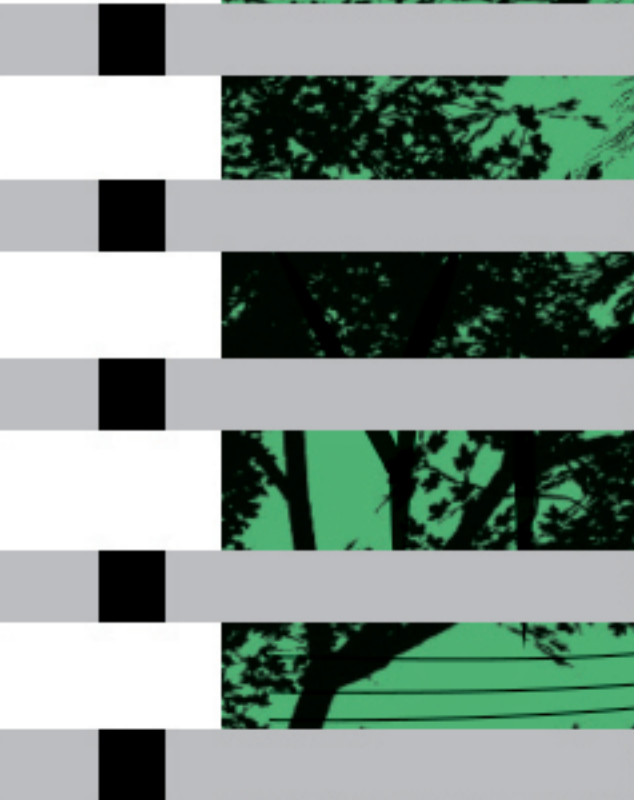




# ACADEMIC GUIDEBOOK

2016 - 2017 edition

## **METALLURGY & MATERIALS ENGINEERING** DEPARTMENT





PROFILE OF FTUI  
AND DEPARTMENTS



The illustration features a modern building with a grid facade on the right side, and a large, leafy tree in the foreground on the left. The building is rendered in a stylized, line-art style with a grid pattern. The tree is dark green and has a full, rounded canopy. The background is a light gray color, and the overall design is clean and modern.

# 1. PROFILE OF FTUI AND DEPARTMENTS

## 1.1. HISTORY OF FTUI

The history of the Faculty of Engineering, Universitas Indonesia (FTUI) began with an offer made from young engineers belonging to the Society of Engineers Indonesia (PII), to the first President of the Republic Indonesia, Bung Karno, for the renovations of the heavily damaged main streets of Jakarta. At that time Jakarta was preparing for the International Sports Event, the GANEFO. This bid was welcomed by President Soekarno. The young engineers were granted permission to start the renovations under the condition that all work must be completed within two weeks period. Headed by Ir. Bratanata, Ir. Roosseno, Ir. Sutami, and Ir. A.R. Soehoed, the project was completed on time.

After successful accomplishment of the street renovation project, these young engineers with their iron will felt that there was more that they could do to serve our country. But what? Then they thought of a brilliant idea: “Why not establish an engineering faculty in Jakarta as an alternative to the one in Bandung? This way those residing in the country’s capital would not need to travel far to Bandung for an engineering education”.

During the ceremonial event of Lenso dancing at the Pembangunan Building (formerly known as Pola Building) to welcome the GANEFO guests of honor, the young engineers brought their idea to President Soekarno to which he responded by inviting them to the Presidential Palace the next day. During the meeting in the Presidential Palace, the President wholeheartedly approved of the idea and even directly appointed Prof. Ir. Rooseno as the first Dean of the Faculty of Engineering. The President also instructed that the new Faculty of Engineering would be part of the University of Indonesia under the leadership of its Rector, dr. Syarif Thayeb.

### The Establishment of Faculty of Engineering UI

Once dr. Syarif Thayeb served as the Minister of Higher Education and Science, he issued Decree No. 76 dated July 17, 1964 regarding the establishment of the Faculty of Engineering. Faculty of Engineering was officially established in Jakarta without any official ceremony or celebration, under the banner of the University of Indonesia as youngest faculty. And so the history of the Faculty of Engineering Universitas Indonesia began with the first three Study Programs with their respective Head of Study Programs: Ir. Sutami as Head of Civil Engineering Study Program, Ir. Ahmad Sayuti as Head of Mechanical Engineering Study Program and Ir. K. Hadinoto as Head of Electrical Engineering Study Program.

The Metallurgy and Architecture Study Programs were opened the following year with their respective Head of Study Programs: Dr. Ing. Purnomosidhi H. and Ir. Sunaryo S.. Ir. Roosseno as Dean was assisted by Ir. Sutami as Vice Dean for Academic Affairs, Ir. Slamet Bratanata as Vice Dean for Administration and Finance and Dr. Ing Purnomosidhi H. as Vice Dean for Student Affairs and Alumni. In its early activities in 1964, Faculty of Engineering UI was supported by 30 lecturers and 11 non-academic employees offering a 32 course subject curriculum. The first class of Faculty of Engineering UI consisted of 199 students. In five and a half years, 18 of them had successfully completed their study and graduated as certified Engineers.

In 1985, the study program Gas Engineering (originally under the Metallurgy Study Program) joined the study program Chemical Engineering (originally under the Mechanical Study Program) and formed the Gas and Petrochemical Engineering Study Program with its first Head of Study Program, Dr. Ir. H. Rachmantio. The Industrial Engineering Study Program, the youngest Study Program in Faculty of Engineering UI, was opened in 1999 with its first Head of Study Program, Ir. M. Dachyar, M.Sc. The term Study Program was later changed to Department and is still used today.

## 1.2. VISION AND MISSION OF FTUI

### FTUI Vision

FTUI as a leading engineering education institution with the ability to compete in the international world.

### FTUI Mission:

- Preparing its graduates to become lifelong learners, to be able to adapt to the working environment, and to acquire decent personalities and leadership qualities.
- To be center of excellence for education and research activities, to serve stakeholders' needs through facilitation of conducive academic environment.
- To be a leading institution with the initiatives that responds to local, national and global societal needs.

## 1.3. UI and FTUI Administration

### UI

#### Rector:

Prof. Dr. Ir. Muhammad Anis. M. Met.

#### Deputy Rector for Academic and Student Affairs:

Prof. Dr. Bambang Wibawarta, S.S., M.A.

