

The Faculty of Mathematics and Natural Sciences consists of six departments – the Department of Mathematics, the Department of Physics, the Department of Biology, the Department of Chemistry, the Department of Geography and the Department of Pharmacy.

The faculty's vision is to make it a center of excellence in education, research, services in mathematics and science and their application at national and international levels.

The management of the faculty strives not only to maintain its current good standard but it also makes every effort to improve the quality of the faculty so that it is recognized as a faculty which can achieve national as well as international criteria of excellence.

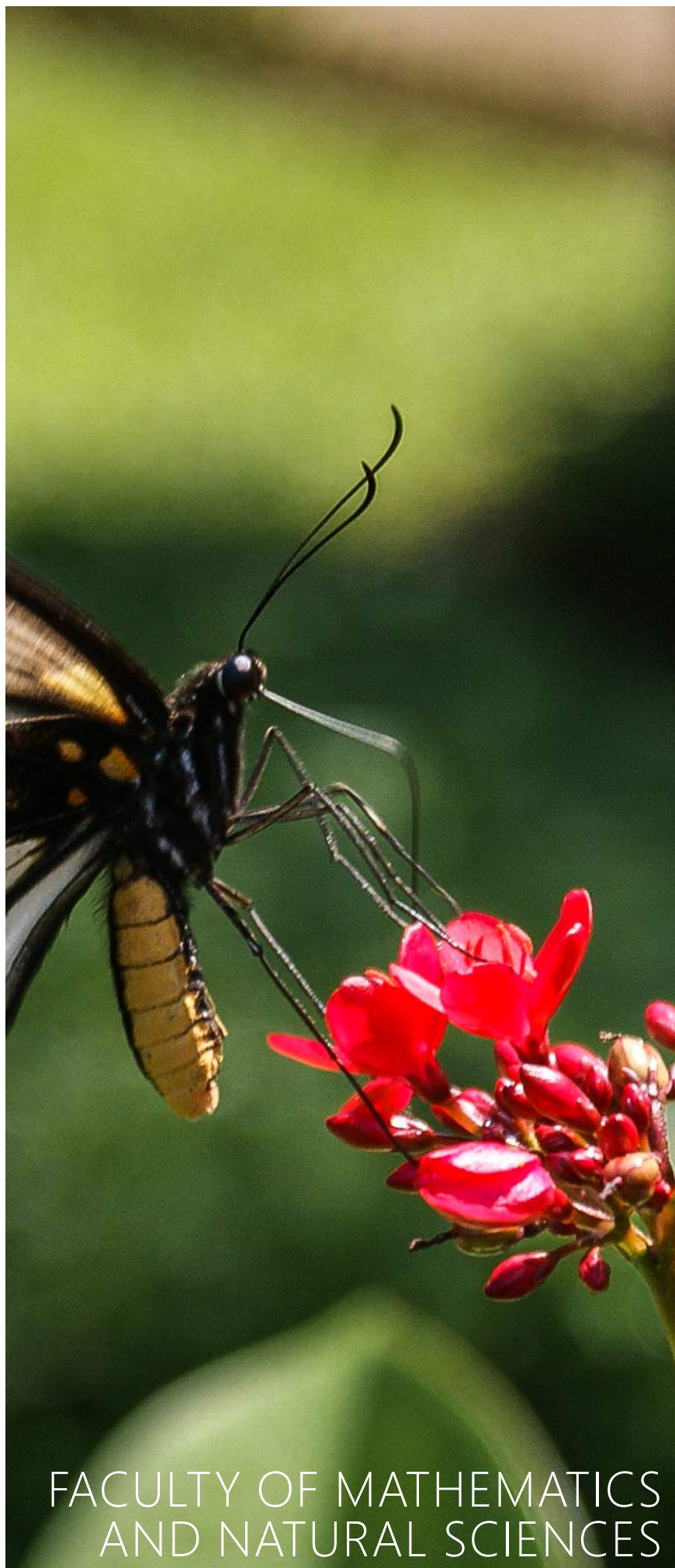
In particular, the faculty is employing all activities that contribute to the achievement of its mission as follows:

- To conduct research-based academic education professionally in order to prepare the students to become future leaders with good ethics, global insight and care for the welfare of the society as well as possessing excellent academic abilities and/or academic professionalism and are thus able to compete both nationally and internationally.
- To support excellent research contribution in science and technology development as well as to conduct excellent academic research.
- To disseminate science and new innovations that is beneficial for society.

