



# ***STUDENT HANDBOOK***



**BACHELOR OF SCIENCE IN CHEMISTRY  
UNIVERSITAS NEGERI YOGYAKARTA**

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## **PREFACE**

All praises belongs to Allah SWT for the overflow of mercy so the Students Handbook of Bachelor of Science in Chemistry (BSC), Faculty of Mathematics and Natural Sciences (FMIPA), Universitas Negeri Yogyakarta (UNY) are well organized. The BDSPC students handbook is organized and intended as a guide for students and lecturers in chemistry and all the academic civitas in the UNY environment even for prospective students who want to continue their higher education in chemistry field. This Student Handbook contains a brief history of BDSPC, BDSPC's vision-mission, curriculum, support and assistance, and staff. Through this Student Handbook, hoped it can be used as reference material, guide, and also depict the process for the lecturing activities occurred.

Yogyakarta, Juli 2019  
Bachelor of Science in Chemistry Team

**A. A Short History of Bachelor of Science in Chemistry**

The Bachelor of Science in Chemistry is one of the study programs under the Department of Chemistry Education at the FMIPA Yogyakarta State University. The Department of Chemistry Education was initially a B-1 Chemistry course which was opened on October 22, 1956. In 1961, the B-1 chemistry course was changed to the Department of Chemistry FKIP / B Gadjah Mada University. With the establishment of Yogyakarta State Teachers' Training College on May 21, 1964, the Department of Chemistry FKIP / B UGM joined the Teachers' Training College of Yogyakarta under the Faculty of Teacher Training of Exact Sciences (FKIE) under the name of the Department of Chemistry. Since 1980, FKIE has changed to FPMIPA (Faculty of Mathematics and Natural Sciences), and the Department of Chemistry has changed to the Department of Chemistry Education (Jurdik Chemistry) which manages Bachelor and D3 Chemistry Education Study Programs. In 1997, Jurdik Kimia was given an expanded mandate to open a S1 Chemistry Study Program. With the change of status of Yogyakarta State Teachers' Training College to Yogyakarta State University (UNY) in 1999, FPMIPA became FMIPA, and Jurdik Chemistry managed the S1 Chemistry Education Study Program and the S1 Chemistry Study Program. Thus, for more than 50 years, this study program has a role in improving the quality of chemical education in Indonesia.

**B. Vision of Bachelor of Science in Chemistry**

In 2025 a Study Program was created that produced chemistry graduates with academic, professional, innovative, creative and highly competitive capabilities in the field of chemistry at the Southeast Asian level based on devotion, independence and scholarship.

**C. Mission of Bachelor of Science in Chemistry**

The mission of the FMIPA UNY Chemistry Study Program is to carry out the Tri Dharma of Higher Education and other relevant activities including:

1. Education and teaching that can produce graduates who are virtuous, have professional academic abilities in the field of chemistry, excel, independent and are highly competitive in life and global civilization.
2. Chemical research that supports the development of chemistry and technology that is beneficial for improving human life and national development.
3. Community service through efforts to disseminate and apply research results in the development of fiber chemistry to participate in realizing a scientific, semocratic, independent society to support national development.
4. Collaborating with institutions, institutions at home and abroad to support the implementation of teaching, research and chemical development activities.
5. Fostering the academics to become members of the campus community who have piety, independence, scholars, and have a love of the nation and the country and the motherland.

**D. Objective**

The purpose of organizing the Bachelor of Science in Chemistry of FMIPA UNY is to produce a Bachelor of Chemistry who has the following competencies:

1. Having an attitude of piety, virtuous character, personality, independent, responsible, and have a strong nationalism spirit.
2. Having skills and creativity in chemistry so as to have a competitive advantage at the Southeast Asian level.

3. Mastering the sciences needed to develop his expertise in the field of chemistry so that he has competence in the field of chemistry, and certain chemical specialties.
4. Implement chemical science to support creative behavior in productive business endeavors.
5. Applying chemistry in social life nationally and globally in accordance with his profession in the field of chemistry.

### E. Occupational Profile

The occupational profile of the Bachelor of Science in Chemistry produces a superior, creative, and innovative Bachelor on Chemistry based on piety, independence and scholarship that is capable of being an independent research or analyst in the field of chemistry, teacher or trainer in the field of chemistry, and also entrepreneur or practitioner. Detailed descriptions of each occupational profile can be seen in Table 1.

Table 1. Occupational Profile of Bachelor of Science in Chemistry

No	Professional Field	Specifications for the Professional Field
1	Research assistant or analyst in chemistry	Bachelor of Science in Chemistry graduates can become research assistants or analysts in the field of chemistry who are professionals in various industries or research institutions, for example as quality control, industrial laboratories, operators of chemical analysis tools.
2	Educator or trainer in chemistry	Bachelor of Science in Chemistry graduates can become educators in the field of chemistry, such as lecturers, teachers, tutors, and companions of professional chemistry learners. In addition, graduates of this study program can also become competent trainers in the field of chemistry.
3	Entrepreneur or practitioner	Bachelor of Science in Chemistry graduates can become entrepreneurs or practitioners through the manufacture of products that involve the processes and applications of chemistry which can then compete in the global market and create new jobs.

### F. Programme Learning Outcomes

The PLO formulation refers to learning outcomes in BSC that have previously been agreed and established together with all chemistry departments in Indonesian universities that covers the domain of attitudes, knowledge, general skills, and special skills. The learning outcomes formula has been adjusted to the Indonesian President's Regulation (PPRI) No. 8/2012 concerning KKN (Indonesian National Curriculum Framework), Permenristekdikti (Regulation of Minister of Research, Technology and Higher Education) No. 44 of 2015 concerning SNPT (National Standards for Higher Education). Therefore, BSC UNY aims to produce scholars in the field of chemistry with competencies in attitudes, knowledge, generic skills, and specific skills that are superior, creative, and innovative based on piety, independence, and scholarship. The PLO formulation is then used as the basis for determining the learning outcome of each course that plays a role in achieving the expected occupational profile. The PLO formulation of BSC UNY can be seen in Table 2.



Table 2. Programme Learning Outcomes

Domain	PLO Formulation
Attitude	1. Have a religious attitude and human values
Generic Skills	2. Have an independent attitude, able to adapt and be responsible for completing tasks
	3. Communicate ideas or ideas verbally or in writing
Knowledge	4. Applying ICT effectively in the scientific field
	5. Using various chemical research strategies and techniques to solve chemical problems and research
	6. Able to follow the development of science and technology as a supporter of lifelong learning
	7. Analyze chemical concepts and mindsets oriented to life skills
Specific Skills	8. Applying chemical science to support productive and innovative behavior to overcome problems in societ
	9. Integrate mathematical and scientific concepts to solve problems in chemistry
	10. Having the ability to innovate in chemical research techniques

### G. Curriculum

Achievement of the PLO is done by lecturing activities that are distributed into compulsory subjects and elective courses. The Chemistry undergraduate program curriculum which consists of compulsory and elective courses with the number of credits can be seen in Table 3.

Table 3. Bachelor of Science in Chemistry Curriculum

Type of Course	SCS	ECTS	Description
Mandatory Courses	133	218	-
Elective Courses	12	20	Selected from 54 credits provided. Elective courses are grouped into 3 fields of study, namely renewable and functional materials group, biological chemistry and environmentally friendly chemistry.
Total	145	238	

### H. Course Distribution

The distribution of courses in each semester in Bachelor of Science in Chemistry is presented in Table 4a and Table 4b.