#### Deputy Rector for Finance, Logistic and Facilities:

Prof. Dr. Adi Zakaria Afiff

#### Deputy Rector for Research, and Innovation

Prof. Dr. rer. nat Rosari Saleh

#### Deputy Rector for for Human Resources, Development and Cooperation

Dr. Hamid Chalid, S.H., LL.M

### FTUI

#### Dean of Engineering:

Prof. Dr. Ir. Dedi Priadi, DEA

#### Vice Dean I:

Dr. Ir. Muhamad Asvial, M.Eng

#### Vice Dean II:

Dr. Ir. Hendri DS Budiono, M.Eng

#### Associate Dean for Academic and Head of Faculty Administration Center:

Dr. Ir. Wiwik Rahayu, DEA

#### Associate Dean for Research & Community Service

Prof. Dr. Ir. Akhmad Herman Yuwono, M.Phil.Eng

#### Associate Dean for Cooperation, Students Affairs, Alumni & Venture :

Dr. Badrul Munir, ST., M.Eng.Sc

#### Associate Dean for General Affairs & Facilities

Jos Istiyanto, S.T., M.T., Ph.D

#### Head of Academic Quality Assurance Unit

Prof. Ir. Mahmud Sudibandriyo, M.Sc., Ph.D

#### Head of Management System Assurance Development Unit

Dr. Ir. Rahmat Nurcahyo, M.Eng. Sc.

**Departments**

The following are list of Head of Department, and Vice Head of Department:

**Civil Engineering:**

Prof. Ir. Widjojo A. Prakoso, M.Sc., Ph.D  
 Mulia Orientilize, S.T., M.Eng

**Mechanical Engineering:**

Dr.-Ing. Ir. Nasruddin, M.Eng  
 Dr. Ario Sunar Baskoro, ST., MT., M.Eng

**Electrical Engineering:**

Ir. Gunawan Wibisono, M.Sc., Ph.D  
 Dr. Arief Udhiarto, S.T., M.T

**Metallurgy & Materials Engineering:**

Dr. Ir. Sri Harjanto  
 Dr. Deni Ferdian, ST, M.Sc

**Architecture:**

Prof. Yandi Andri Yatmo, S.T., M.Arch., Ph.D  
 Rini Suryantini, S.T., M.Sc

**Chemical Engineering:**

Prof. Ir. Sutrasno Kartohardjono, M.Sc., Ph.D  
 Dr. Ir. Nelson Saksono, M.T.

**Industrial Engineering:**

Dr. Akhmad Hidayatno, S.T., MBT.  
 Dr.-Ing. Amalia Suzianti, ST., M.Sc.

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Prof. Dr. Ir. Tommy Ilyas, M.Eng	Prof. Ir. Triatno Yudo Harjoko, M.Sc., Ph.D
Prof. Dr. Ir. Irwan Katili, DEA	Prof. Dr. Ir. Abimanyu Takdir Alamsyah, MS
Prof. Dr. Ir. I Made Kartika, Dipl. Ing.	Prof. Dr. Ir. Widodo Wahyu P, DEA
Prof. Dr. Ir. Raldi Artono Koestoer	Prof. Dr. Ir. M. Nasikin, M.Eng
Prof. Dr. Ir. Bambang Sugiarto, M.Eng	Prof. Dr. Ir. Anondho W., M.Eng
Prof. Dr. Ir. Yanuar, M.Eng	Prof. Dr. Ir. Setijo Bismo, DEA
Prof. Dr. Ir. Tresna P. Soemardi	Prof. Dr. Ir. Slamet, M.T
Prof. Dr. Ir. Budiarmo, M.Eng	Prof. Dr. Ir. T. Yuri M. Zagloel, M.Eng.Sc
Prof. Dr. Ir. Yulianto S. Nugroho, M.Sc	Prof. Ir. Sutrasno Kartohardjono, M.Sc., Ph.D
Prof. Dr.-Ing. Nandy Putra	Prof. Dr. Ir. Yusuf Latief, MT
Prof. Dr. Ir. Djoko Hartanto, M.Sc	Prof. Dr. Ir. Dedi Priadi, DEA
Prof. Dr. Ir. Dadang Gunawan, M.Eng	Prof. Dr. Ir. Harinaldi, M.Eng
Prof. Dr. Ir. Bagio Budiardjo, M.Sc	Prof. Dr. Ir. Djoko M Hartono, SE., M.Eng
Prof. Dr. Ir. Eko Tjipto Rahardjo, M.Sc	Prof. Dr. Ir. Muhammad Anis, M.Met
Prof. Dr. Ir. Harry Sudibyo	Prof. Ir. Isti Surjandari Prajitno, MT., MA., Ph.D
Prof. Ir. Rinaldy Dalimi, M.Sc., Ph.D	Prof. Dr. Ir. Danardono Agus S, DEA
Prof. Dr. Ir. Rudy Setiabudy, DEA	Prof. Dr. Heri Hermansyah, S.T., M.Eng.
Prof. Dr. Ir. Iwa Garniwa, MK., MT	Prof. Dr. Ir. Sigit P. Hadiwardoyo, DEA
Prof. Dr. Ir. Nji Raden Poespawati,MT	Prof. Dr. Ir. Muhammad Idrus Alhamid

Prof. Dr. Ir. Riri Fitri Sari, M.Sc.MM  
 Prof. Dr. Benyamin Kusumoputro, M.Eng  
 Prof. Dr. Ir. Kalamullah Ramli, M.Eng  
 Prof. Dr. Ir. Eddy S. Siradj, M.Sc  
 Prof. Dr. Ir. Johny Wahyuadi Mudaryoto  
 Prof. Dr. Ir. Anne Zulfia, M.Sc  
 Prof. Dr. Ing. Ir. Misri Gozan, M.Tech.  
 Prof. Ir. Mahmud Sudibandriyo, M.Sc., Ph.D

Prof. Dr. Ir. A. Herman Yuwono, M.Phil.Eng  
 Prof. Yandi A. Yatmo, S.T., M.Arch., Ph.D  
 Prof. Dr. Kemas Ridwan Kurniawan, ST., M.Sc  
 Prof. Dr. Ir. Adi Surjosatyo, M.Eng  
 Prof. Ir. Widjojo Adi Prakoso, M.Sc., Ph.D  
 Prof. Dr. Ir. Winarto, M.Sc  
 Prof. Dr. Ir. Nelson Saksono, MT