Two Centers of Excellence (CoE) are located within the Faculty of Mathematics and Natural Sciences.

CoE Nano Science and Technology (CoE NST) conducts and develops research of both nanoscience and nanotechnology. The study of nanoscience and nanotechnology provides comprehension and control at dimensions of 1 to 10 nanometers, where the unique phenomenon enables novel applications. Nanoscience study focuses on the comprehension of properties at nanometer scale, whereas nanotechnology involves the creation and use of materials and devices by controlling shape and size at nanometer scale.

The purpose of establishing CoE for Indigenous Biological Resources – Genome Studies (CoE IBR-GS) is to promote the utilization of indigenous biological resources for industry through genome-based analysis of scientifically important and industrially/commercially useful biological resources originating from Indonesia. The development of a bioinformatics



## FACULTY OF MATHEMATICS AND NATURAL SCIENCES

database of indigenous biological resources is to enhance research opportunities and to apply industrial uses of biological functions. At the same time CoE IBR-GS will enhance Universitas Indonesia's reputation for teaching and research activities.

#### RESEARCH INTERESTS

- Spatial and geographic science including land management, GIS application, policy studies, urban & regional planning, natural & social hazard mitigation
- Ocean space and resources, marine conservation and environment
- Nanoscience and nanotechnology, material science
- Natural medicine

#### RESEARCH CENTERS

- Research Center of Material Science
- Research Center of Applied Geography
- Center of Natural Medicines
- Center of Computer and Information Technology
- Center of Oceanography,
- Center of Study for Environmental Safety Risk

#### FACULTY CONTACT

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## BACHELOR'S DEGREE

### BIOLOGY

Degree : Sarjana Sains (Bachelor of Science)  
Campus Location : Depok Campus  
Lecture Schedule : Morning/Daytime  
Length of Study : 8 Semesters  
Language : Indonesian  
Accreditation : A

Biology is a challenging field of research and education which covers knowledge on life science along with basic study research for environmental conservation.

The curriculum is designed to prepare students with adequate competence and knowledge in Biology. In order to obtain the bachelor degree, students must complete credits of at least 144 which normally take 4 years of study. The featured fields of study in Biology are as follows.

- Taxonomy
- Physiology
- Ecology
- Genetics
- Microbiology
- Reproduction and Developmental Biology
- Marine Biology

Seven laboratories are established to support the education and research activities within those areas.

The students are able to choose courses offered in the above field of study, which can proceed to the final paper writing.

Facilities for academic resources such as library, green-house, orchid house, algae culture house, rodents care house and microorganism preservation and research (Culture Collection of Universitas Indonesia) are available nearby the department.

The Department of Biology is linked to community by providing experienced experts, sufficient facilities and services such as consultation, training and sample analysis.

#### CAREER OUTLOOK

Graduates of this program have the theoretical and practical skills to pursue future career in ecology conservation, wild life and forestry conservation and microbiology research both in private or governmental sectors.

## CHEMISTRY

Degree : Sarjana Sains (Bachelor of Science)  
Campus Location : Depok Campus  
Lecture Schedule : Morning/Daytime  
Length of Study : 8 Semesters  
Language : Indonesian  
Accreditation : A  
AUN-QA Assessment : 5 (out of 7)

Chemistry studies molecular elements, its composition and its development for the use of human or environmental betterment. Chemistry is highly co-related with other crucial aspects that are influential to human beings such as medical science, pharmaceutical technology and sustainable environment.

The Chemistry Program of Universitas Indonesia allows students to attend practical lectures besides theoretical in-class sessions. The teaching and learning activities employ group work and problem solving in a student-centered learning environment.

