<b>Mid-term Examination</b>		
10.	Applications of the ideal gas law	7	2
11.	Dalton's law of partial pressures	8	2
12.	Effusion and diffusion, Graham's law	9, 10, 11	2
13.	Properties of solids and phase changes	12	2
14.	Technological applications of states of matter	12	2
15.	The rate of a chemical reaction	13, 14	2
16.	Average rate, Instantaneous, and initial reaction rate	15	2
17.	The rate law and its components	16	2
18.	The proceeding of chemical reaction and its energy change.	17, 18	2
19.	The factors affecting rate of a chemical reaction.	19	2
20.	<b>Final Examination</b>		

#### IV. TEACHING METHODS AND MANAGEMENT

- Individual work                       Lecture/Discussion                       Group work  
 Self-learning

#### V. TEACHING MATERIALS/SUPPLEMENTS

- Handouts                                       Worksheets                                       Exercises  
 Commercial Textbook

1. Chemistry: The molecular nature of matter and change 7<sup>th</sup> edition. by Silberberg & Amateis.
2. Chemistry 10<sup>th</sup> edition. by Raymond Chang.

#### VI. ASSIGNMENT AND EVALUATION

Indicator / Learning Outcome Score from SGS	Formative I	Midterm	Formative II			Final
	1		10	11	12	
<b>Total score</b>	<b>15</b>	<b>15</b>	<b>10</b>	<b>10</b>	<b>20</b>	<b>30</b>
1. Learners' reading, analytical thinking			10			

2. Learners' desirable characteristics				10		
3. Indicator/ Learning Outcome no. 3-7	15	15				
4. Indicator/ Learning Outcome no. 7-19					20	30
<b>TOTAL</b>	15	15		40		30

## VII. ASSIGNMENT

SGS No.	Score (points)	Assignment	Deadline	Type			Remark
				Test	Individual	Group	
3.	5	Quiz/worksheet	June		✓		
4.	5	Quiz/worksheet	June		✓		
5.	5	project	Before the Midterm Exam.			✓	
6. – 12	10	Quiz/worksheet	July		✓		
13. – 19.	10	Quiz/worksheet	August-September		✓		

**Note: 1. Assignments are quiz, homework, exercise report or project etc.  
2. The details in assessment and evaluation are tentative.**