#### INTERNATIONAL ADJUNCT PROFESSOR

Prof. Dr. James-Holm Kennedy, University of Hawaii, USA.  
 Prof. Dr.-Ing. Axel Hunger, University of Duisburg, Germany.  
 Prof. Josaphat Tetuko Sri Sumantyo, PhD, Chiba University, Japan, Remote Sensing  
 Prof. Dr. Fumihiko Nishio, Chiba University, Japan, ICT  
 Prof. Chit Chiow (Andy) Tan, School of Mechanical, Manufacturing and Medical Engineering, Queensland University of Technology, Australia, Mechanical Engineering  
 Prof. Kozo Obara, Dept. of Nanostructure and Advanced Materials, Kagoshima University, Japan, Nanomaterial dan Energi  
 Prof. Freddy Y.C. Boey, Nanyang Technological University, Singapore, Nanomaterial dan Biomedical Engineering  
 Prof. Kyoo-Ho Kim, Dr.Eng, School of Material Science and Engineering, Yeungnam University, Korea, Nanomaterial dan Energi  
 Prof. Bernard Cambou, Ecole Centrale de Lyon, France, INRETS (French National Institute for Transport and Safety Engineering), Transport and Safety  
 Prof. Chia-Fen Chi, Dept. of Industrial Engineering, National Taiwan University Science and Technology, Industrial Management  
 Prof. Dr. Katsuhiko Takahashi, Dept. of Artificial Complex Systems Engineering, Hiroshima University, Japan, Artificial Complex System Engineering  
 Prof. Martin Betts, Faculty of Built Environment and Engineering, Queensland University of Technology, Australia.  
 Prof. L. P. Lighthart (Emeritus), Delft University of Technology, Dutch  
 Prof. Dr. Koichi Ito (Printed Antenna, Small Antenna, Medical Application of Antenna, Evaluation of Mutual Influence between Human Body and Electromagnetic Radiations), Chiba University, Japan.  
 Prof. Dr. Uwe Lahl  
 Prof. Tae-Jo. Ko.  
 Prof. Michiharu Tabe, Research Institute of Electronics, Shizuoka University  
 Prof. Masaki Nagatsu, Shizuoka University  
 Prof. Hidenori Mimura, Shizuoka University

#### 1.4. ACADEMIC PROGRAMS AT FTUI

FTUI consists of seven Departments and **twelve Undergraduate Study Programs:**

- |                               |  |
|-------------------------------|--|
| (1) Civil Engineering         | (7) Metallurgy & Materials Engineering |
| (2) Environmental Engineering | (8) Architecture                       |
| (3) Mechanical Engineering    | (9) Interior Architecture              |
| (4) Marine Engineering        | (10) Chemical Engineering              |
| (5) Electrical Engineering    | (11) Bioprocess Engineering            |
| (6) Computer Engineering      | (12) Industrial Engineering            |

**seven Master Programs:**

- |   |                            |
|---|----------------------------|
| (1) Civil Engineering                   | (5) Architecture           |
| (2) Mechanical Engineering              | (6) Chemical Engineering   |
| (3) Electrical Engineering              | (7) Industrial Engineering |
| (4) Metallurgy and Material Engineering |                            |

**and seven Doctoral Programs:**

- |   |                            |
|---|----------------------------|
| (1) Civil Engineering                   | (5) Architecture           |
| (2) Mechanical Engineering              | (6) Chemical Engineering   |
| (3) Electrical Engineering              | (7) Industrial Engineering |
| (4) Metallurgy and Material Engineering |                            |

**and one Professional Program for Architect**

**Accreditation of FTUI Academic Programs**

The National Board of Accreditation for Higher Education (BAN-PT) has awarded the following accreditation level for all study program in the Faculty of Engineering:

for Bachelor Programs:

- |                                       |   |
|---------------------------------------|---|
| Civil Engineering : A                 | Industrial Engineering : A                  |
| Mechanical Engineering : A            | Naval Architecture & Marine Engineering : A |
| Electrical Engineering : A            | Computer Engineering : B                    |
| Metallurgy & Material Engineering : A | Environmental Engineering : B               |
| Architecture : A                      | Architecture Interior : A                   |
| Chemical Engineering : A              | Bioprocess Engineering : A                  |

Accreditation for Master Program is as follows:

- |  |                            |
|--|----------------------------|
| Civil Engineering : A                    | Architecture : A           |
| Mechanical Engineering : A               | Chemical Engineering : A   |
| Electrical Engineering : A               | Industrial Engineering : B |
| Metallurgy and Materials Engineering : A |                            |

Accreditation for Doctoral Program is as follows:

- |  |                            |
|--|----------------------------|
| Civil Engineering : A                    | Chemical Engineering : A   |
| Electrical Engineering : A               | Mechanical Engineering : A |
| Metallurgy and Materials Engineering : A | Architecture : B           |

In 2008 & 2010, the Departments of Mechanical Engineering, Civil Engineering, Electrical Engineering, Metallurgy and Materials Engineering, Architecture and Chemical Engineering have been accredited by the Asean University Network (AUN); and also In 2013 Departments of Industrial Engineering have been accredited by the ASEAN University Network (AUN).

**International Undergraduate Program (Double-Degree & Single Degree)**

Since 1999, Faculty of Engineering has established an international undergraduate program in engineering (double-degree program) with the following renowned Australian higher education institutions: Queensland University of Technology (QUT), Monash University, Curtin University of Technology, The University of Queensland and The University of Sydney. Graduates from this international undergraduate program will be awarded a Bachelor of Engineering degree from our Australian University partner and a Sarjana Teknik degree from Faculty of Engineering UI when they return to FTUI and fulfill certain requirements. The double degree cooperation with QUT involves the study programs Civil Engineering, Mechanical Engineering, Electrical Engineering and Architecture. The double degree cooperation with Monash University involves the study programs

Metallurgy & Material Engineering and Chemical Engineering. The double degree cooperation with Curtin University involves the study programs Chemical Engineering, Architecture, Metallurgy & Material Engineering and Electrical Engineering, with other study programs to follow. The double degree cooperation with the University of Queensland involves the study programs Mechanical Engineering, Electrical Engineering, Chemical Engineering and Metallurgy & Material Engineering. This international undergraduate program provides high quality engineering education in the international level. Since 2011, students will also have a choice to continue their final two years at FTUI as part of the newly opened Single Degree International Program.

Since 2011, students will also have a choice to continue their final two years at FTUI as part of the newly opened Single Degree International Program. The undergraduate international single degree program was launched in 2011 as a result of an increasing demand to provide an international quality education locally. Students in this program are not obligated to continue their last four semester of study at one of our partner universities like their classmates who wishes to pursue a double degree. However, students of single degree program are required to do Study Abroad for a period between one to four semesters at an overseas university. The aims are to widen the international perspective of the students, to have experience to study in an overseas university, to enhance language capability, to enhance cross-cultural adaptability. Study Abroad can be conducted during regular semesters.

#### **Undergraduate Parallel Class Program (Diploma Track) (Extension Program)**

The Undergraduate Extension Program in FTUI was initiated in 1993. At the beginning the program was held for only four Study Programs (Civil, Mechanical, Electrical and Metallurgy Engineering). In 1995 the program was also opened for the Chemical Engineering Study Program (Gas and Petrochemical Engineering) followed by Industrial Engineering in 2002. Starting in 2011, the Undergraduate Extension Program of FTUI was cancelled. However, the faculty still give the opportunity for future FTUI students that are graduates from Diploma Program who wishes to continue their study into the FTUI Undergraduate Program. Students are now able to apply through the Undergraduate Parallel Program (Diploma Track) by using the Credit Transferred System. The number of credits acknowledge will be decided by their respective Departments.

The Undergraduate Parallel Program is a full time program where students are expected to be a full time students in campus. This is due to the schedule set for the program which started from the morning period and well into the afternoon. Currently there are six Study Programs available to choose from: Civil Engineering, Mechanical Engineering, Electrical Engineering, Metallurgy & Material Engineering, Chemical Engineering, Industrial Engineering.



