

Department of Applied Chemistry

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What is Applied Chemistry?

Chemistry is the study of matter and the changes it undergoes. This includes understanding the composition of materials, the properties they exhibit, and the transformations that occur when they interact with other substances. Applied Chemistry is the systematic study of virtually everything that occupies space and has mass. Our entire planet is composed of chemicals, as are all other planets and stars in the universe. All living organisms on Earth are made of chemicals, and chemical reactions sustain every aspect of life—from basic biological processes to complex thoughts and behaviors. All materials and machines we create utilize the chemicals available on Earth, often transformed through chemical reactions into advanced materials tailored to meet our specific needs. The study of applied chemistry encompasses everything from the sun and stars to the Earth, the oceans, all forms of life, and all manufactured devices. To fully comprehend these phenomena, one must possess knowledge of chemistry—an interdisciplinary field that bridges biology, physics, geology, chemical engineering, medicine, and materials science.

Applied Chemistry at Kyung Hee University

The Applied Chemistry program focuses on education and research in chemistry and its practical applications. Our mission is to provide a comprehensive and enriching learning experience for students across diverse research groups specializing in analytical, biological, inorganic, organic, physical, and polymer chemistry. Additionally, we equip students with advanced tools and methodologies to tackle increasingly complex research challenges in emerging fields such as nanotechnology, biotechnology, environmental technology, and information technology. Through these efforts, our program maintains excellence in both education and research within the field of applied chemistry. Our research areas include medicinal chemistry, natural product chemistry, computational chemistry, organometallic chemistry, and physical organic chemistry. We also focus on chemical physics (both experimental and theoretical dynamics), materials science for organic-inorganic hybrid materials, organic and inorganic display materials, and synthesis and reactions in supercritical fluids. Currently, 14 faculty members actively participate in both undergraduate and graduate programs, directing various cutting-edge research projects.

| Degree Requirements |

- Minimum 130 credit hours of undergraduate-level coursework, including 67 credit hours of intensive Applied Chemistry courses, are required for the B.S. degree
- Students must fulfill presentation, defense, and documentation requirements for the Chemistry thesis committee
- A thesis advisor may be any faculty member from the Applied Chemistry department

| Courses |

Year 2

Introduction to Analytical Chemistry, Applied Analytical Chemistry, Analytical Chemistry Laboratory, Introduction to Physical Chemistry, Physical Chemistry I, Physical Chemistry II, Physical Chemistry Laboratory, Introduction to Organic Chemistry, Organic Chemistry I, Organic Chemistry Laboratory, Introduction to Inorganic Chemistry, Introduction to Applied Chemistry

Year 3

Reaction Kinetics, Organic Spectrometric Analysis, Organic Chemistry II, Advanced Material Science Laboratory, Computational Chemistry and Practice, Physical Organic Chemistry, Instrumental Analysis, Biochemistry I, Biochemistry II, Inorganic Chemistry I, Inorganic Chemistry II, Applied Electrochemistry

Year 4

Biochemistry Laboratory, Synthetic Organic Chemistry, Inorganic Materials Science and Technology, Applied Polymer Chemistry, Physical. Polymer Chemistry Research, Organic. Biochemistry Research, Catalyst Chemistry, Nanochemistry, Special Topics in Analytical Chemistry, Physical Chemistry for Nano-Biomaterials, Applied Molecular Chemistry, Analytical and Inorganic Chemistry Research

| Careers and Graduate Destinations |

Our graduates enjoy diverse employment opportunities across multiple sectors. They can pursue research and development careers in national laboratories, corporate research facilities, and various industries spanning classical chemistry as well as interdisciplinary fields such as

- Nanotechnology(NT)
- Biotechnology(BT)
- Information Technology(IT)
- Environmental Technology(ET)

| Faculty |

- ___ Yong Ho Kim, Ph.D. University of Minnesota, 1991, Professor, Physical and Computational Chemistry, yhkim@khu.ac.kr
- ___ Young Sik Lee, Ph.D. Columbia University, 1992, Professor, Physical Chemistry, yongslee@khu.ac.kr
- ___ Hak Won Kim, Ph.D. Iowa State University, 1992, Professor, Organic Chemistry, hwkim@khu.ac.kr
- ___ Sung Ik Yang, Ph.D. Seoul National University, 1998, Professor, Analytical Chemistry, siyang@khu.ac.kr
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- ___ Min Hyung Lee, Ph.D. Northwestern University, 2010, Professor, Material Chemistry, minhlee@khu.ac.kr
- ___ Eun Jeong Yoo, Ph.D. KAIST, 2009, Professor, Organic Chemistry, ejyoo@khu.ac.kr
- ___ Kyungtae Kang, Ph.D. KAIST, 2013, Associate Professor, Organic Chemistry, kkang@khu.ac.kr
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- ___ Tae Wu, Kim, Ph.D. KAIST, 2016, Assistant Professor, Physical Chemistry, kimtw@khu.ac.kr
- ___ Jinhyun Kim, Ph.D. Seoul National University, 2019, Assistant Professor, Hybrid Material, kim767@khu.ac.kr
- ___ Seung Ah Lee, Ph.D. Chonbuk National University, 2010, Assistant Professor, Bioanalytical Chemistry, moon1131@gmail.com