Table 4a. Course Distribution

Semester	Course Code	Course Name	SKS	ECTS
I	MKU 6301	Islam Education	3	
	MKU 6302	Catholic Education		
	MKU 6303	Christian Education		
	MKU 6304	Buddhist Education		



	MKU 6305	Hinduism Education		
	MKU 6306	Confucianism Education		
	MKU 6207	Civic Education	2	
	KIM 6401	General Chemistry	4	
	KIM 6302	Physics for Chemistry	3	
	KIM 6303	Biology for Chemistry	3	
	KIM 6304	Mathematics for Chemistry	3	
	MKU 6210	Statistics	2	
<b>Total Workload for the 1st Semester</b>			<b>20</b>	<b>33</b>
II	MKU 6208	Pancasila	2	
	MKU 6214	Socio-cultural Education	2	
	KIM 6405	Chemical equilibrium	4	
	KIM 6407	Fundamentals of Organic Chemistry	4	
	KIM 6409	Inorganic Non-Metallic Chemistry	4	
	KMA 6215	Introduction to Computer Sciences	2	
	MKU 6212	Entrepreneurship	2	
<b>Total Workload for the 2nd Semester</b>			<b>20</b>	<b>33</b>
III	MKU 6211	English	2	
	KIM 6406	Molecular Dynamics	4	
	KIM 6408	Reactivity and Mechanism of Organic Reaction	4	
	KIM 6310	Inorganic Metal Chemistry	3	
	KIM 6411	Fundamentals of Analytical Chemistry	4	
	KIM 6215	Environmental Chemistry	2	
	KMA 6212	Chemical Laboratory Management	2	
<b>Total Workload for the 3rd Semester</b>			<b>21</b>	<b>34</b>
IV		Mathematics and Natural Sciences Insights and Studies	2	
	AMF 6201			
	KIM 6412	Chemical Separation Method	4	
	KIM 6413	Biochemistry	4	
	KMA 6205	Physical Organic Chemistry	2	
	KMA 6408	Coordination Chemistry	4	
KMA 6317	Chemical Process Industry	3		
<b>Total Workload for the 4th Semester</b>			<b>19</b>	<b>31</b>
V	MKU 6209	Bahasa Indonesia	2	
	KIM 6204	Polymer Chemistry	2	
	KMA 6306	Structural Analysis of Organic Chemical Compounds	3	
	KMA 6201	Quantum Chemistry	2	
	KMA 6511	Instrumental Chemistry	5	
	KMA 6214	Physical Biochemistry	2	
	KIM 6216	Pharmaceutical chemistry	2	
	KMA 6218	Selected Topics on Chemical Research	2	
<b>Total Workload for the 5th Semester</b>			<b>20</b>	<b>33</b>
VI	KIM 6214	Nuclear Chemistry	2	

	KMA 6216	Computational Chemistry	2	
	KMA 6203	Surface Chemistry and Colloids	2	
	KMA 6210	Crystallochemistry	2	
	KMA 6213	Separation and Analysis of Chemical Compounds Method	2	
	KMA 6219	Industrial Management	2	
	KMA 6320	Research Methodology in Chemistry.	3	
		Elective course 1	2	
		Elective course 2	2	
		Elective course 3	2	
<b>Total Workload for the 6th Semester</b>			<b>21</b>	<b>34</b>
VII	KMA 6202	Atomic and Molecular Spectroscopy	2	
	KMA 6207	Natural Products Chemistry	2	
	KMA 6209	Chemical Application of Group Theory	2	
	PKL6302	Fieldwork practice	3	
		Elective course 4	2	
		Elective course 5	2	
		Elective course 6	2	
	MKU 6313	Community Service	3	
<b>Total Workload for the 7th Semester</b>			<b>18</b>	<b>30</b>
VII	KMA 6621	Thesis	6	
<b>Total Workload for the 8th Semester</b>			<b>6</b>	<b>10</b>
<b>Total SKS</b>			<b>145</b>	<b>238</b>

Table 4b. Distribution of Elective Course

Semester	Course Code	Course Nam	SKS	ECTS
<b>Study fields: Renewable and Functional Material Groups</b>				
VI	KMA 6224	Structure Analysis of Innorganic Compound	2	
	KMA 6225	Nanochemistry Technology	2	
	KMA 6226	Bioinnorganic	2	
	KMA 6229	Membrane Technology	2	
VII	KMA 6222	Synthesis of Innorganic Chemistry	2	
	KMA 6223	Solid State of Innorganic Chemistry	2	
	KMA 6227	Organometallic	2	
	KMA 6228	Material Chemistry	2	
	KMA 6230	Catalyst Chemistry	2	
<b>Total</b>			<b>18</b>	<b>30</b>
<b>Study fields: Biological chemistry</b>				
VI	KMA 6233	Reaction Mechanism of Organic Compound	2	
	KMA 6234	Medicine Chemistry	2	
	KMA 6237	Food Material Chemistry	2	
	KMA 6239	Molecular Biotechnology	2	
VII	KMA 6231	Organic Chemistry Synthesis	2	

Semester	Course Code	Course Nam	SKS	ECTS
	KMA 6232	Isolation and Identification of Natural Material Compounds	2	
	KMA 6235	Toxicology	2	
	KMA 6236	Enzymology	2	
	KMA 6238	Petroleum Chemistry and Energy	2	
	KMA 6240	Fundamentals of Microbiology	2	
<b>Total</b>			<b>20</b>	<b>33</b>
<b>Study fields: Biological chemistry</b>				
VI	KMA 6243	Analysis of Industrial Materials	2	
	KMA 6244	Radioanalysis	2	
	KMA 6245	Chemical Engineering Operations	2	
	KMA 6246	Hazardous Waste Management	2	
VII	KMA 6249	Geochemistry	2	
	KMA 6241	Electrochemical Analysis	2	
	KMA 6242	Corrosion and Electroplating Chemistry	2	
	KMA 6247	Surfactants and Additives Materials	2	
	KMA 6248	Physical Methods for Analysis of Chemical Compounds	2	
<b>Total</b>			<b>18</b>	<b>30</b>

### I. Course Description

Descriptions of each course can be seen in Table 5.

Table 5. Course Description

No	Course	Description
1	Islam Education	This course trains the students to be good personalities (kaffah) using Islamic values as the foundation of thinking and interaction based on their background knowledge and professions. The concept of kaffah can only be achieved by practicing their beliefs and piety to God by building islamic knowledge, religion dispositions, islamic skills, islamic commitment, moslem confidence, and islamic competence
	Catholic Education	This course discusses the concept of human and his origin; his call, pluralism in religion; on how Jesus preaches about Allah's kingdom; on how Jesus finishes his salvation; Allah the trinity; the church comes from Jesus Christ and his delegacy; Maria in the history of salvation; and being religious in the context of national level, the development of IT, Catholic marriage, as well as social and moral problems.
	Christian Education	This course provides students with spiritual training and guidelines in order to be able to run daily activities as a spiritually responsible human being.
	Buddhism Education	This course discusses the basic concept of Buddhism including theology, human, laws, morality, culture and IT as the introduction for Buddhists.
	Hinduism Education	This course discusses the introduction, God the one and only, human, ethics, IT and science, harmony for religious people,