### 1.5.1. DEPARTMENT OF CIVIL ENGINEERING

#### GENERAL

The Civil Engineering Department previously known as Civil Engineering Study Program was established together with the Faculty of Engineering Universitas Indonesia (FTUI) at 17 July 1964. In the initial stage of development, Civil Engineering Department - FTUI offered one study program, Civil Engineering, with two majors, structural engineering and water resources engineering. Following the demand and development of science and technology, it was then expanded with four additional majors, i.e. transportation engineering, geotechnical engineering, sanitary engineering and construction management. With the improvement of human resources and facilities, Postgraduate Program for master degree (S2) and doctoral Degree (S3) were established in 1992 and 2001, respectively. In 2006, the Department established the undergraduate program on Environmental Engineering. Previously, Environmental Engineering is one of the majors in Civil Engineering. There are eight specializations for Master and Doctoral Program in Civil Engineering, structural engineering, geotechnical engineering, water resources management, transportation system & engineering, construction management, environmental engineering, project management and infrastructure management.

To ensure the quality, the Department is regularly accredited by the national accreditation board, BAN-PT (Badan Akreditasi Nasional Pendidikan Tinggi) since 1998. All study programs of Civil Engineering, undergraduate, master and doctor reach the highest grade of "A". The Environmental Engineering Study Program of was nationally accredited in 2010. The under graduate program of Civil Engineering was accredited internationally in 2001 by The Joint Board of Moderators of the Engineering Council consisting of Institution of Structural Engineers (ISE), Institution of Civil Engineers (ICE), and Chartered Institution of Building Service Engineers of the United Kingdom. However, due to changes in their policy, reaccreditation was discontinued. In 2008, undergraduate program of Civil Engineering was assessed by ASEAN University Network - Quality Assurance Program (AUN-QA). In order to maintain the quality in education, AUN-QA reassessment was conducted in 2015.

Civil Engineering is the oldest engineering discipline and encompasses many specialties. Civil engineering can be described as the application of engineering to civil society. It applies the principles of engineering to meet society's fundamental needs for housing, transportation, sanitation, and the other necessities of a modern society. The engineers deal with the design, construction, and maintenance of the physical and naturally built environment, including works like roads, bridges, canals, dams, and buildings, as well as other challenges such as deteriorating infrastructures, complex environmental issues, outdated transportation systems, and natural disasters. Civil engineering education is to prepare students to be master planners, designers, constructors, and managers of various civil engineering works. The graduates can work in all levels: in the public sector from municipal through to national governments, and in the private sector from individual homeowners through to international companies.

Environmental engineering is defined as branch of engineering concerned with the application of scientific and engineering principles for protection of human populations from the effects of adverse environmental factors; protection of environments both local and global from the potentially deleterious effects of natural and human activities; and improvement of environmental quality. Tasks of environmental engineers include evaluation of environmental quality of water, air and soils by developing strategies and methods, design of facilities or programs, evaluation of results and assessment of the economics and efficiency of processes. The Environmental Engineering Study Program provide graduates with professional and competence in planning, designing, constructing and managing environmental infrastructure for: drinking water treatment, liquid and solid waste management, drainage, environmental sanitation, water resources, air pollution, pollution prevention & environmental impact assessment.

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**VISION and MISSIONS****VISION**

“To become a center of knowledge and technology in Civil Engineering and Environmental Engineering and to play an important role in global market”

**MISSIONS**

- To produce graduates who have a mastery of fundamental knowledge and meet the international standard and have environmental conscious.
- To contribute to betterment of society through quality research and professional community services in civil engineering & environmental engineering with sustainability considerations.
- To prepare graduates for leadership roles, having effective communication skills and professional ethics.

**STAFFS OF THE DEPARTMENT OF CIVIL ENGINEERING****Head of Department:**

Prof. Ir. Widjojo Adi Prakoso, M.Sc., Ph.D

**Vice Head of Department:**

Mulia Orientilize, ST, MEng

**Head of Civil Engineering Study Program:**

Prof. Ir. Widjojo Adi Prakoso, M.Sc., Ph.D

**Head of Environmental Engineering Study Program:**

Dr. Ir. Setyo Sarwanto Moersidik, DEA

**Head of Laboratory****Head of Structure and Materials Laboratory:**

Dr. Ir. Elly Tjahjono S, DEA

**Head of Soil Mechanics Laboratory:**

Erly Bahsan, ST, Mkomp

**Head of Hydraulics, Hydrology and River Laboratory:**

Ir. Siti Murniningsih, MS

**Head of Transportation Laboratory:**

Dr. Ir. Tri Tjahjono

**Head of Mapping and Surveying Laboratory:**

Ir. Alan Marino, MSc

**Head of Sanitation & Environment Laboratory:**

Ir. Gabriel S. Boedi Andari, M.Eng., Ph.D

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- Prof. Dr. Ir. Sutanto Soehodho, M.Eng.**, tanto@eng.ui.ac.id (Ir, UI, M.Eng, Dr, Tokyo University; Prof. UI) Transportation
- Prof. Dr. Ir. Yusuf Latief, MT.**, latief73@eng.ui.ac.id (Ir, UI; MT, Dr, UI; Prof. UI) Project Management
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- Prof. Dr. Ir. Sigit Pranowo Hadiwardoyo, DEA.**, sigit@eng.ui.ac.id (Ir, UI; DEA, Ecole Centrale de Lyon; Dr, Ecole Centrale Paris; Prof. UI) Transportation
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**Setyo Sarwanto Moersidik**, ssarwanto@eng.ui.ac.id (Ir, ITB; DEA, Dr, Universite'de Montpellier II) Environmental  
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## 1.5.2. DEPARTMENT OF MECHANICAL ENGINEERING

### GENERAL

The Department of Mechanical Engineering, previously known as Mechanical Engineering Study Program. The department was established together with the launch of the faculty of engineering Universitas Indonesia in November 27, 1964 at Salemba, Jakarta. Nowadays there are 2 study programs within the department, which are: Mechanical Engineering Study Program and Marine Engineering Study Program. The mechanical engineering study program provides the knowledge which focused into Energy Conversion, Product Design, Manufacturing Process and also the basic of Industrial operational and managerial. The Marine Engineering study program provide the education which focused into Ship design, Ship manufacturing process, ship maintenance, ship machinery installation and also the rules and laws of marine. The graduates of the mechanical engineering have worked in several areas such as automotive industry, oil and gas industry, heavy duty engine, educational institution, research institution and other industries. The department of mechanical engineering organized several programs, which are: Bachelor Degree (Regular, Parallel, and International class) Master Degree and Doctoral Degree. Since August 2007, the department of mechanical engineering received the ISO 9001: 2000 for quality management system in Mechanical Engineering Study Program. In 2011, The Department of Mechanical Engineering once again received the ISO 9001: 1008 for quality management system. Certification by international agencies is one of management's commitments in quality management, to ensure and enhance academic quality and stakeholder satisfaction. The mechanical engineering study program also received the highest academic accreditation point according to the National Accreditation Board in 2005. In 2008, the Department of Mechanical Engineering has also gained international recognition in the form of accreditation of the ASEAN University Network (AUN). This again shows the commitment the Department of Mechanical Engineering to develop international education and excel in their fields, as stated by the firm through the vision, mission and goals.