The curriculum is designed to prepare students with adequate competence and knowledge in Chemistry. In order to obtain the bachelor degree, students must complete credits of at least 144 which normally take 4 years of study.

#### CAREER OUTLOOK

Graduates of Chemistry will have the opportunity to work in food industries, pharmaceutical laboratories, petrochemical industries, government laboratories, farm development and environment management.

## GEOGRAPHY

Degree : Sarjana Sains (Bachelor of Science)  
Campus Location : Depok Campus  
Lecture Schedule : Morning/Daytime  
Length of Study : 8 Semesters  
Language : Indonesian  
Accreditation : A

Geography is the study of human activities and the related interaction between humans and Earth consisting of its lands, features, inhabitants and phenomena in a spatial perspective which creates a particular pattern.

The Geography Study Program consists of three concentrations: Physical Geography, Regional Planning and Geographical Information System and Remote Sensing.

The department is equipped with three

laboratories to support its academic activities :

- The Geographical Information System and Remote Sensing Laboratory
- The Physical Geography Laboratory
- The Regional Planning Laboratory

The library reserves more than 10,000 books, topography and landscape reference in the form of digital as well as hard copy collection.

### CAREER OUTLOOK

The study of Geography leads to the development of a comprehensive understanding and practical competence in regard to different kinds of phenomena which is applicable in various professional careers, such as regional planning and development, environment management, forestry, mining and energy exploration, transportation, etc.

## MATHEMATICS

Degree : Sarjana Sains (Bachelor of Science)  
Campus Location : Depok Campus  
Lecture Schedule : Morning/Daytime  
Length of Study : 8 Semesters  
Language : Indonesian  
Accreditation : A

The Department of Mathematics sets to lead graduates who have competence to contribute to the development of math in science and technology.

The program is committed to provide a suitable curriculum, academic resources and facilities for the students. The students require a minimum of 144 credits, divided into core and elective courses, in order to obtain a bachelor degree. Computer laboratories and library are available in the campus complex in order to support students' academic activities.

Keeping up-to-date with the current trend of global competency requirements in education, like many other departments at UI, the department has developed some courses with English as the language of instruction. This will also be able to stimulate international student mobility at UI through students exchange and overseas study programs.

### CAREER OUTLOOK

A bachelor degree in mathematics creates possibilities to work in the statistical field in private or government research organizations, banking, financial industries, telecommunication companies and education sectors.

## PHYSICS

Degree : Sarjana Sains (Bachelor of Science)  
Campus Location : Depok Campus  
Lecture Schedule : Morning/Daytime  
Length of Study : 8 Semesters  
Language : Indonesian  
Accreditation : A

Boasting an excellent program, the Department of Physics is a center of physics education and applied physics research. Besides contributing to the education and research activities, many graduates have contributed to the world of global industries by joining many national and multi-national companies.

The Department of Physics has a wide cooperation with a number of industries, international and government affiliations which is aimed to create a mutual partnership that enables both parties to upgrade the competency of physics graduate, develop core knowledge in physics and to actualize academic contribution for community development.

In its bachelor program, the Department of Physics has five concentrations:

- Nuclear and Particles Physics
- Material and Solid Substance Physics
- Electronic Instrumentation Physics
- Geophysics and
- Medical Physics and Biophysics

**Nuclear and Particle** concentration focuses on developing analytical skill with competency in elementary particle and nuclear theory and competency in analyzing and predicting natural disasters. Competency in this area includes Nuclear Technology and Application, Quantum Mechanical and Non Relativistic, Numerical Analysis and Computer Programming.

**Material and Solid Substance** emphasizes on identifying and modifying material engineering with good quality in practical experience and strong basic science comprehension in Competency in Material Nanotechnology, Chemistry Physics, Special Material, Material Engineering and Special Competence according to fields of interest.

**Electronic and Instrumentation** concentration is set to develop competencies in analyzing, duplicating, modifying, developing, designing and making prototype of tools for scientific electronic instrumentation and industry. The area of competency covers Sensor and Application, Measuring and Interfacing, Microprocessor, Computer (Hardware and

Programming), Metrology, Digital and Analog Signal Processing and Instrumentation for Measuring Physics Unit.