No	Course	Description
		arts, culture, politics, and leadership from the perspectives of Hinduism.
	Confucianism Education	This course discusses the urgency of holding a belief/religion in everyday life. It includes a study of the source of Confucianism values, the history of Confucianism, and expects students to practice the Holy Way brought by the Great Teachings (Thai Rights), and the role of Confucianism in the development of science and technology.
2	Civics Education	This course discusses civil education, democracy, laws, and multicultural values for students in order to make them realize their rights and responsibilities, be skillful and be morally good to build the country.
3	General Chemistry	This course discusses atomic theory, periodic table elements, chemical bonds, stoichiometry, introduction to chemical thermodynamics, chemical kinetics, chemical equilibrium, acid base, colligative properties of solutions, and redox and electrochemical reactions. Lectures also study the application of basic chemical concepts in everyday life, as well as laboratory activities
4	Biology for Chemistry	This course discusses the basic concepts in biology, objects of living organization, and scientific methods, principles, laws, theories and basic skills to apply scientific process through lab practices
5	Physics for Chemistry	This course discusses the introduction to physics, vector analyses, kinematics, dynamics, constant and resilience, heat, coefficient of linear expansion, fluid mechanics, static and elastic equilibrium, the first law of thermodynamics, kinetic theory of gasses, and the second law of thermodynamics.
6	Mathematics for Chemistry	This course will also include the study about mathematical concepts and their applications in chemistry. The concept includes: coordinate systems, functions of one or more variables, differential-integrals, differential equations, determinants, operators and vectors and data processing.
7	Statistics	This course discusses the basic concept of statistics, data description, probability, probability distribution, hypothesis testing, and samples of interpretation
8	Pancasila	This course elaborates the basic concept, existence, and implementation of Pancasila as the foundation of the country in every aspect of the society. It especially includes course introduction, Indonesian history, Pancasila as the foundation of the country, Pancasila as the ideology of the country, symbols in Pancasila, Pancasila as the philosophical system, Pancasila as the ethic system, and the implementation of Pancasila (the analysis of Pancasila's nature).
9	Social Culture Education	This course elaborates not only the concepts of human diversity, equality and equity as individual beings or parts of society, but also aesthetics, courtesy, and cultural value as a guidance to live in harmony for civil society.
10	Chemical Equilibrium	Chemical Equilibrium subjects discuss the concept of gas and its properties, the first law of thermodynamics and its application, thermochemistry, the second and third laws of

No	Course	Description
		thermodynamics and their application, chemical balance, phase balance, physical properties of solutions, and electrochemical balance.
11	Fundamentals of Organic Chemistry	This lecture covers theory and practice which includes material 1). The basic concept of organic reactions is the structure of organic molecules, resonant and conjugations. 2). structure, nomenclature, nature, reaction and conformation of alkanes and cycloalkanes. 3). structure, nomenclature, properties and reactions of alkene and alkyne compounds. 4). structure, nomenclature, properties, and reactions of halo alkane compounds 5). structure, nomenclature, aromaticity and reaction of benzene compounds and their derivatives. 6). structure, nomenclature, nature and reaction of alkanol, aloxy alkoxy, diol and thiol compounds. 7). structure, nomenclature, nature and reaction of alkanal and alkanon compounds. 8). structure, nomenclature, nature and reaction of alkanonic acid compounds. 9). structure, nomenclature, nature and reaction of alkanonic acid derivatives. 10). structure, nomenclature, properties and reaction of amine nitrogen compounds
12	Inorganic Non-metal Chemistry	This course covers theories and practices which include: hydrogen and polyatomic atomic structures, periodic trend elements, symmetry and group molecular theory, covalent bond models (valence bond theory and molecular orbital theory), acid-base and donor-acceptor chemistry, chemical reactions (oxidation-reduction), and group chemistry main non-metal
13	Computer Knowledge Introduction	This course aims to introduce various basic application programs, word processors and data processors for writing, analyzing, and presenting. Lecture material includes the use of Microsoft Word to support report writing or chemical articles, Microsoft PowerPoint for presentations, Microsoft Excel for research data analysis, and chemistry applications to support chemistry studies and research
14	Entrepreneurship	This course aims to equip students in building spirit / soul and character of entrepreneurship, understanding the concept of entrepreneurship, and practicing entrepreneurial skills. The scope of this subject matter includes: spirit / soul development and entrepreneurial character, achievement motivation, creative thinking, entrepreneurial nature, business ethics and social responsibility, seeking new ideas, production management, finance, marketing and HR, business opportunities, business plans.
15	English	This course trains students to be able to master four basic skills in English namely reading, writing, listening, and speaking so that they are able to write and communicate using English in the context related to chemistry
16	Molecular Dynamics	This course studies about the molecular dynamics, which include the theory of gas kinetics, moving molecules (including gases and solutions), the rate of chemical reactions (including: empirical chemical kinetics and explanation of the

No	Course	Description
		law of speed), and complicated reaction kinetics. This course also learn about the theory and practicum in the laboratory.
17	Reactivity and Mechanism of Organic Compound	The subject of organic compounds' structure and reactivity contains concept, structure, physical and chemical traits and reaction mechanism on carbonyl compound (aldehyde and ketone), amide, aromatic compound, aromatic heterocyclic, stereochemistry, compound with poly-functional groups, carbohydrate, lipids, amino acid, and protein.
18	Inorganic Metal Chemistry	This course consists of Chemical Qualitative and Quantitative Analysis. Qualitative analysis is the identification of sample components with specific reagents. Quantitative analysis is the determination of quantities (grams, percent) by volumetric techniques. Lecture emphasizes the mastery of lecture material logically and scientifically and the ability to use scientific methods to solve problems faced by students.
19	Fundamentals of Analytical Chemistry	The basics of analytical chemistry include Chemistry Qualitative and Quantitative Analysis. Qualitative analysis is the identification of sample components with specific reagents. Quantitative analysis is the determination of quantities (grams, percent) by volumetric techniques. Lecture emphasizes the mastery of lecture material logically and scientifically and the ability to use scientific methods to solve problems faced by students.
20	Environmental Chemistry	This course provides experience for students to analyze chemical concepts related to the interaction of chemicals with the biotic, abiotic, and social environments. Lecture material is focused on the sources, reactions, transportation, effects and fate of chemical species in the air, water and soil environment, and also the influence of human activities on these processes. Lectures are carried out with discussions, demonstrations, and assignments that provide students with experience in solving environmental problems.
21	Chemistry Laboratory Management	This course discusses the basic concepts of (1) the understanding, purpose and scope of laboratory management, (2) laboratory understanding and function, (3) laboratory design and layout, (4) tool management, (5) material management, (6) tool selection criteria, (7) work safety in a laboratory, (8) assessment of learning activities in the laboratory, (9) management of laboratory waste, (10) hazardous experimental techniques, (11) MSDS.
22	Insight and Analysis of Natural Science Materials	This lecture includes theories about how to integrate various scientific sciences for the benefit of the development of chemistry. The course consists of: 1) Photosynthesis and the Biological Chain, 2) Science Philosophy, 3) Scientific Method, 4) Statistics, 5) The Role of Chemistry as the Center for Other Natural Sciences, 6) Role of mathematics and sciences in Technology Research and Development
23	Chemical Separation Method	This course deals with various principles of analytic separation, several factors that influence, electrochemical separation and analysis methods and separation with membranes.