Developing nations are very dependent of human resource development. Resource is people who set the direction, goals, implement and develop the nation's life. With good human resources are expected to achieve the life of prosperous and affluent nations. Therefore, the developments of human resources become the key of national development. Higher education in Indonesia is part of the National Education System which aims to develop the intellectual life of the nation through the development of human resources to carry out three main activities of the so-called "Tridharma Universities", namely :

1. Hold a higher level education
2. Conduct the scientific research
3. Perform the Community service

In order to develop human resources for the life of the nation, the Department of Mechanical Engineering has set a goal of three main activities is to be a reference to any academic activity. In education, has a goal to produce graduates who are able to analyze and synthesize the characteristics of mechanical systems, designing and planning systems and mechanical equipment as well as managing the production installation, and be able to analyze and solve any scientific problem, work together in teams, and develop themselves and their knowledge, with a lofty intellectual attitude, pattern of systematic thinking, logical and integrated. In the field of research, Department of Mechanical Engineering has a goal to contribute and play a role in the development of mechanical science and technology and a continuous intake of the educational process. While the field of devotion and service to the community, aims to provide ideas and direct involvement in quality improvement and enhancement of community and industry.

To answer the demand of graduate academic programs that have the character of leadership and excellence in academic and professionalism in the field of Mechanical Engineering, both at the level of Bachelor, Master, or PhD, the Department of Mechanical Engineering, developed the design of competency-based academic curriculum is implemented through the student centered teaching

activity(student centered learning). According to the degree, in the curriculum design the research activity become the major aspect in the Doctoral Degree.

In the 2012 curriculum design, the integration of the design between bachelor degree, master degree and doctoral degree curriculum has been pursued, so it is possible for a student with an excellent academic record to take courses from a higher degree (Master and Doctoral) by using the credit transfer regulation through the Fast Track Program.

A more detailed explanation of each of the courses organized by The Mechanical Engineering and Marine Engineering Study Program, the description of the main academic competence, and other supporters of the graduates of each program of study, are given in the following section.

### Contact

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## VISION and MISSION

### Vision

“Become the center of the excellent research and education service in Mechanical Engineering”

### Mission

“To conduct research and research-based education for the development of science and technology in the field of mechanical engineering, and to conduct research and education and use it to improve the quality of life and humanity”

### Head of Department :

Dr.-Ing. Ir. Nasruddin, M.Eng

### Vice Head of Department:

Dr. Ario Sunar Baskoro, ST., MT., M.Eng

### Head of Mechanical Engineering Study Program:

Dr-Ing.Ir. Nasruddin, MEng

### Head of Naval Architecture and Marine Engineering Study Program:

Dr. Agus S. Pamitran, ST, MEng

### Assistant to Vice Head for Academic Affairs:

Dr.Eng. Radon Dhelika, B.Eng, M.Eng

### Assistant to Vice Head for Non-Academic Affairs:

Dr. Agung Shamsuddin Saragih, S.T, MS.Eng

### Cooperation Relationship Coordinator:

Dr. Yudan Whulanza, ST., MSc.

### Venture Coordinator / Director of P2M:

Ardiyansyah, S.T, M.Eng, PhD

### Head of Laboratory

#### Head of Mechanical and Biomechanic Design Laboratory :

Dr. Ir. Wahyu Nirbito, MSME.

#### Head of Mechanical Technology Laboratory:

Prof. Dr. Ir. Danardono A.S., DEA, PE

**Head of Thermodynamics Laboratory:**

Prof. Dr. Ir. Yulianto S. Nugroho, MSc, PhD.

**Head of Heat Transfer Laboratory:**

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**Head of Fluid Mechanics Laboratory:**

Dr. Ir. Warjito, M.Eng.

**Head of Manufacture and Otomatization Laboratory:**

Dr. Ario Sunar Baskoro, ST., MT., M.Eng

**Head of Air-conditioning Engineering Laboratory:**

Prof. Dr. Ir. M. Idrus Alhamid

**Head of Ship Design Laboratory:**

Prof. Dr. Ir. Yanuar, M.Eng. MSc.

**Head of Research Cluster- Kelompok Ilmu (KI)**

**Head of KI. Energy Conversion:**

Prof. Dr. Ir. M. Idrus Alhamid

**Head of KI. Design, Manufacture and Automation:**

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## 1.5.2. DEPARTMENT OF ELECTRICAL ENGINEERING

### GENERAL

The Department of Electrical Engineering, Faculty of Engineering, Universitas Indonesia was established at the same time with the establishment of Faculty of Engineering on July 17th, 1964. Even though the classes had been started since October 17th, 1964. At the beginning of the establishment, the Department of Electrical Engineering was named as “Jurusan Listrik” consisted of two fields of studies: Electrical Power and Electronics & Telecommunication. Since 1984, “Jurusan Listrik” has been changed to “Jurusan Elektro”, which has been named again as The Department of Electrical Engineering in 2004. Initially there are five streams available in this department, namely: (1) Electrical Power Engineering, (2) Electronics Engineering, (3) Telecommunication Engineering, (4) Control Engineering, (5) Computer Engineering. Since 2006, computer engineering stream became a new study program: Computer Engineering Study Program (CESP) in the Department. In 2016, a new stream namely Biomedical Engineering is officially established.

### THE OBJECTIVE OF EDUCATION

The objective of the Electrical Engineering education is to produce graduate who is able to propose solutions to electrical engineering related problems based on professional ethics.

### VISION AND MISSION

The department has the vision to become a high standard of excellence in education and research in the field of electrical engineering. In order to achieve such vision, the department has defined its mission to produce Electrical Engineering graduates who are able to compete beyond the national labor market. The graduates will be capable to respond to the vast growing engineering technology development though the support of excellent educational process, excellent management and organization, international standard of competence of the teaching staff and international reputation in specific research activities.

### THE TARGETS

#### Bachelor of Electrical Engineering

1. Able to design of the hardware.
2. Able to design of the software.
3. Able to handle general issues and specific in electrical engineering.
4. Able to apply the basic principles of mathematics, physics, and statistics in solving electrical engineering.
5. Capable of critical thinking, creative, and innovative and have the intellectual curiosity to solve problems at the level of the individual and the group.
6. Able to identify varieties of entrepreneurial efforts that are characterized by innovation and self-reliance based on ethics.
7. Able to use the language both spoken and written in the Bahasa Indonesia and English for academic or non-academic activities.
8. Able to provide alternative solutions to problems that arise in the environment, society, nation, and country.
9. Able to utilize information communication technology (ICT).

