

Syllabus [2025Year 2 Term]

Course Information

Course Title	General Chemistry 2	Credits	3
Course Code	559390-1	Required/Elective (For Undergraduate Courses)	basic Major
Department or Major	Department of Bio and Material Engineering	Language	English
Methods of Teaching		Lecture Room	월9,10,11,12,13,14(국제505)
Time Allotment	Lecture(3) Experiments(0) Trainging & Practice(0) Performance(0) Designing & Planning(0)	Cyber Lectures	
Course Type	offline		
Cyber Lectures Preview			

Lecturer

Lecturer	Name	Lee Sanghun	Rank	Professor	Final Academic Degree	한의학박사
	Department & college	Medical Consilience Engineering		Office	International Hall 413	
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	Field of Interest					

Course Summary

Course Description	General Chemistry is an introductory course designed to help students understand the fundamental concepts and principles of chemistry, enabling them to explain natural phenomena and solve scientific problems. The course covers key topics such as the structure of matter, chemical reactions, thermodynamics, and gas laws. Through lectures and problem-solving sessions, students will gain a solid foundation in chemistry and explore its applications in various fields of science and engineering.
Description Related Courses	Prerequisite Courses: None (The course is designed for beginners with no prior knowledge of chemistry.) Follow-Up Courses: Organic Chemistry: Advanced study of molecular structures and reaction mechanisms. Analytical Chemistry: Techniques for quantitative chemical analysis and experimental skill

	<p>s.</p> <p>Physical Chemistry: In-depth exploration of reaction kinetics, thermodynamics, and quantum chemistry.</p> <p>Materials Science and Engineering: Application of chemical properties in material development and engineering.</p>
Course Goals	<p>This course aims to develop the following competencies in students:</p> <p>Fundamental Academic Skills: Understand the basic concepts and theories of chemistry and explain them using mathematical and scientific reasoning. Develop analytical thinking and problem-solving skills to address various chemical problems.</p> <p>Scientific Inquiry Skills: Explain natural phenomena based on the structure and properties of matter. Analyze experimental data and derive chemical principles from the results.</p> <p>Interdisciplinary Thinking: Understand how chemistry connects with biology, physics, earth sciences, and engineering. Apply chemical knowledge to solve problems in other academic disciplines and real-world scenarios.</p> <p>Communication Skills: Clearly and logically explain chemical concepts. Enhance teamwork and communication skills through collaborative learning and presentations.</p> <p>Practical Problem-Solving Skills: Understand real-world chemical issues and apply methodologies to address them. Explore chemical perspectives on major societal challenges, such as environmental sustainability, energy, and health.</p>
Projected Results	<p>Understand the fundamental concepts and principles of chemistry and apply them to problem-solving.</p> <p>Acquire foundational knowledge of the structure, properties, and reactions of matter.</p> <p>Develop the ability to comprehend and explain chemical phenomena in everyday life based on chemical reasoning.</p> <p>Enhance scientific thinking and problem-solving skills through experiments and practice with problem-solving exercises.</p>
Percentage of the original language classes(%)	
Cyber Lectures P review	

Syllabus

Times	Lecture Topic	Lecture Goals	Lecture Methods	Assignments
1	Thermochemistry	Energy Basics Calorimetry Enthalpy Strengths of Ionic and Covalent Bonds	강의,	

Times	Lecture Topic	Lecture Goals	Lecture Methods	Assignments
2	Liquids and Solids	Intermolecular Forces Properties of Liquids Phase Transitions Phase Diagrams The Solid State of Matter Lattice Structures in Crystalline Solids	강의,	
3	Solutions and Colloids	The Dissolution Process Electrolytes Solubility Colligative Properties Colloids	강의,	
4	Thermodynamics	Spontaneity Entropy The Second and Third Laws of Thermodynamics Free Energy	강의,	
5	Fundamental Equilibrium Concepts	Chemical Equilibria Equilibrium Constants Shifting Equilibria: Le Châtelier's Principle Equilibrium Calculations	강의,	
6	Acid-Base Equilibria	Brønsted-Lowry Acids and Bases pH and pOH Relative Strengths of Acids and Bases Hydrolysis of Salts Polyprotic Acids Buffers Acid-Base Titrations	강의,	
7	Equilibria of Other Reaction Classes	Precipitation and Dissolution Lewis Acids and Bases Coupled Equilibria	강의,	
8	Midterm Exam	Review of Weeks 1-7		
9	Electrochemistry	Review of Redox Chemistry Galvanic Cells Electrode and Cell	강의,	