No	Course	Description
24	Biochemistry	This course studies the chemical structure, function, chemical processes in cells (the smallest part of living things) which consists of carbohydrates, fats, proteins, enzymes, minerals, vitamins and water in the chemical process (metabolism) of carbohydrates, lipids and proteins. Discussing about nucleic acids, genetic engineering, hormones, nutrition and food, as well as practice about the nature and chemical reactions of carbohydrates, lipids, proteins and enzymes.
25	Physical Organic Chemistry	This course in Physical Organic Chemistry includes theories that include stereochemical material, stereochemical reactions, types of organic chemical reactions (substitutions, additions, eliminations, molecular rearrangements, oxidation, reduction) and reactions to aromatic compounds.
26	Coordination Chemistry	Inorganic Chemistry Coordination explains the typical properties of transition elements with regard to electronic configuration, oxidation rates, formation of complex compounds, colors, catalytic roles, and magnetic properties, and understanding Russell-Saunders coupling with spectroscopic terms, boundaries of complex compounds, types of ligands, coordination numbers, formula writing, naming, the development of the theory of bond formulations in complex compounds according to the Blomstrand-Jorgensen chain model, and Werner's model, geometric shapes, and isomers of complex compounds, the concept of effective atomic numbers, and valence bond theory (VBT), field theory crystals (CFT), dia- / para-magnetic, high- / low-spin magnetic properties, magnitude of orbital divisions d by the strength of the CFT model crystal field, molecular orbital theory (MOT); the magnetic properties of dia- / para-magnetic, high- / lowspin, and the level of covalance of the MOT model, the concept of stability according to the thermodynamic and kinetics aspects, the SN1-SN2 sustaining reaction mechanism, the trans effect, outer / inner-ball redox, and acid reaction complex compound bases, superconducting formula structures, electronic configurations typical for the lantanoide (4f) and actinoide (5f) series, characteristics of stable oxidation states, magnetic properties, lantanoide contractions, 4f orbitals and 5f orbitals.
27	Chemical Industrial Process	Chemical industrial process courses consist of theories, containing material on: Chapter I: Introduction, Chapter II. The production process in the Chemical Industry includes Industry: Sugar Cane, Paper, Petroleum, Portland Cement, Ammonia, Urea Fertilizer, Textile and Milk Powder, Chapter. III. Sulfonation Process, Chapter IV: Stoichiometry in Industry
28	Bahasa Indonesia	This course discusses the development, position and function of Bahasa Indonesia; its kinds; standardized spelling in Bahasa Indonesia; words and dictions; effective sentences in Bahasa Indonesia; paragraph; texts; topics for scientific writing; text convention and editing; structure of scientific writing; quotation and reference.



No	Course	Description
29	Polymer Chemistry	Discuss the basic concepts of polymer science, polymerization reactions, polymerization characterization, polymeric properties and polymer development based on research that has been done. Development of basic concepts and global trends in polymer science
30	Structural Analysis of Chemical Organic Compound	Structure Analysis courses for organic chemical compounds include the basic concepts of spectroscopy, the basic principles of UV, IR, NMR and MS spectroscopy, as well as structure elucidation of organic compounds based on the spectroscopic data.
31	Quantum Chemistry	Quantum Chemistry courses include learning about basic concepts in quantum mechanics, hydrogen atoms, approximation methods, quantum chemical calculations, molecular orbitals and molecular structures and chemical reactions.
32	Instrumental Chemistry	This course discusses about colorimetric methods, UV-Vis Spectroscopy, FTIR Spectroscopy, MS, NMR Spectroscopy, AAS, and combined technique. Lecture emphasizes the mastery of lecture material logically and scientifically and the ability to use scientific methods to solve problems faced by students
33	Physical Biochemistry	Through this course students are expected to be able to master biochemical understanding and philosophy, life characteristics, living substance structure, energy transformation, and physical biochemical history, energy metabolism, high-energy phosphate compounds (ATP), and adenylate systems that control the body's metabolism, phosphorylation mechanism oxidative and the occurrence of a series of reactions in the body, structure of proteins, biomembranes and their properties, and various kinds of transport systems in the body of living things.
34	Pharmaceutical Chemistry	Learn about the basic concepts of the development of drug history, methods of administration of drugs, pharmacokinetic principles, pharmacodynamic principles, drug biopharmaceutical aspects, main effects and side effects of drug use, chemical structure of drug molecules, drug-receptor structure interactions and activity the biology, the relationship of structure and drug activity.
35	Selected Chemistry Research Topics	Selected Chemistry Research Topics study various research topics that have been developed and the ethics of writing articles: definition of Ethics and Style of Article Writing in the field of science, chemical aspects, selection of themes from research articles in the fields of organic chemistry, inorganic chemistry, biochemistry, analytical chemistry, and physical chemistry from international and national journals. analysis of research articles on the fields of organic chemistry, inorganic chemistry, biochemistry, analytical chemistry and physical chemistry from international journals and national journals, writing the Report of Analysis Results
36	Nuclear Chemistry	This course discusses changes in nuclear structure due to the reaction in the nucleus (nuclear reaction). Nuclear reaction consists of 2 (two) types, namely nuclear decay

No	Course	Description
		(radioactivity) and nuclear firing reaction (Nuclear Bombardment Reaction). Lecture emphasizes the mastery of lecture material logically and scientifically and the ability to use scientific methods to solve problems faced by students
37	Computational Chemistry	Computational Chemistry courses cover learning about the basic concepts in molecular mechanics and quantum mechanics and their applications especially in studying the structure and dynamics of fluid systems (solvation), theoretical approaches such as HF (Hartree-Fock) theory, DFT (Density Functional Theory) and Force Field Methods (Molecular Mechanics); In this study, it will be studied / demonstrated the use of some computational chemistry software such as Gaussian, Turbomole, Hyperchem and Gromacs in solving chemical problems and interface programs such as Gaussview, Tmolex and VMD in processing data on simulation and modeling results.
38	Surface Chemistry and Colloid	Solid surface structure and its relation to the adsorption-desorption process and its mechanism and analysis techniques on the surface. Like the properties of colloids and interfaces, emulsions and foams and the factors that affect colloidal stability, and apply these concepts in some cases.
39	Crystallochemistry	Crystallochemistry courses are courses for students of Bachelor of Education in Chemistry with descriptions including: chemical structure description, symmetry and molecular groups, chemical bonds and lattice energy, molecular structures 1 (compounds of the main group elements) and 2 (transition metal compounds), crystal gratings, symmetry and groups crystals, X-ray diffraction instruments and determination of simple crystal structures. This course aims to enable students to understand the structure and grid contained in molecular compounds 1 and 2.
40	Separation Method and Chemical Compound Analysis	This lecture examines various principles of analytic separation, several factors that influence, electrochemical separation and analysis methods and separation with membranes
41	Industrial Management	The Industrial Management course is a course consisting of theory and making papers in groups, then presented. In theory explained about: the role of graduates of chemical study programs in a chemical industry, what abilities must be possessed by graduates to enter the workforce. In the next chapter, it is explained about production management and operations. Chapter II explains the safety and prevention of accidents. Chapter IV discusses how the stages of designing a chemical industry, and in Chapter V describes how industry managers strive to create a chemical industry that is ready for competitiveness and environmentally friendly. In making papers in groups, students make the design of a chemical factory; which includes: Name of industry, background why the industry was founded, things to think about when establishing a chemical industry, the purpose of the

No	Course	Description
		establishment of industry, production processes, organizational structure, safety of work and accident prevention.
42	Chemistry Research Methodology	This course is about designing useful chemical research projects, conducting research, presenting research results and reporting them.
43	Atomic and Molecular Spectroscopy	The course discusses the basic concepts of spectroscopy, and structure of molecular compounds. Molecular Symmetry, Group theory and character tables, Rotation Spectroscopy, Vibration Spectroscopy, Electronic Transition Spectroscopy, Photoelectron and laser spectroscopy, Core magnetic resonance spectroscopy, Electron magnetic resonance spectroscopy, and Its application in chemical systems
44	Natural Material Chemistry	This course covers the classification, structure, nature, origin of biogenesis, biosynthesis, ways of isolation, and its identification which includes classes of terpenoid compounds, steroids, flavonoids, polyketides, polyphenols, alkaloids, as well as several examples of useful natural compounds, found in various families plant
45	Chemical Application of Group Theory	Chemistry Group Theory explains the elements and operations of symmetry, and their application in orbital objects and various chemical geometries, the basic requirements of a point group, and their application in determining the character of non-generic representations, matrices for degenerate representations to construct character tables, application of group theory in the theory of chemical bonds: hybridization models for various simple and complex molecules, application of group theory in chemical bond theory: hybridization models for various simple and complex molecules, application of group theory in molecular orbitals for various simple molecules.
46	Internship	This course helps students to portray how to work in industry, company or even in research institution
47	Community Service	This course helps students to apply and integrate their knowledge in formulating problem and finding the potential of certain area based on knowledge and IT through experiential learning and direct practices.
48	Undergraduate thesis	This course helps students to implement the basic concept of scientific research based on their expertise by designing, executing, reporting and defending their research in the under graduate thesis defense.
49	Structure Analysis of Inorganic Compounds	This course discusses elucidation of inorganic materials using UV-Vis Spectrometer, FT-IR, X-Ray Diffraction (XRD), and SEM instruments. The study focuses on the relation between the structure and properties of inorganic salts, coordination compound, aluminosilicate materials (zeolite, clay), and metal oxide.