#### Bachelor of Computer Engineering

1. Able to design system, component, and process based on needs in a variety of areas of life.
2. Able to design information networks.
3. Able to design a computer-based system.
4. Able to make algorithm and implement it into programming.
5. Able to apply the basic principles of mathematics, physics, and statistics in solving computer engineering.
6. Able to use the language both spoken and written in the Bahasa Indonesia and English for

academic or non-academic activities.

7. Have integrity and are capable of critical thinking, creative, and innovative and have the intellectual curiosity to solve problems at the level of the individual and the group.
8. Able to utilize information technology communication.
9. Able to provide alternative solutions to problems that arise in the environment, society, nation, and country.
10. Able to identify varieties of entrepreneurial efforts that are characterized by innovation and self-reliance based on ethics.

**Master of Electrical Engineering**

1. Able to model electrical engineering system into mathematical equations
2. Able to formulate the problem solving in electrical engineering with the proper research methods
3. Able to produce innovative independent scientific work
4. Able to apply concepts of professional management in the field of electrical engineering

**ELECTRICAL ENGINEERING STAFFS**

**Head of Department:**

Ir. Gunawan Wibisono, M.Sc., Ph.D

**Head of Electrical Engineering Study Program**

Ir. Gunawan Wibisono, M.Sc., Ph.D

**Head of Computer Engineering Study Program**

Dr. Muhammad Salman, ST., MIT.

**Vice Head of Department:**

Dr.Eng. Arief Udhiarto, S.T., M.T.

**HEAD OF LABORATORY**

**Head of High Voltage and Electrical Measurement Laboratory:**

Ir. Amien Rahardjo, MT.

**Head of Electrical Power Conversion Laboratory:**

Ir. I Made Ardita, MT.

**Head of Electrical Power System Laboratory:**

Prof. Dr. Ir. Iwa Garniwa M. K., M.T.

**Head of Electronics Laboratory:**

Dr. Agus Santoso Tamsir, MT

**Head of Control Laboratory:**

Dr. Ir. Feri Yusivar, M.Eng.

**Head of Digital Laboratory:**

Prima Dewi Purnamasari, ST., MT., M.Sc.

**Head of Telecommunication Laboratory:**

Dr. Fitri Yuli Zulkifli, M.Sc

**Head of Optoelectronics Laboratory:**

Dr. Ir. Retno Wigajatri, MT.

**Head of Computer Networks Laboratory:**

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- Prof. Dr.-Ing. Kalamullah Ramli, M.Eng.**, k.ramli@ee.ui.ac.id (Ir., Universitas Indonesia, 1993; M.Eng., Univ. of Wollongong, Australia, 1997; Dr.-Ing, Univ. Duisburg-Essen, Germany, 2003, Prof., UI, 2009) Embedded systems.
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### 1.5.4. DEPARTMENT OF METALLURGY AND MATERIALS ENGINEERING

#### GENERAL

Department of Metallurgy was originally established as a study program under Faculty of Engineering, Universitas Indonesia in 1965. Due to the lack of qualified lecturers and infrastructure, the first academic activity was only attended by 25 students. For almost 6 years since 1969, the department had stopped accepting new students and focusing the activity to the existing students. In 1975, the department began to accept students again, and in the same year produced the first 7 graduates. Ever since, the department kept continuing and developing its academic activities.

As the science and technology progresses, especially for the engineering materials-based industries, also considering the availability of resources within the department, Department of Metallurgy consolidated its resources and studied the need to add “materials” to the name. Following the idea, on November 5th 2002, Rector of Universitas Indonesia then decreed Department of Metallurgy and Materials Engineering as one of the departments within the Faculty of Engineering.

The curriculum in Metallurgy and Materials Engineering is structured to address problems associated with the metallurgy and design of materials and materials processing to meet the specific needs for a variety of industries. Emphasis is on the basic sciences and principles of engineering with applications of these principles to metallurgy and materials behaviors. The students must obtain a broad foundation in chemistry, physics, and mathematics, which is applied in engineering courses. Within metallurgy and materials engineering courses, students obtain a foundation in the major areas of metallurgy and materials science and to the major classes of engineering materials, which is applied in courses in materials properties and selection, computational methods and in capstone design course. Students gain in-depth experience in another engineering discipline through coordinated technical elective sequences.

In 2016, the department has totally graduated almost 2300 graduates with a degree in bachelor of engineering, 163 graduates with a degree in master of engineering, and 25 graduates with a doctoral degree. At the beginning of first semester of 2016/2017, the department has actively 479 undergraduate students from regular and parallel program, 57 students from undergraduate international program, 71 master students, and 13 doctoral students. Considering the high demand to produce qualified graduates and following current trends toward the global competition, Department of Metallurgy and Materials Engineering is committed to continuously improve its academic activities including teaching and learning process as well as research activities. As a part of national education system, which has the objective to develop the intellectual life of the nation through human resources development by conducting three main activities known as tridharma (“three duties”), the department is also committed to carry out higher level educations, to conduct scientific research, and to provide community services.

During its development stage, the Department of Metallurgy and Materials Engineering has achieved several milestones, such as:

- Grade A Accreditation for Undergraduate Program from National Accreditation Board, Ministry of National Education (Year 2013 and 2018).
- Establishment of master (1995) and doctoral (2008) programs.
- Grade A Accreditation for Master Program from National Accreditation Board, Ministry of National Education (Year 2014 - 2019)
- Grade A Accreditation for Doctoral Program from National Accreditation Board, Ministry of National Education (Year 2012 - 2017)
- Establishment of “Dual-degree” International Program with Monash University (2003).
- Grant awards from the Government of Republic Indonesia for:
  - Internal Improvement for non-metallic field competence - PHK-A4 (2004)
  - Improvement for external and regional competence - PHK-A2 (2004-2006)
  - Internationalization of academic and research activities in information technol-



ogy, energy and nonmaterial - PHKI (2010-2013)

- Establishment of Center for Materials Processings and Failure Analysis (CMPFA), a venture unit to support the materials engineering community and industry (2001).
- Intensive academic and research collaborations with international institutions, such as Monash University (Australia), Kagoshima University (Japan), Nanyang Technological University (Singapore), Yeungnam University and KITECH (Korea) (since 2006).
- Materials Testing Laboratory was accredited ISO 17025 (2011)

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**VISION AND MISSION OF THE DEPARTMENT OF METALLURGY & MATERIALS ENGINEERING**

**Vision**

In line with the vision and mission of Universitas Indonesia and Faculty of Engineering, the vision of the Department of Metallurgy and Materials Engineering is “As a research-based center of excellence, as well as referral center and solution provider for problem in the field of metallurgy and material engineering both nationally and globally.”