**Concentration in Geophysics** is to develop students' competency in geophysics exploration (data acquisition, processing, analysis and data interpretation) that focuses on strengthening aspects of basic concepts of geoscience, numeric computation and direct application in the natural field of petroleum and gas exploration, coal, mineral, environment and disaster mitigation. The competency areas include Geology and Geodesy, Numeric Computation, Geoelectric and Electromagnetic Method, Gravitation Method, Seismic Method, Geophysics Instrumentation, Petroleum Exploration, Geothermal Exploration, Environmental Geophysics.

**Medical Physics and Biophysics** is concentrated to optimize application in the health sector that relates to nuclear radiation, X-ray, ultrasonic, magnetic and laser resonance especially for diagnostic interpretation and oncology therapy. The students will obtain competencies in the field of Radiotherapy, Medical Diagnostic Interpretation, Nuclear Medicine, Radiation Biology and Medical Instrumentation.

### CAREER OUTLOOK

A degree in Physics offers many career prospects in education and academic research, laboratories, meteorology and geophysics agency and air transportation companies.

### GENERAL ASSESSMENTS

Mid Semester Test, Final Semester Test, Project Proposal, Paper Assignment and Undergraduate Thesis.

### SPECIFIC ENTRY REQUIREMENTS

International applicants are expected to meet the language requirements set by the university and to have an understanding of Indonesian Language in order to be admitted to the program since the courses are delivered in the Indonesian language.

## MASTER'S DEGREE

## BIOLOGY

Degree : Magister Sains (Master of Science)  
 Campus Location : Depok Campus  
 Lecture Schedule : Morning/Daytime  
 Length of Study : 4 Semesters (41 credits)  
 Language : Indonesian  
 Accreditation : B

This study aims to nurture researchers, academists, biology experts who are able to create new innovation in conservation biology. To reach its goals, our program works hand in hand with other national and international institutions. Our program has four specialization programs : Conservation Biology, Community Biology, Applied Microbiology and Reproduction Technology.

## CAREER OUTLOOK

This master program graduates pursue higher careers or specialized field in education and academic research, ecology and wildlife conservation, forestry, farm products development, environment management.

## CHEMISTRY

Degree : Magister Sains (Master of Science)  
 Campus Location : Depok Campus  
 Lecture Schedule : Morning/Daytime  
 Length of Study : 4 Semesters (40 credits)  
 Language : Indonesian  
 Accreditation : A

The Master Program of Chemistry aims to nurture chemists with special ability. Also chemists who are advanced at applying chemistry and actively involved in efforts to increase public service. The curriculum is oriented to chemical research and its application.

## CAREER OUTLOOK

This master program graduates pursue higher careers or specialized field in education and academic research, food industries, pharmaceutical companies, petrochemical industries, farm products development and environment management.



## GEOGRAPHY

Degree : Magister Sains (Master of Science)  
Campus Location : Depok Campus  
Lecture Schedule : Morning/Daytime  
Length of Study : 4 Semesters (42 credits)  
Language : Indonesian  
Accreditation : B

The graduates of this program are expected to have the ability to apply and develop spatial analysis for any aspect in regional perspective. This course provides an advanced study in the area of geography and this two-year program have been accredited (A).

### CAREER OUTLOOK

This master program graduates pursue higher careers or specialized field in regional planning and development, environment management, forestry, mining and energy exploration, transportation management, etc.

## MARINE SCIENCE

Degree : Magister Sains (Master of Science)  
Campus Location : Depok Campus  
Lecture Schedule : Morning/Daytime  
Length of Study : 4 Semesters (42 credits)  
Language : Indonesian  
Accreditation : B

In the event of developing ability and competitiveness in marine science, the master program of Marine Science aims to enhance the knowledge and ability of its students in specialization of marine science. The graduate students of this study are expected to be able to conduct research, able to manage and conserve marine resources and have abilities to cooperate in planning and developing marine science.

### CAREER OUTLOOK

This master program graduates pursue higher careers or specialized field in education and academic research, marine ecology conservation and marine resource management.