No	Course	Description
50	Nano chemistry Technology	This course discusses Nano Technology, Nano Science and Nanotechnology in Indonesia. The lecture also discussed Nanotools, Nanofabrication, Characterization of Nano Structures, Nano Structure Materials, Nanoparticles and Nanocapsules. Through Nanochemical Technology courses, students are expected to understand the concepts in Nanotechnology and be able to apply these concepts in a study.
51	Bioinorganic Chemistry	This course discusses the function and mechanism metal elements transport in the physiologic system. The lecture improves advance knowledge to apply several basic concepts in coordination chemistry in predicting function and reactivity of biomolecule metal based on its structure.
52	Membrane Technology	The course discusses the basic concepts of membrane technology, contain: the understanding of membranes, making membranes, processes and how membranes work and their utilization.
53	Synthesis of Inorganic Compound	This course discusses basic principal and influent factors of chemical reaction to produce inorganic materials. The study also elaborates the method of synthesis and several approach that can be applied. Lecture emphasizes the student's knowledge logically and scientifically to improve the ability to use scientific methods to solve problems relating how to synthesis a specific inorganic material.
54	Solid State of Inorganic Chemistry	Courses of Solid Sate Inorganic Chemistry are courses for students of Bachelor of Education in Chemistry wit descriptions including: description of solid state chemistry, single crystal and polycrystalline, preparation of single crystal, synthesis and characterization of single crystals, physical characterization of solid material, solid solution, and crystal defect.
55	Organometallic Chemistry	This course studies organometallic compounds, chemical compounds containing at least one chemical bond between a carbon atom of an organic molecule and a metal, including alkaline, alkaline-earth, and transition metals.
56	Material Chemistry	This course discusses various aspect of chemistry in the design and discovery of new as an important role to synthesis future functional materials. It advance understanding how the history of a material influences its structure, properties, and performance. Lecture emphasizes the mastery of lecture material logically and scientifically and the ability to use scientific methods to solve problems faced by students
57	Catalyst Chemistry	Catalyst Chemistry Course discusses the concept of catalysts, types of catalysts, synthesis, properties and applications in life.
58	Mechanism Reaction of Organic Compounds	This course provides experience for students to study the factors that influence the mechanism of organic reactions, the mechanism of organic chemical reactions based on the structure and reactivity of functional groups, as well as the mechanism of radical reactions and their applications of organic compound reactivity.

No	Course	Description
59	Medicinal Chemistry	This course studies about the working relationship of drugs, the relationship between chemical structure and biological activity of biodynamics through physical properties and chemical reactivity of compounds.
60	Food Material Chemistry	This lecture is an activity that broadens students' understanding of the basic concepts of foodstuffs and chemical compounds related to foodstuffs including humidity, carbohydrates, proteins, fats, minerals, vitamins, additives and polluting elements, analysis of these chemical compounds in foodstuffs and current trends in food research. Lectures are carried out through inquiry and expository approaches through classical lectures, discussions, independent assignments and seminars using computer-aided media.
61	Molecular Biotechnology	This course discusses about the fundamental of understanding of microbes and their applications in various ways the field of life, the understanding of the microbial world which includes aspects of morphology, physiology, genetics, microbial cultivation, the role of microbes in various fields of human life, such as medical microbiology, food microbiology, and the environment.
62	Synthesis of Organic Compound	This lecture contains a discussion of concepts about: the principles of the disconnection approach; basic principles of aromatic compound synthesis; sequence of steps in the synthesis of organic compounds; disconnection of one C-X group: derivative of RCO carbonyl compounds. X derivatives of carboxylic acids, alcoholic compounds, alkyl halides, sulfides, ethers; chemoselectivity; disconnection of two C-X groups: 1,1-difunctional compound, 1,2-difunctional compound, 1,3-difunctional compound; amine synthesis, protective group. Nucleophilic addition to the double bond.
63	Isolation and identification of the structure of compounds of natural product	This course discusses Learn various isolation techniques and identify the structure of organic compounds of natural materials, which include classes of compounds: terpenoids, steroids, flavonoids, polyketides, polyphenols, alkaloids, as well as some examples of useful natural compounds, found in plant families. Lecture emphasizes the mastery of lecture material logically and scientifically and the ability to use scientific methods to solve problems faced by students
64	Toxicology	This course studies about the direction of toxicology, general principles and toxicology mindset, acute dose - chronic dose and dose response relationship, type of subject situation, toxicity, absorption, distribution, excretion, reactions that occur by hydrolysis oxidation reduction conjugation in air contaminants air contaminants and drugs, various kinds of toxicology, the use of toxicology
65	Enzymology	This course studies about the structure and function of enzymes, the understanding of enzymes, enzyme classification and enzyme nomenclature, enzyme monomers and oligomers, the factors that influence enzyme work, the kinetic of enzyme reaction: the molecular mechanisms of enzymatic reactions, the mechanisms of enzymatic reaction

No	Course	Description
		without cofactors, enzyme involvement in enzymatic reactions, the kinetics of enzymatic reaction with one substrate, relationship of initial reaction rate with concentration, inhibition, allosteric enzymes. Enzyme application in industry, isolation and purification of enzymes and immobilization enzyme.
66	Petroleum Chemistry and Energy	Chemistry course Petroleum Chemistry explains to students the importance of petroleum mining and its results for life and human activity in general. In this course, the process of formation of the earth oil is explained, the process of processing it into a product that can be used. Besides that, he also explained about some petroleum products, including: how to manufacture, chemical and physical properties, as well as quality standards. In addition, this course also explains the stages in the design of the establishment of the petroleum refining industry.
67	Fundamental of Microbiology	This course discusses about the fundamental of understanding of microbes and their applications in various ways the field of life, the understanding of the microbial world which includes aspects of morphology, physiology, genetics, microbial cultivation, the role of microbes in various fields of human life, such as medical microbiology, food microbiology, and the environment.
68	Industrial Material Analysis	This course discusses about Introduction, Industry and Water, Steel Industry, trace element analysis in minerals, Cement Industry, Paint Industry, Glass Industry and Ceramic Industry. Lecture emphasizes the mastery of lecture material logically and scientifically and the ability to use scientific methods to solve problems faced by students
69	Radioanalysis	This course discusses the chemical properties of the radioactive nuclide, its measurement of radioactivity, and its use in the analytical field. The subject of radioanalysis covers the concepts of radioactivity, measurement of radioactivity, atom chemistry, application of radionuclides in the analytical field, applications of radionuclides in engineering and industry.
70	Chemical Engineering Operations	This course contains material about: Introduction, Concepts of Mass balance, Steam-Liquid Balance and Distillation, Evaporation Process, Liquid Pumping
71	B3 Waste Management	This course provides experience to students to analyze the physicochemical properties of B3 waste and its management related to environmental health. Lecture materials are focused on 1) Definition, nature and classification of B3 waste, 2) Regulations related to B3 Waste Management, 3) Identification, documents, symbols, labels, packaging, storage, collection, transportation, processing, utilization, stockpiling and final disposal of waste B3, 4) Emergency response system in the processing of B3 waste, 5) Hospital waste treatment, 6) Processing of chemical laboratory waste, 7) Processing of chemical industry waste, 8) Printing waste treatment. Lectures are conducted with discussions,