**Mission**

To achieve such a vision, Department of Metallurgy and Materials Engineering put its mission:

- Providing broad access to education and research for the public and industry society
- Producing high quality graduates with strong academic background and comprehensive skills in process technology, material engineering and design, and are capable of playing active and dynamic role in national, regional and international communities
- Conducting quality Tridharma (three duties) relevant to the national and global challenges
- Creating conducive academic environment to support the vision of Department of Metallurgy and Materials Engineering

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**Head of Physical Metallurgy Laboratory:**

Prof. Dr. Ir. Winarto, M.Sc (Eng)

**Head of Mechanical Metallurgy Laboratory:**

Ir. Bambang Priyono, MT

**Head of Processing Metallurgy Laboratory:**

Dr. Ir. Dwi Marta Nurjaya, MT

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## STUDY PROGRAM

Department of Metallurgy & Materials Engineering manages the course program as follows:

- Under-graduate Program (S1 Program) of Metallurgy & Materials Engineering.
- Magister Program (S2 Program) of Metallurgy & Materials Engineering
- Doctoral Program (S3 Program) of Metallurgy & Materials Engineering

### 1.5.5. DEPARTMENT OF ARCHITECTURE

#### GENERAL

Department of Architecture at the Universitas Indonesia (formerly known as Architectural Engineering Major) was established in 1965 under the UI Faculty of Engineering (FTUI) in Jakarta (established a year earlier through Presidential Decree No. 76 dated July 17, 1964). In the early days, education at the FTUI Architectural Engineering was done through a system of per-level or per-year full professional education. The average completion time was 7 years with an Engineer (Ir.) degree. Then in 1978, the Semester Credit System (SKS) went into effect with a minimum number of acquired semester credit units of 160 credits. The average duration of the study was five years, and the title was still Engineer (professional education). Since 1996, a four-year bachelor's education program was implemented with a total of 144 credits, producing an academic degree Bachelor of Engineering (ST). In the same year, after 31 years of existence, Architecture Program of Study at UI received its decree by the Directorate General for Higher Education No. 215/DIKTI/ KEP/1996 dated July 11, 1996.

In 2000, Department of Architecture streamlined the 1996 curriculum by publishing the 2000 Curriculum along with the application of problem-based learning method, collaborative and student-centered learning. The 2000 Curriculum stated clearly, that the direction for bachelor's architecture education is pre-professional.. In the same year, Master of Architecture program was established with 2 streams , namely Architectural Design and Urban Design. Over the years, the master's program has grown into 6 streams, in addition to the two already mentioned earlier, the specialization program of Urban Housing and Settlements, Real Estate, History and Theories of Architecture and Urbanism and Building Technology and Sustainability were established. At this time, through the new curriculum (2012 Curriculum), the six specializations were streamlined into three which are:

- Creative process stream: Architectural Design, Urban Design, Property Development
- Humanities stream: History and Theories of Architecture, Urban Housing and Settlement
- Technology and sustainability stream: Architecture and Technology

In 2004, Architectural Engineering Major changed to Department of Architecture. The degree for its graduates was also altered from Bachelor of Engineering (ST) to Bachelor of Architecture (S.Ars) for the bachelor graduates and Master of Architecture (M.Ars) for the master's. From 2000 until 2012, the Department of Architecture went through several changes in Curriculum and thus the curriculum is integrated and emphasize several points:

1. Flexibility in following the development of science and technology.
2. Curriculum that responds in fulfilling the demands of professionals within national, regional and also international level.
3. Referring to the National Education System based on Competence. The core of the curriculum is in respect to the profession of architect in collaboration with IAI, and refers to UIA as the international standards..

In 2008 a new study program, Interior Architecture Undergraduate Program is opened), which emphasizes the of interiority aspects of the design in architecture. The opening of this Interior Architecture study program allows the opportunity to explore and develop the field of interior architecture in Indonesia.

In 2009 a PhD program and a one-year program of Professional Program of Architect (PPAR) are set. Ph.D program is intended to strengthen the Department of Architecture as a leading architectural research-based institution. PhD student's research is focused on two areas: major research areas (research based on architectural issues) and minor research area (related to specialized area of study) in which PhD program students have the opportunity to take courses outside the discipline of architectural discipline to specifically support the knowledge, thoughts, and methods of its major. The learning process is conducted through the exploration of the width and depth aspects of knowledge about the studied issues. Meanwhile, for PPAR, the education is carried in a year to

complete graduates with the actuality of professional architecture practice. Graduates of PPAR are also allowed to transfer the credit in UI to continue for a master degree in architecture.

Department of Architecture has also commenced an International Class (KKI) of undergraduate degree in architecture, with single degree program (only one semester abroad), or a double degree program (4 semesters in UI and the rest abroad). This program is in collaboration with leading universities in the world such as the Queensland University of Technology (QUT), Curtin University (Australia), University of Florida and Politecnico di Milano (Italy). In addition, S1 students who have excellent academic achievements are able to attain a Fast-Track program (4 years bachelor + 1 year master), a total of 5 years, to accomplish a Master Degree in Architecture..

The Department of Architecture UI has an A accreditation from the Higher Education BAN, Indonesian Ministry of Research and Higher Education.). The Undergraduate Program Department of Architecture program has been also assessed by the ASEAN University Network (AUN) in 2010. For more profiles of FTUI Department of Architecture can be viewed at the website: <http://architecture.ui.ac.id>.

## VISION and MISION

### VISION

Toward an excellent architectural education institution with regional and international recognition.

### MISSION

To deliver excellent architectural education that leads the development of architectural knowledge and promotes meaningful application of knowledge for the society.

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**Herlily**

(Ir. Architecture Universitas Indonesia; M.Urb.Des, University of Sydney, Australia; Ph.D Candidate, UC Berkeley, USA) Architectural Design, Urban Design Theory, Studies of Architecture and Urbanism in Developing Country, Urban Studies.

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**Kristanti Paramita**

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**Sukisno**

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**Widyarko**

(S.Ars, Arhitecture Universitas Indonesia; M.Ars, Universitas Indonesia).Building Technology and Materials

### 1.5.6. DEPARTMENT OF CHEMICAL ENGINEERING

#### GENERAL

The main mission of the Chemical Engineering Department is to provide the highest quality education so that graduates have the necessary knowledge, skills, and experience conducting research with current topics in the field of chemical engineering and biochemical engineering. Starting from the opening of the Gas Engineering Program in 1981, Chemical Engineering Department at UI is now one of the leading chemical engineering departments in Indonesia having excellent accreditation from National Accreditation Board of Indonesia (BAN) and the ASEAN University Network (AUN). Chemical Engineering Department has two study programs, Chemical Engineering (PSTK) and Bioprocess Technology (PSTB), 30 permanent academic staff and about 800 undergraduate and graduate students. In order to enhance the role of the department in the era of biotechnology and life sciences, PSTB was opened in 2008.