## MATERIAL SCIENCE

Degree : Magister Sains (Master of Science)  
Campus Location : Depok Campus  
Lecture Schedule : Morning/Daytime  
Length of Study : 4 Semesters (40 credits)  
Language : Indonesian  
Accreditation : B

The graduates of Master of Material Science program are trained to solve problems in material by science methods and also have competence in developing material characteristic which is needed for certain purposes. This program also provides students the knowledge of science and material engineering focused on metal, ceramic, composite, polymer, electric material and also magnetic in order for students to be able to do research and implement them in society. This course also combines education and research as the pillar of innovative research. It offers the following concentrations: Polymer and Composite, Metal and Alloy, Ceramic and Glass and Electric and Magnetic Material.

### CAREER OUTLOOK

This master program graduates pursue higher careers or specialized field in education and academic research, laboratories, manufacturing companies, transportation companies, heavy machinery or construction industries.

## MATHEMATICS

Degree : Magister Sains (Master of Science)  
Campus Location : Depok Campus  
Lecture Schedule : Morning/Daytime  
Length of Study : 3-6 Semesters (42 credits)  
Language : Indonesian

The Department of Mathematics provides this master program as a response of the increasing demand of Mathematicians in manufacture and service industry. The objective of this study is to provide students to have high competence in mathematics, able to conduct research in mathematical field and also to contribute their ability in science, technology and any other fields.

### CAREER OUTLOOK

This master program graduates pursue careers in related work such as statistical field in private or government research organizations, banking, financial industries or education and research sectors.

## PHYSICS

Degree : Magister Sains (Master of Science)  
Campus Location : Salemba Campus  
Lecture Schedule : Morning/Daytime  
Length of Study : 4 Semesters (40 credits)  
Language : Indonesian  
Accreditation : B

The Department of Physics has an objective to provide high quality education for students who wish to deepen their knowledge of physics. We provide five specialization programs :

#### 1. Pure Physics and Applied Physics

This study is tailored to BSc graduates to enhance their physics ability and are looking to pursue a research career in industrial, national research laboratory, or within university. The Master Degree also provide students to pursue career as lecturers for undergraduate program in physics. This study also aims to nurture world-class graduates who are highly innovative and competent in scientific, academic and industrial environments.

#### 2. Medical Physics

Opened in 2002, Medical Physics graduate program serves the nationwide demand of academically-qualified medical physicists. The two-year program is emphasized on learning process on Radiation Therapy, Diagnostic Radiology and Nuclear Medicine in preparation of students' future career as Medical Physicists in hospitals, academician and other related professions.

The curriculum is designed to provide the knowledge and experience needed for careers that involve independent scientific investigation mainly in medical physic. The curriculum is conducted by class meeting, laboratory works, field trip, seminar and research project and using English and Indonesian language as the communication languages.

#### 3. Reservoir Geophysics

The course are planned to provide the knowledge and experience needed to pursue careers that involves independent scientific investigation. Research opportunities allow student to design scientific programs which often include considerable experience at exploration seismology,geology, geophysics and reservoir characterization. The graduates are well prepared for teaching, research

work, the universities lecturer and local government, technical staff and for position in the research institutions, laboratories and oil and gas industry.

The curriculum is designed to provide the knowledge and experience needed for careers that involve independent scientific investigation mainly in reservoir geophysics, which is based on the computing problem. The curriculum is conducted by class meeting, laboratory works, field trip, seminar and research project. The communication language is English and Indonesian language.

#### 4. Geothermal Exploration

UI Master Program in Geothermal Exploration is intended to provide deepening of knowledge and expertise (skill) for the geothermal exploration sector in human resources who are currently or will be working in the geothermal industry or other government institutions. The knowledge given are specialized and applicative, strengthen by the fundamental concept and the practical application of the geothermal exploration on field. The students are given the strengthening of geothermal system concept and the technology used for its exploration, exploitation and utilization, by emphasizing on the exploration field, the stressing of the Master Program of Geothermal Exploration.