No	Course	Description
		demonstrations, and assignments that provide experience to students to solve the problem of B3 waste management.
72	Geochemistry	This course covers theories that include material; the principles and history of geochemical science, earth and its relationship to the universe, the structure and content of the earth, thermodynamics and chemistry of crystals, magmatism and igneous rock, sedimentation and sedimentary rocks, and isotope geochemistry.
73	Electrochemical Analysis	This course will also include the study about electrochemistry concepts and their applications in analytical chemistry. The concept includes: Chemical change and electric energy electrolysis (redox reactive that require energy to occurs), galvanic or voltaic cells (reaction that provide energy when the occurs) Coverage of the materials: Electrolysis cells and galvanic cells, Potentiometry Electrogravimetry, Polarography, Voltammetry
74	Corrosion and Electroplating	This course discusses about the concept of corrosion and its prevention, as well as electroplating and its uses. The concept of corrosion and its prevention include Concept of Corrosion, Basics of Corrosion, Electrochemical Corrosion, Thermodynamics of Corrosion, Corrosion Kinetics and Electrochemical Applications, Know Forms of Corrosion, Factors Affecting Corrosion, Corrosion due to Water, Atmospheric Corrosion, Corrosion in Soil and Effect of Microbiology, Selection Material, Test and Design, Corrosion Risk, Cathodic Protection, Coating, Corrosion at High Temperature.
75	Surfactants and Addictive Materials	Application of the structure of surfactants and their additives relationship with the mechanism process. Students also describe the properties of interface surfactants, as well as the factors that influence their work processes, and apply these concepts in some cases.
76	Physical Methods to Analyze Chemical Compounds	Discuss the basic concepts and various physical methods for the analysis of chemical compounds, as well as the development of physical methods in the analysis of chemical compounds based on research that has been done.

#### J. Facility

The Chemistry Bachelor Program has adequate facilities to carry out its duties and functions in educating Chemistry Bachelor candidates. These facilities include the following.

##### 1. E-learning

Lecture / assistance activities are available adequate lecture buildings and are arranged centrally by the faculty. Lecture activities can already be done by e-learning, by accessing the address: <http://besmart.uny.ac.id/v2/>.

##### 2. Laboratory

For practical activities, a 3-storey chemical laboratory building has been built covering an area of 2,100 m<sup>2</sup>. Bachelor of Science in Chemistry facilities, FMIPA, UNY are available quite complete. Laboratory facilities provided include Basic Chemistry, Organic Chemistry and Biochemistry, Physical and Inorganic Chemistry, and Analytical Chemistry



to carry out practicum-based learning activities. As for research activities, separate laboratory research facilities have been provided. Integrated laboratories containing chemical instruments to analyze research samples are also available. Furthermore, there is a computer laboratory that has 44 computers and is connected to a Local Area Network (LAN) with the FMIPA UNY environment that can be utilized for practicum in computer applications, chemical computing, preparation of computer-assisted learning materials, analysis of chemical education research data analysis, and access to global information through internet and e-library. Examples of practicum activities in chemical laboratories can be seen in Figure 1.



Figure 1. Laboratory work activities in the Chemistry Laboratory

### 3. Library

To support students in the context of searching references (library materials), Department Libraries are provided, in addition to Yogyakarta State University Library. An overview of the library can be seen in Figure 2.



Figure 2. Overview of the Chemistry Bachelor Program Library

The profile of the book library collection is presented in Table 6 below.

Table 6. Profile of Library Book Collection Program in Chemistry

Type of Library Material	Title	Copies
Text Book	774	3191

Type of Library Material	Title	Copies
Dictate	78	3271
Journal	17	517
Undergraduate Thesis	386	386
Thesis	46	46
Magazine	2	30
Reference Book	111	130
Research Report	1264	1264
Others	16	47
Total	2078	6501

#### 4. Academic Guidance

There is the most effective consultation and assistance facility to support student academic achievement in the form of academic guidance conducted by academic advisors. Each new student, accompanied by one academic advisor. This assistance by an academic advisor provides an opportunity for students to consult related to academic problems that are difficult to be solved independently by students. Academic advisors try to find solutions to problems faced by students. Even if academic advisors are needed through study programs, they will invite other parties who are potentially able to solve problems faced by students.

The assistance offered by study programs for students includes academic guidance, counseling guidance, guidance on obtaining scholarships, career guidance, fostering interests and talents, and religious assistance. All forms of consultation and mentoring are well utilized by students to shorten the study period, as well as improve student achievement.

Furthermore, students who are going to take a Final Thesis (TAS) course will be guided by one lecturer who has a functional position of at least a Lector. The thesis supervisors are tasked to help students complete their research as a final project. Supervisors are also tasked to monitor the progress of each student's thesis guidance through a thesis guidance card so they can ascertain or target when students can complete the TAS. Thesis guidance can also be done online through the page <http://bimbingan.uny.ac.id/>. The existence of an online tutoring facility will make it easier for students to consult with supervisors related to TAS flexibly so that students are expected to be able to complete their studies on time.

#### 5. Student Mobility

BSC UNY also organizes students' individual windows mobility. Students are free from significant obstacles in the utilization of individual windows mobility. In addition to students' enthusiasm to take advantage of it, the study programme also opens the broadest opportunity for students who use it. This window mobility can provide students with a broad horizon that is highly beneficial when the graduates jump in the workforce later on. Individual windows mobility can increase courage, communication skills, ability to manage time, and reduce the ego, which is usually still notable in students. There are two students' mobility programmes:

