



IPB University  
— Bogor Indonesia —

Department of Chemistry  
Faculty of Mathematics and Natural  
Sciences

# ACADEMIC PROGRAM BOOK

## Chemistry Undergraduate Program



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global.ipb.ac.id



Bogor, Indonesia

# LEARNING OUTCOME

## KNOWLEDGE

- To be able to link the structure and the universe systematically through observation and experimentation that utilize science and technology as basic science applications including mathematics, physics, chemistry, and biology.
- To be able to describe the theoretical concepts of structure, properties, and changes in kinetics and thermodynamics, identification, separation, characterization, transformation, synthesis of materials, and their applications.
- To be able to use material knowledge and develop management systems that have been implemented in the industry widely, including ISO, HACCP, Works Health and Safety (K3), Halal Assurance Systems (HAS).

## SPECIFIC SKILLS

- To be able to organize standard operations of functions and know how to operate chemical instruments, as well as analyze data and information to produce the right conclusions.
- To be able to use software for analysis, synthesis, and molecular modeling in chemistry.
- To be able to demonstrate good practical work in the laboratory to support theoretical aspects by paying attention to work and environmental health and safety.
- To be able to solve the problems of science and technology in chemistry, including identification, analysis, isolation, transformation, and synthesis of simple materials through the application of knowledge of structure, properties, molecular changes, kinetics and thermodynamics.



# LEARNING OUTCOME

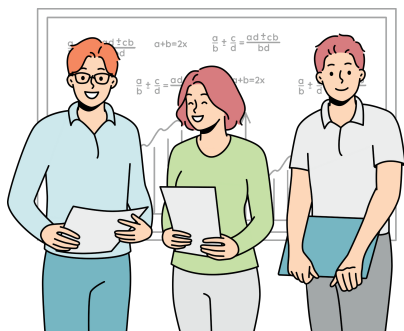
## GENERAL ATTITUDES AND SKILLS

- To be able to show piety to God Almighty; uphold human values; contribute to improve the quality of social life; proud and love the motherland; value diversity; able to work together; obey the law and discipline; internalize values, norms and ethics; be responsible; and internalize the spirit of independence, fighting, and entrepreneurship.
- To be able to communicate orally and in scientific writing; interpret, process, and present data; demonstrate skills in numeracy and mathematical thinking; demonstrate skills in problem solving; demonstrate an attitude of ethical responsibility; conduct good information sourcing, team working, and time management; and demonstrate soft skills such as organizational skills, creativity, and leadership.



# PROFILE

## SNAPSHOTS



**453**  
students

**80%**  
hold doctoral  
degree

**20%**  
masters  
degree

**20%**  
professors

**31**  
lecturers



## ACCREDITATION



Accredited by LAMSAMA and The Royal Society of Chemistry

# PROFILE

## A Brief History

The Department of Chemistry of FMIPA IPB manages the Undergraduate Program, the Master Program, and the Doctoral Program in Chemistry. The Undergraduate Program was established in 1988 and received International Accreditation from the Royal Society of Chemistry (RSC). It was also accredited by the Board of National Accreditation for Higher Education (BAN-PT) from 2003 to 2023 and by the Indonesian Accreditation Agency for Higher Education in Natural and Formal Sciences (LAMSAMA) from 2023 to 2028, achieving Superior status. As evidence of its international standard quality management system, the department has implemented ISO 9001: 2015. The department is also supported by 31 experienced lecturers, 80% of whom hold doctoral degrees, including 7 professors, and the rest 20% hold master's degrees. In addition, academic activities are supported by 23 staff.

The scope of work based on mastered knowledge includes mastering a set of chemical knowledge concerning the basics of chemistry (analytical, inorganic, organic, physical, and biological chemistry). Graduates can (1) work as scientists in government or industries, teach at schools, become entrepreneurs, or pursue other careers; or (2) continue their studies at a higher level in either professional programs or postgraduate programs. Managerial Ability includes (1) being able to self-evaluate and manage self-learning, and (2) being able to be responsible for working independently and working together in a team.

Starting from the academic year 2024/2025, The International Program of Chemistry Program will be opened and can be enrolled by foreign and Indonesian students. The course material is designed based on the potential of chemistry in studying and developing new materials and natural products as flagship objects, considering the latest development trends in chemistry in developed countries. This book provides prospective students with information regarding the international program related to the academic atmosphere/curriculum, regulations, and ethics, as well as other information related to the university itself.