The curriculum is emphasized on the understanding of fundamental concept, advanced geoscientific knowledge and skills, strategic exploration management, investment and risk analysis and environmental responsibility. Supported by advanced geoscientific research laboratories: Geothermal Laboratory of UI and Exploration Geophysics Laboratory of UI, that have been developing technology for advanced geothermal exploration (Advanced Geothermal Exploration Technology). UI Master Program in Geothermal Exploration is also supported by BATAN's Laboratory of Geochemistry and Isotope Technology, Geological Resource Center's Laboratory of Geology, as well as the geothermal industry's facilities.

#### 5. Instrumentation Physics

The department is intended to produce graduate students who are advanced in preparing and conducting research in Instrumentation Physics, also students who well prepared as universities lecturer and as experts in Instrumentation who

have ability in quantity and quality control and to expand the diversification of Instrumentation.

#### CAREER OUTLOOK

This master program graduates pursue higher careers or specialized field in education and academic research, laboratories, meteorology and geophysics agency, manufacturing companies and transportation companies.

#### GENERAL ASSESSMENTS

Mid Semester Test, Final Semester Test, Project Proposal, Seminar and Master Thesis.

## DOCTORAL DEGREE

### BIOLOGY

Degree : Doctor  
Campus Location : Depok Campus  
Lecture Schedule : Morning/Daytime/  
Evening  
Length of Study : 6 Semesters (50 credits)  
Language : Indonesian  
Accreditation : C

The doctoral program of biology offers a three-year program which has been developed to prepare students for a research career in biology. The course provides three specialization programs: Community Ecology, Microbiology and Reproduction Technology. It involves lectures, practical work and research project. The students are trained to have a high competence in analyzing and solving problems in biology using an integrated and multidisciplinary approaches.

#### CAREER OUTLOOK

The graduates of this program have a wide range career opportunity in biological field in academic, research institutions or industries, as scientists, healthcare professionals, or as lecturer in universities.

### CHEMISTRY

Degree : Doctor  
Campus Location : Depok Campus  
Lecture Schedule : Morning/Daytime/  
Evening  
Length of Study : 6 Semesters (50 credits)  
Language : Indonesian

The objectives of this course are to equip students who pursue career in academic or industrial research with the required knowledge and skills. The study prepares students to have competence in solving problems in chemistry field, able to invent or be innovator in chemistry, as well as able to develop their knowledge and skills in their field by conducting research for industry such as quality control or assurance, management process and production, research and development, technical representative, as well as service in academic or business. This program offers several specializations such as biological chemistry, non-biological chemistry and biotechnological industry.

#### CAREER OUTLOOK

The graduates of this program have a wide range career opportunity in chemistry field in academic or industries and as lecturer in universities.

### MATERIAL SCIENCE

Degree : Doctor  
Campus Location : Depok Campus  
Lecture Schedule : Morning/Daytime/  
Evening  
Length of Study : 6 Semesters (50 credits)  
Language : Indonesian  
Accreditation : C

The course is aimed at preparing students to solve problems in material science and is equipped with specific training to satisfy demands of material industry. The students are provided to choose one of the three specializations: Metal and Alloy, Polymer and Composite, or Ceramics. The graduates are expected to have competence in conducting research in related field by using general physics concept and finding new material.

#### CAREER OUTLOOK

The graduates of this program have a wide range career opportunity in material field in academic, research institutions or industries, as scientists, or as lecturer in universities.