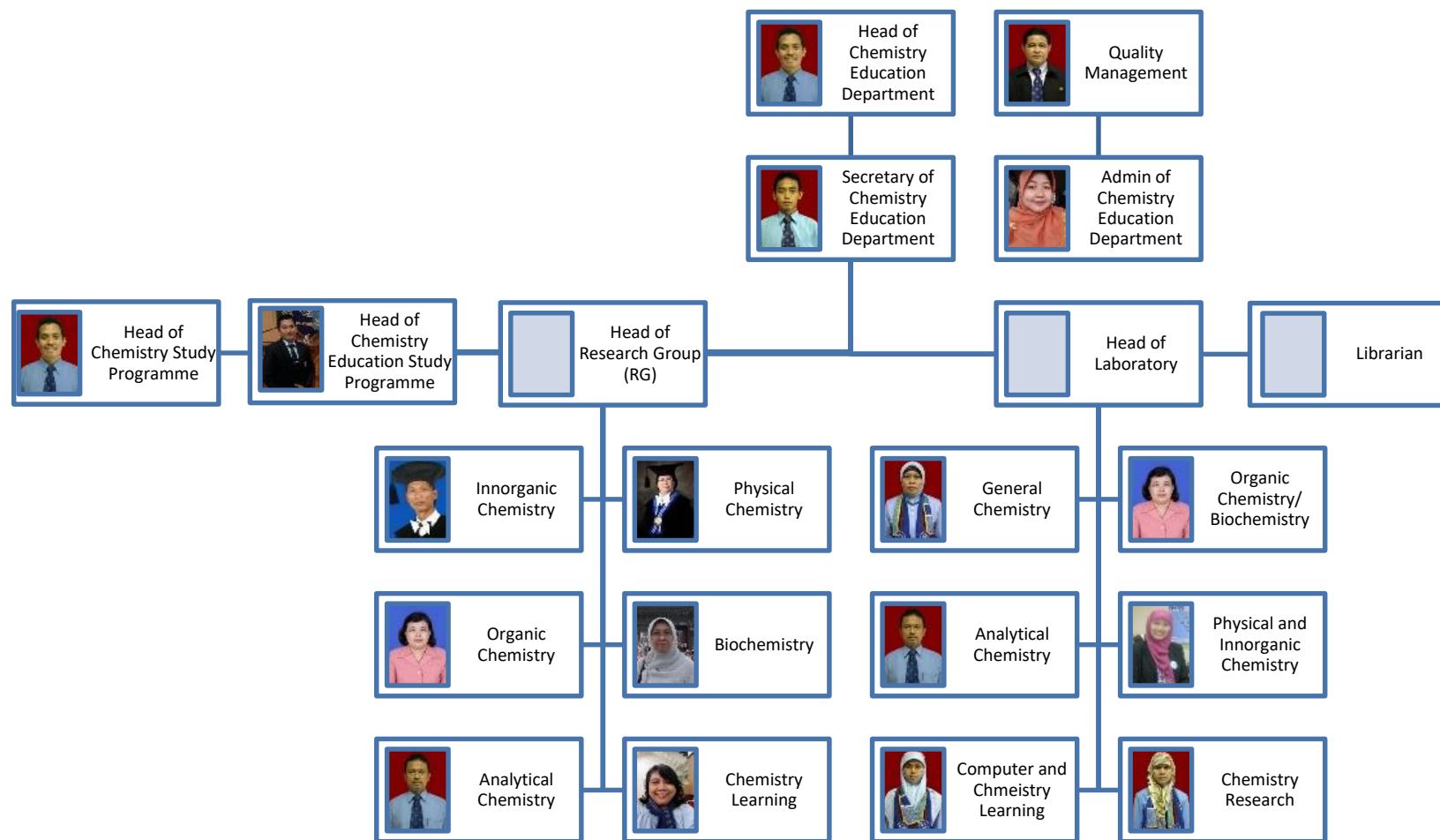
- a. Credit transfer (students exchange) programme. This activity is conducted by transferring and accepting students (students exchange) to study for one semester

at partner universities. The first step done is determining the equivalence of several courses by comparing descriptions of each course from both study programmes at UNY and at partner universities. The credit transfer programme at UNY's BSC is in line with Tanah Air Nusantara Student Exchange Programme (PERMATA) developed by Ministry of Research, Technology and Higher Education. Credit transfer programmes are regulated in the academic regulations of UNY (<http://kimia.fmipa.uny.ac.id/en/content/academic-regulations>) and are detailed in the Rector's Decree concerning UNY Credit Transfer guidelines.

- b. Students internship programme. UNY BSC accepted a student from the Prince Songkhla University (PSU) named Hadibah Kalor. He conducted research internship in order to complete his thesis in the field of Pharmaceutical and Organic Chemistry in May - July 2017. During his research, he was supervised by Prof. Dr. Sri Atun.

#### **K. Organizational Structure of Bachelor of Science in Chemistry**

The organizational structure of the Bachelor of Science in Chemistry can be seen in Figure 3 as follows.



Gambar 3. Struktur Organisasi Program Studi Kimia

Table 7. Organization Structure of Bachelor of Science in Chemistry

No	Position	Name
1	Head of the Chemistry Education Department	Drs. Jaslin Ikhsan, M.App.Sc., Ph.D.
2	Secretary of the Chemistry Education Department	Erfan Priyambodo, S.Pd.Si., M.Si.
3	Head of Bachelor of Science in Chemistry	Drs. Jaslin Ikhsan, M.App.Sc., Ph.D.
4	Head of Bachelor of Science in Chemistry Education	Sukisman Purtadi, M.Pd.
5	Supervising Hima Chemistry	Annisa Fillaeli, M.Si.
6	KBK Organic Chemistry	Cornelia Budimarwanti, M.Si.
7	KBK Inorganic Chemistry	Prof. Drs. AK Prodjosantoso, M.Sc., Ph.D.
8	KBK Chemical analysis	Drs. Sunarto, M.Si.
9	KBK Physical Chemistry	Prof. Dr. Dra. Endang Widjajanti LFX, M.Si.
10	KBK Biochemistry	Dr. Dra. Retno Arianingrum, M.Si.
11	KBK Chemistry Education	Dr. Das Salirawati, M.Si.
12	Head of Basic Chemistry Laboratory	Dra. Susila Kristianingrum, M.Si.
13	Head of Laboratory of Organic Chemistry and Biochemistry	Cornelia Budimarwanti, M.Si.
14	Head of Chemical Analysis Laboratory	Drs. Sunarto, M.Si.
15	Head of the Physical and Inorganic Chemistry Laboratory	Dr. Kun Sri Budiasih, S.Si., M.Si.
16	Head of Chemical Research Laboratory	Dr. Dra. Eli Rohaeti, M.Si.
17	Head of Computer Laboratory and Chemistry Learning	Dr. Antuni Wiyarsi, S.Pd.Si., M.Si.

#### L. Staff

Staff of the Chemistry Bachelor Program, FMIPA, UNY consist of teaching staff and education staff. The teaching staff of Bachelor of Science in Chemistry can be seen in Table 8.

Table 8. Lecturer Bachelor of Science in Chemistry

No.	Name of Permanent lecturer	Date of Birth	Akademik Position	Akademik Degree	Education S1, S2, S3 and origin of tertiary institutions	Field of Expertise for Every Level of Education
1.	Nurfina Aznam	06/12/1956	Professor	Dra.	S1 : UGM	Pharmaceutical chemistry
				M.S. Apt.	S2 : UGM	Pharmaceutical chemistry
				Dr.	S3 : UGM	Pharmaceutical chemistry
2.	KH Sugijarto	15/09/1948	Professor	Drs.	S1 : IKIP Yogyakarta	Chemistry Education
				M.Sc.	S2 : The School of Chemistry, UNSW, Australia	Inorganic Chemistry

No.	Name of Permanent lecturer	Date of Birth	Akademic Position	Akademic Degree	Education S1, S2, S3 and origin of tertiary institutions	Field of Expertise for Every Level of Education
				Ph.D.	S3 : The School of Chemistry, UNSW, Australia	Inorganic Chemistry
3.	AK Prodjoso	28/10/1960	Professor	Drs.	S1 : IKIP Yogyakarta	Chemistry Education
				M.Sc.	S2 : USYD Sydney Australia	Inorganic Chemistry
				Ph.D.	S3 : USYD Sydney Australia	Inorganic Chemistry
4.	Endang Widjajanti Laksono FX	03/12/1962	Professor	Dra..	S1 : IKIP Semarang	Chemistry Education
				M.Si.	S2 : ITB	Physical Chemistry
				Dr.	S3 : Universite de Paris VI, France	Physical Chemistry
5.	Sri Atun	12/10/1965	Professor	Dra.	S1 : IKIP Yogyakarta	Chemistry Education
				M.Si.	S2 : ITB	Organic Chemistry
				Dr.	S3 : ITB	Organic Chemistry
6.	Indyah Sulistyarty	06/04/1951	Professor	Dra.	S1 : IKIP Yogyakarta	Chemistry Education
				M.S.	S2 : UGM	Organic Chemistry
				Dr.	S3 : UGM	Organic Chemistry
7.	Hari Sutrisno	07/04/1967	Professor	Drs.	S1 : IKIP Yogyakarta	Chemistry Education
				M.Si.	S2 : ITB	Inorganic Chemistry
				Dr.	S3 : Universite de Nantes, France	Pinorganic Chemistry
8.	Retno Arianingrum	15/12/1968	Head Lecturer	Dra.	UGM	Chemistry
				M.Si.	UGM	Biochemistry
				Dr.	UGM	Biochemistry
9.	Suyanta	08/05/1966	Professor	Drs.	S1 : IKIP Yogyakarta	Chemistry Education
				M.Si.	S2 : UGM	Chemical Analysis