# CURRICULUM

## Program Structure

### Program Scheme

**Scheme 1**

Customized

**Scheme 2**

3.5 years at IPB University  
0.5 at partner University

**Scheme 3**

4 years at IPB University



# CURRICULUM

## Course Mapping

### Common Core Courses

Courses	Credit	Semester
Religious Education*	3(2-1)	1
Pancasila Education*	1(1-0)	1
Civics Education*	1(1-0)	1
Indonesian	2(1-1)	1
Physics of Science and Technology	3(2-1)	1
Chemistry of Science and Technology	3(2-1)	1
Innovative Agriculture	2(2-0)	1
Mathematics and Logical Thinking	3(2-1)	1
English	2(1-1)	2
Basic Biology	3(2-1)	2
Economics	2(2-0)	2
Sociology	2(2-0)	2
Statistic and Data Analysis	3(3-0)	2
Computational Thinking	2(2-0)	2
Healthy Lifestyle**	1	during 1st year

### Foundational Literacies & Academic Core Courses

Courses	Credit	Semester
General Chemistry	3(2-1)	2
Inorganic Chemistry: Elements and Bonds	3(3-0)	3
Organic Chemistry I	3(3-0)	3
Practicum of Organic Chemistry	2(0-2)	3
Fundamental of Analytical Chemistry	3(2-1)	3
Practicum of Analytical Chemistry	2(0-2)	3
Chemical Thermodynamics	2(2-0)	3
Mathematical Chemistry	3(2-1)	3
Inorganic Chemistry: Solids and Coordination Compounds	3(3-0)	4
Practicum of Inorganic Chemistry	2(0-2)	4
Organic Chemistry II	3(3-0)	4
Chemistry of Separation and Electroanalytical	3(3-0)	4
Chemical Equilibrium	2(2-0)	4
Practicum of Physical Chemistry	2(0-2)	4
Enrichment Course	5	
Chemical Kinetics	2(2-0)	
Metabolism	3(3-0)	6

# CURRICULUM

## Course Mapping

### In-depth Study Program Courses

Courses	Credit	Semester
Quality Standardization System	1(1-0) +LH	3
Practicum of Integrated 1	2(0-2)	5
Inorganic Chemistry: Organometallics and Bioinorganic Spectrometry	3(3-0)	5
Structure and Function of Life Constituent Molecules	3(3-0)	5
Physical Organic Chemistry	2(2-0)	5
Chemometrics	3(2-1)	6
Scientific Writing Techniques	2(2-0) +LH	6
Synthesis of Organic and Inorganic Matter	3(3-0)	6
Determination of Molecular Structure	2(2-0)	6
Quantum Chemistry and Spectroscopy	3(2-1)	6
Integrated Practicum 2	2(0-2)	6
Computational Chemistry	LH	7

### Final Year Project, Capstones, KKNT, Internship

Courses	Credit	Semester
Chemical Innovation in Industry and Environment	4(1-3)	7
Chemical Innovation in Agriculture, Marine, and Tropical Biosciences	3(1-2)	7
KKN-Thematic	4(1-3)	7,8
Colloquium	1(1-0)	7
Field Work Practice/Internship	3(0-3)	7
Seminar	1(1-0)	8
Final Project (Thesis/Non-Thesis)	6(0-6)	8
Enrichment Courses	21	1,2,3,4, 5,6,7,8

#### \*\*\*) Information:

Enrichment Course 1-8: Courses from outside the Study Program within the Faculty/Courses from outside the Study Program outside the Faculty or outside university/Student Exchange/Student Creativity Program/National or International Competitions/Teaching Assistance in Education Units



# FACILITIES



**Organic Chemistry Laboratory**



**Inorganic Chemistry Laboratory**



**Analytical Chemistry Laboratory**



**Physical Chemistry Laboratory**



**Instrument Laboratory**



**Biopharmaca Laboratory**



**Integrated Laboratory**



**Student Mobility**



**International Collaboration**



**Guest Lecture**

# INTERNATIONAL COLLABORATION

## List of International Collaboration

Country/Region		Affiliated Partners
Universities	Malaysia	Universiti Putra Malaysia Universiti Teknologi Malaysia International Islamic University Malaysia University Sains Malaysia
	Netherland	Universiteit Leiden
	Singapore	National University of Singapore Nanyang Technological University
	Japan	Kyoto University Osaka University Nagoya University Gifu University Ehime University Shinshu University
	United Kingdom	Bath University
	Taiwan	National Chiayi University
	Research Institute	NAIST



# CONTACT

## The Faculty Campus

The Campus of the Department of Chemistry is located in Bogor City. The closest train station is Bogor Station. With easy access to neighboring cities, the campus is just 60 minutes from Jakarta on a Commuter Line, making it convenient for students to commute from out of town. The rich natural surroundings provide students with an ideal environment to study.

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