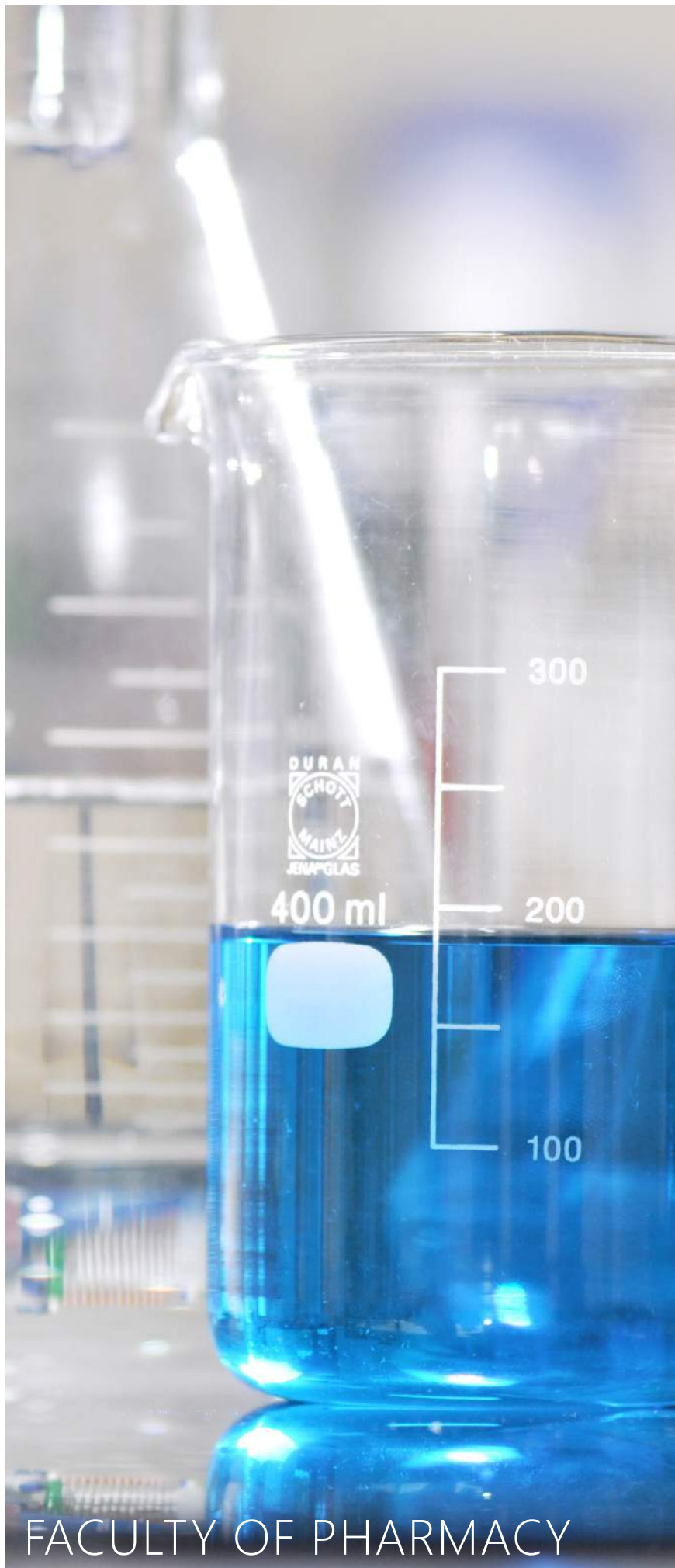
## GENERAL ASSESSMENTS

Lecture, seminar and dissertation.

## SPECIFIC ENTRY REQUIREMENTS

- Graduate from magister program of equivalent discipline  
**Chemistry** : Engineering of Chemistry, Chemistry Science, Pharmacy and Biology.  
**Material Science** : Engineering (Material, Civil, Electro, Machinery, Industry, Metallurgy, Nautical, Mining, Chemistry, Oil); Engineering Physics; Aeronautics; Geology; Geophysics; Physics; Chemistry; Pharmacy; and Biology.
- Have ability in reading and speaking in English





## FACULTY OF PHARMACY

Faculty of Pharmacy is a newly established faculty at Universitas Indonesia in 2012. Before having its own management, Faculty of Pharmacy was under the Faculty of Mathematics and Natural Sciences. Although the organization of the faculty is relatively new, Faculty of Pharmacy is rich of experience in the discipline. It specializes in medicinal treatment and studies of drugs, medicines and their development, the use and the effects mainly from the view point of natural sciences, health sciences as well as social aspects.

The Faculty offers bachelor, master and doctorate degrees. The Faculty also provides professional education in industrial pharmacy for those with a Bachelor or Master's degree.