No.	Name of Permanent lecturer	Date of Birth	Akademic Position	Akademic Degree	Education S1, S2, S3 and origin of tertiary institutions	Field of Expertise for Every Level of Education
				Dr.	S3 : ITB	Chemical Analysis
10.	Sri Handayani	13/07/1970	Head Lecturer	Dra.	S1 : UGM	Chemistry
				M.Si.	S2 : UGM	Organic Chemistry
				Dr.	S3 : UGM	Organic Chemistry
11.	Jaslin Ikhsan	29/06/1968	Head Lecturer	Drs.	S1 : IKIP Yogyakarta	Chemistry Education
				Mapp.Sc.	S2 : La Trobe University, Australia	Physical Chemistry
				Ph.D.	S3 : La Trobe University, Australia	Colloidal and Surface Chemistry
12.	Senam	06/03/1967	Head Lecturer	Drs.	S1 : IKIP Yogyakarta	Chemistry Education
				M.Si.	S2 : ITB	Biochemistry
				Dr.	S3 :Dresden Technische Universitat, Germany	Biochemistry
13.	Eli Rohaeti	29/12/1969	Head Lecturer	Dra.	S1 : IKIP Bandung	Chemistry Education
				M.Si.	S2 : ITB	Physical Chemistry
				Dr.	S3 :ITB	Physical Chemistry (Polymer)
14.	Isana Supiah YL	23/09/1961	Head Lecturer	Dra.	S1 : IKIP Semarang	Chemistry Education
				M.Si.	S2 : UGM	Physical Chemistry
				Dr.	S3 : UGM	Physical Chemistry
15.	Crys Fajar Partana	30/12/1963	Head Lecturer	Drs.	S1 : IKIP Yogyakarta	Chemistry Education
				M.Si.	S2 : UGM	Physical Chemistry
				Dr.	S3 : UGM	Computational Chemistry
16.	Sunarto	08/06/1961	Head Lecturer	Drs.	S1 : UGM	Chemical Analysis
				M.Si.	S2 : UGM	Chemical Analysis
17.				Dra.	S1 : UGM	Chemistry



No.	Name of Permanent lecturer	Date of Birth	Akademic Position	Akademic Degree	Education S1, S2, S3 and origin of tertiary institutions	Field of Expertise for Every Level of Education
	Susila Kristianingrum	14/08/1965	Head Lecturer	M.Si.	S2 : UGM	Chemical Analysis
18.	Cornelia Budimarwanti	30/03/1966	Head Lecturer	Dra.	S1 : UGM	Chemistry
				M.Si.	S2 : UGM	Organic Chemistry
19.	Endang Dwi Siswani	20/11/1954	Lektor Kepala	Ir.	S1 : UGM	Chemical Engineering
				M.T.	S2 : UGM	Chemical Engineering
20.	M. Pranjoto Utomo	08/04/1971	Head Lecturer	S.Si.	S1 : UGM	Chemistry
				M.Si.	S2 : UGM	Physical Chemistry
21.	Karim Theresih	24/08/1956	Head Lecturer	Drs	S1 : IKIP Yogyakarta	Chemistry Education
				S.U.	S2 : UGM	Organic Chemistry
22.	Regina Tutik Padmaningrum	11/09/1965	Head Lecturer	Dra.	S1 : IKIP Yogyakarta	Chemistry Education
				M.Si.	S2 : ITB	Chemical Analysis
23.	Suwardi	22/07/1967	Lecturer	S.Si..	S1 : UGM	Chemistry
				M.Si.	S2 : ITB	Physical Chemistry
				Dr.	S3 : UGM	Computational Chemistry
24.	Kun Sri Budiasih	02/02/1972	Lecturer	S.Si.	S1 : UGM	Chemistry
				M.Si.	S2 : ITB	Chemical Analysis
				Dr.	S3 : UGM	Inorganic Chemistry
25.	Cahyorini Kusumawardani	23/07/1977	Lecturer	S.Si.	S1 : UGM	Chemistry
				M.Si.	S2 : UGM	Inorganic Chemistry
				Dr.	S3 : UGM	Inorganic Chemistry
26.	Siti Marwati	03/01/1977	Lecturer	S.Si.	S1 : UGM	Chemistry
				M.Si.	S2 : UGM	Chemical Analysis
27.	Dyah Purwaningsih	22/07/1978	Lecturer	S.Si.	S1 : UGM	Chemistry
				M.Si.	S2 : UGM	Chemical Environment
28.	Sulistiyani	03/01/1980	Lecturer	S.Si.	S1 : UNY	Chemistry
				M.Si.	S2 : ITB	Chemical Analysis

No.	Name of Permanent lecturer	Date of Birth	Akademic Position	Akademic Degree	Education S1, S2, S3 and origin of tertiary institutions	Field of Expertise for Every Level of Education
29.	Erfan Priyambodo	25/09/1982	Lecturer	S.Pd.Si.	S1 : UNY	Chemistry Education
				M.Si,	S2 : ITB	Chemical Analysis
30.	Dewi Yuanita Lestari	01/06/1981	Expert Assistant	S.Si.	S1 : UGM	Chemistry
				M.Sc.	S2 : UGM	Physical Chemistry
31.	Agus Salim	03/08/1961	Expert Assistant	Drs.	S1 : UGM	Chemistry
				M.Si.	S2 : UGM	Physical Chemistry
32.	Annisa Fillaeli	22/05/1979	Expert Assistant	S.Si.	S1 : UNY	Chemistry
				M.Si.	S2 : UGM	Chemical Analysis
33.	Dini Rahmawati	17/06/1983	Expert Assistant	S.Si.	S1 : UNY	Chemistry
				M.Si.	S2 : UGM	Organic Chemistry
34.	Isti Yunita	21/12/1986	Expert Assistant	S.Si.	S1 : Unnes	Chemistry
				M.Si.	S2 : UGM	Inorganic Chemistry

The educational staff of the Chemistry Bachelor Program consists of laboratory assistants and administrative staff whose data can be seen in Table 9.

Table 9. Education Staff Bachelor of Science in Chemistry

No	Name	Status of Educational Personnel
1	Avian Jaya, A.Md.	Lab Assistant Lab. Basic chemistry
2	M. Aslam	Lab Assistant Lab. Organic Chemistry and Biochemistry
3	Ali Murtono, S.T.	Lab Assistant Lab. Chemical analysis
4	Suparmanto	Lab Assistant Lab. Physical and Inorganic Chemistry
5	Rudi Yuliyanto, A.Md.	Lab Assistant Lab. Computers and Chemistry Learning
6	Yossi Inti Rahmawati, S.E.	Administrative Staff of Chemistry Education Department

### M. Research Group

Chemistry Undergraduate Program, FMIPA, UNY consists of several Expertise Field Groups (KBK). The CBC consists of the following.

1. Center for Electrochemical Studies
2. Center for Chemical Separation & Speciation Study
3. Center for Photocatalytic Chemistry Studies for Environmental Applications
4. Center for Chemical Studies for New and Renewable Energy
5. Advanced and Functional Polymer Study Center
6. Center for Surface Chemistry & Catalyst Study

7. Center for Computational Chemistry Study & Modeling
8. Center for Organic Chemistry Synthesis Study
9. Center for the Study of Natural Chemical Chemistry
10. Center for Biochemical Studies