Times	Lecture Topic	Lecture Goals	Lecture Methods	Assignments
		Potentials Potential, Free Energy, and Equilibrium Batteries and Fuel Cells Corrosion Electrolysis		
10	Kinetics	Chemical Reaction Rates Factors Affecting Reaction Rates Rate Laws Integrated Rate Laws Collision Theory Reaction Mechanisms Catalysis	강의,	
11	Representative Metals, Metalloids, and Nonmetals	Periodicity Occurrence and Preparation of the Representative Metals	강의,	
12	Transition Metals and Coordination Chemistry	Occurrence, Preparation, and Properties of Transition Metals and Their Compounds	강의,	
13	Nuclear Chemistry	Nuclear Structure and Stability Nuclear Equations Radioactive Decay Transmutation and Nuclear Energy Uses of Radioisotopes Biological Effects of Radiation	강의,	
14	Organic Chemistry	Hydrocarbons Alcohols and Ethers Aldehydes, Ketones, Carboxylic Acids, and Esters Amines and Amides	강의,	
15	Semester Review	Comprehensive review of key concepts		

Methods of Grading

sequence	Description	Percentage	Details
1	Mid-tem Exam	30%	
2	Final-exam	30%	
3	Pop Quizzes	0%	
4	Assignments	20%	
5	Reports	0%	
6	Presentations & Discussions	0%	
7	Attendance	20%	
8		0%	
9	Others	0%	
All		100%	

Core of Value

핵심가치	전공역량	역량정의	역량구분	값(%)
혁신 (Discovery)	창의적문제해결 (Creative problem-solving)	주어진 상황과 문제를 창의적으로 해결할 수 있는 능력		0%
혁신 (Discovery)	도전 (Challenging)	전공 지식을 새로운 분야와 융합하고 아우를 수 있는 능력		0%
혁신 (Discovery)	지식융합 (Knowledge convergence)	새로운 분야를 개척하거나 도전적으로 임할 수 있는 능력		0%
헌신 (Dedication)	세계시민 (Universal value)	세계 공동체 구성원으로 전공자로서 국제적 이슈에 대응할 수 있는 능력		0%
헌신 (Dedication)	상호협력 (Cooperation)	공동의 목적 달성을 위해 타인과 상호협력을 할 수 있는 능력		0%
헌신 (Dedication)	공동체 (Sense of community)	공동체의 구성원으로서 필요한 태도와 윤리의식을 가질 수 있는 능력		0%
능동 (self-Determination)	자기주도 (Self-Managing)	주어진 상황과 문제를 주도적이고 능동적으로 해결할 수 있는 능력	주역량	0%
능동 (self-Determination)	지식활용 (Knowledge application)	주어진 상황과 문제에 대해 논리적으로 파악하고 분석할 수 있는 능력		0%

핵심가치	전공역량	역량정의	역량구분	값(%)
능동 (self-Determination)	논리적사고 (Logical thinking)	전공관련 지식을 필요에 따라 다양하게 적용하고 활용할 수 있는 능력	부역량	0%
능동 (self-Determination)	의사소통 (Articulation)	대화를 통해 다양한 의견을 조율하고 합의를 이끌어 낼 수 있는 능력	부역량	0%

Textbook(s) & References

Description	Title	Author	Publisher
References	Chemistry: The Central Science	Theodore Brown	Pearson Education Limited
References	General Chemistry	Raymond Chang	McGraw-Hill

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