### FACULTY CONTACT

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## BACHELOR'S DEGREE

## PHARMACY

Degree : Sarjana Sains (Bachelor of Science)  
 Campus Location : Depok Campus  
 Lecture Schedule : Morning/Daytime  
 Length of Study : 8 Semesters  
 Language : Indonesian  
 Accreditation : A

Pharmacy focuses on the knowledge and skills of prescription dispensing used in medical treatment so that medication is used effectively and safely. A pharmacist works closely with hospital paramedics and the community in ensuring that patient treatment is appropriate.

The Bachelor Degree in Pharmacy is administered by the Department of Pharmacy, the Faculty of Mathematics and Natural Sciences. Students have to complete a minimum of 144 credits to obtain a degree. In the final years, students have the option to take courses according to their preferred concentration. The main academic activities consist of in-class lectures, lab practice, seminar and final project.

The discipline is divided into several concentrations as follows:

- Chemical Pharmacy
- Biological Pharmacy/Natural Substance
- Pharmaceutical/Biopharmaceutical
- Pharmacology and Toxicology

## CAREER OUTLOOK

Graduates will have the opportunity to work in hospitals, pharmaceutical industries and public health services.

## GENERAL ASSESSMENTS

Mid Semester Test, Final Semester Test, Project Proposal, Paper Assignment and Undergraduate Thesis.

## SPECIFIC ENTRY REQUIREMENTS

International applicants are expected to meet the language requirements set by the university and to have an understanding of Indonesian Language in order to be admitted to the program since the courses are delivered in the Indonesian language.

## MASTER'S DEGREE

## HERBAL

Degree : Magister Herbal (Master of Herbal)  
 Campus Location : Depok Campus  
 Lecture Schedule : Morning/Daytime  
 Length of Study : 4 Semesters (40-42 credits)  
 Language : Indonesian

This course is intended to nurture human resources who are competent and able to promote Indonesian herbs in international level through their researches. Also, the students have the ability to promote the benefits of Indonesian herb to public for wellness and beauty purposes. Moreover, this program also supports development of knowledge of Indonesian herbs and helps the students produce herb medicine and herb cosmetics based on Good Manufacturing Practice (GMP).

## CAREER OUTLOOK

Graduates will have the opportunity to work in pharmaceutical industries, health and fitness industries, public health services or open their own business in health and beauty services.

## PHARMACY

Degree : Magister Farmasi (Master of Pharmacy)  
 Campus Location : Depok Campus  
 Lecture Schedule : Morning/Daytime  
 Length of Study : 3-4 Semesters (40 credits)  
 Language : Indonesian

This course provides our students with skills in analysis, research and assessment of pharmacy application. This program nurture students who have advanced ability in understanding the core concept and theory of pharmacy and utilize the knowledge to solve any issues including issues in other fields and able to communicate and present their research for public purposes.

## CAREER OUTLOOK

Graduates will have the opportunity to work in hospitals, pharmaceutical industries and public health services.

## GENERAL ASSESSMENTS

Mid Semester Test, Final Semester Test, Project Proposal and Master Thesis.

## DOCTORAL DEGREE

## PHARMACY

Degree : Doctor  
 Campus Location : Depok Campus  
 Lecture Schedule : Morning/Daytime/  
 Evening  
 Length of Study : 6 Semesters (48-50 credits)  
 Language : Indonesian

The Doctoral Program of Pharmacy was established as a response of the increasing demand of expertise in pharmaceutical science and technology. The program covers the basic pharmaceutical sciences among other fields of pharmaceutical (biopharmaceutical, pharmacokinetics and drug delivery), pharmaceutical biotechnology, pharmaceutical natural products, medicinal chemistry and pharmacology - toxicology and applied science field clinical pharmacy.

## CAREER OUTLOOK

The graduates of this program can work as pharmacists, lecturer in universities, as researcher in research institutions or industries, or as manager of Pharmacy industries.

## GENERAL ASSESSMENTS

Lecture, seminar, laboratory research and dissertation.

## SPECIFIC ENTRY REQUIREMENTS

- Have Master degree from equivalent field such as Engineering of Chemistry, Chemistry Science, Chemistry and Biology
- Have ability in reading and speaking in English