Chemical engineering department offers five academic programs: undergraduate program (regular, parallel, international), master program (regular and gas management at Salemba campus), and doctoral program. The chemical engineering department has been adhering to competency-based principles starting in curriculum 2000 up to the recently updated curriculum 2012. The present graduate competencies are based on those recommended by ABET and the Bologna Process and on feedbacks from graduates and industry representatives, aiming at producing graduates who are educated and able to contribute effectively to their communities wherever they choose to live and work. The chemical engineering department is conducting international classes in collaboration with three Australian universities: Monash University, Curtin University and University of Queensland. Students in this international class spend their first four semesters at UI, and spend the subsequent four semesters in Australia. At the end of their study, students will get a Sarjana Teknik degree from UI and a Bachelor of Engineering degree from the partner university. Since 2011, international program students may choose to enroll in a single-degree program at UI following a curriculum that is equivalent to the regular undergraduate curriculum. The department also has established double degree master programs with National Taiwan University of Science and Technology (NTUST) and Curtin University. In this double degree programs, students spend their first year at UI and the second year at NTUST or Curtin University. At the completion of their studies, students will be awarded a Master of Engineering degree from NTUST or Curtin University.

The updated curriculum is now more streamlined and integrated allowing students to take elective courses previously only available in a study program (PSTK or PSTB) or available for a certain level (undergraduate or graduate). It means that students could choose courses that are more suitable to their interest. For those who qualify, there is a fast-track program that allows undergraduate students to obtain both bachelor and master degrees in ten semesters instead of in twelve semesters. Chemical engineering master's program has also prepared a special curriculum for those without an educational background not in chemical engineering. By adopting this special curriculum, applicants with a non-chemical engineering degree are recommended to take the chemical engineering undergraduate core courses to master the fundamentals of chemical engineering before taking more advanced core graduate courses. Graduates of doctoral programs are expected to contribute to the development of science by conducting independent research, usually under supervision of a qualified professor.

Chemical engineering department as one of the departments in the Faculty of Engineering, University of Indonesia has taken part in a research effort with the theme "Sustainable chemical and bioengineering for energy and product development". This research theme is supported by four research groups: chemical and natural product design, sustainable energy, industrial bioprocess technology, and process intensification. Research activities conducted at the Chemical engineering department has received a lot of government funding to support the research activities of students.

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**VISION, MISI AND OBJECTIVES OF CHEMICAL ENGINEERING DEPARTMENT - FTUI**

**Vision**

*“To become a world class Chemical Engineering Department as center of excellence for education and research in chemical engineering.”*

**Mision**

The Department seeks to provide the best quality of undergraduate and postgraduate education. The Department will provide a broad-based education and design experience, enabling students to address chemical engineering problems. Furthermore, the Department will provide students with fundamental elements to develop in the profession in response to rapidly changing technology and societal needs and expectations, and, will also develop important soft skills such as problem solving, communication, and group skills.

**STAFF OF THE DEPARTMENT OF CHEMICAL ENGINEERING**

**Head of Department**

Prof. Ir. Sutrasno Kartohardjono, M.Sc, PhD

**Vice Head of Department**

Prof. Dr. Ir. Nelson Saksono, MT

**Head of Chemical Engineering Study Program :**

Prof. Ir. Sutrasno Kartohardjono, M.Sc, PhD

**Head of Bioprocess Engineering Study Program**

Dr. Dianursanti, ST., MT

**HEAD OF LABORATORY**

**Head of Chemical and Natural Product Design Laboratory**

Prof. Dr. Ir. Mohammad Nasikin, M.Eng

**Head of Chemical Process Intensification Laboratory**

Prof. Dr. Ir. Setijo Bismo, DEA

**Head of Sustainable Energy Laboratory**

Dr. Ir. Asep Handaya Saputra, M.Eng

**Head of Bioprocess Engineering Laboratory**

Dr. Tania Surya U, ST., MT

**Head of Basic Chemical Process Laboratory**

Ir. Rita Arbianti, M.Si

**Head of Chemical Process System Laboratory**

Dr.rer.nat. Ir. Yuswan Muharam, MT

**Head of Basic Process and Operation Laboratory**

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**Tania Surya Utami** nana@che.ui.ac.id (Ir, UI; MT, UI; Dr, UI): Bioprocess.

**Yuliusman** usman@che.ui.ac.id (Ir, UI; M.Eng, UTM, Malaysia; Dr, UI): Liquid-liquid extraction, gas and pollutant adsorption, and purification of smoke.

**Yuswan Muharam** muharam@che.ui.ac.id (Ir, UI; MT, UI; Dr.rer.nat, University of Heidelberg, Germany): Modeling and simulation of chemical process.

#### PART-TIME FACULTY

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**Tilani Hamid** tilanihs@che.ui.ac.id (Ir, ITB; M.Si, UI): Material and corrosion science.

**Elsa K. Mulia** elsa\_krisanti@yahoo.com (S.Si, ITB; PhD, Colorado School of Mines, USA): Applied chemistry, biomass conversion, teaching-learning methods.

### 1.5.7. DEPARTMENT OF INDUSTRIAL ENGINEERING

#### GENERAL

Industrial Engineering Education is an answer to a growing need of industrial engineers who have the capabilities of managing production or operations process efficiently and effectively to achieve excellence. Industrial Engineers should be one of the backbones for transforming our national industry to be more competitive and contribute to our nation's welfare. The scope of the term industry is for both service and manufacturing industry.

Industrial Engineering Program was actually formed in the mid 1970s as a part of Mechanical Engineering Department, due to the market needs for a specialized mechanical engineers which defines the current definition of industrial engineers. In 1998, based on Decree by Higher Education Director No 207/DIKTI/Kep/1998 dated June 30 1998, the Industrial Engineering Department was born. With the new status as department, the program had more autonomy and opportunity to enhance the Industrial Engineering Discipline in Indonesia.

After 10 years as an independent Department, Industrial Engineering has been recognized by the national public and industry as one of the forefronts industrial engineering education in Indonesia. This is shown by the high demand and acceptability of our graduates. Today, our graduates have been accepted not only in the manufacturing industry but also service industry such as governments, hospital, financial service, consulting, information technology and many others. In the manufacturing area, we have graduates in charge of production or operations management, human resource development, maintenance, inventory and logistics, and many more.

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#### VISION and MISSION

##### Vision

“ To be a premier industrial engineering higher education institution with good national and international reputation in providing high quality graduates and researches.”

##### Mission

- Establishing education to provide high quality graduates accepted by national and international industry
- Fostering researches to answer the needs of national industry
- Harnessing the knowledge of industrial engineering for the welfare of the society

#### STAFF OF THE DEPARTMENT OF INDUSTRIAL ENGINEERING

##### Head of Department:

Dr. Akhmad Hidayatno, ST, MBT

##### Vice Head of Department:

Dr.-Ing. Amalia Suzianti, ST., M.Sc.

##### Head of Laboratory

##### Head of Manufacturing System Laboratory:

Prof. Dr. Ir. T. Yuri M. Zagloel, MEngSc

##### Head of Human Factors Laboratory:

Ir. Boy Nurtjahyo, MSIE

**Head of System Engineering Modeling and Simulation Laboratory:**

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**Head of Statistics and Quality Engineering Laboratory:**

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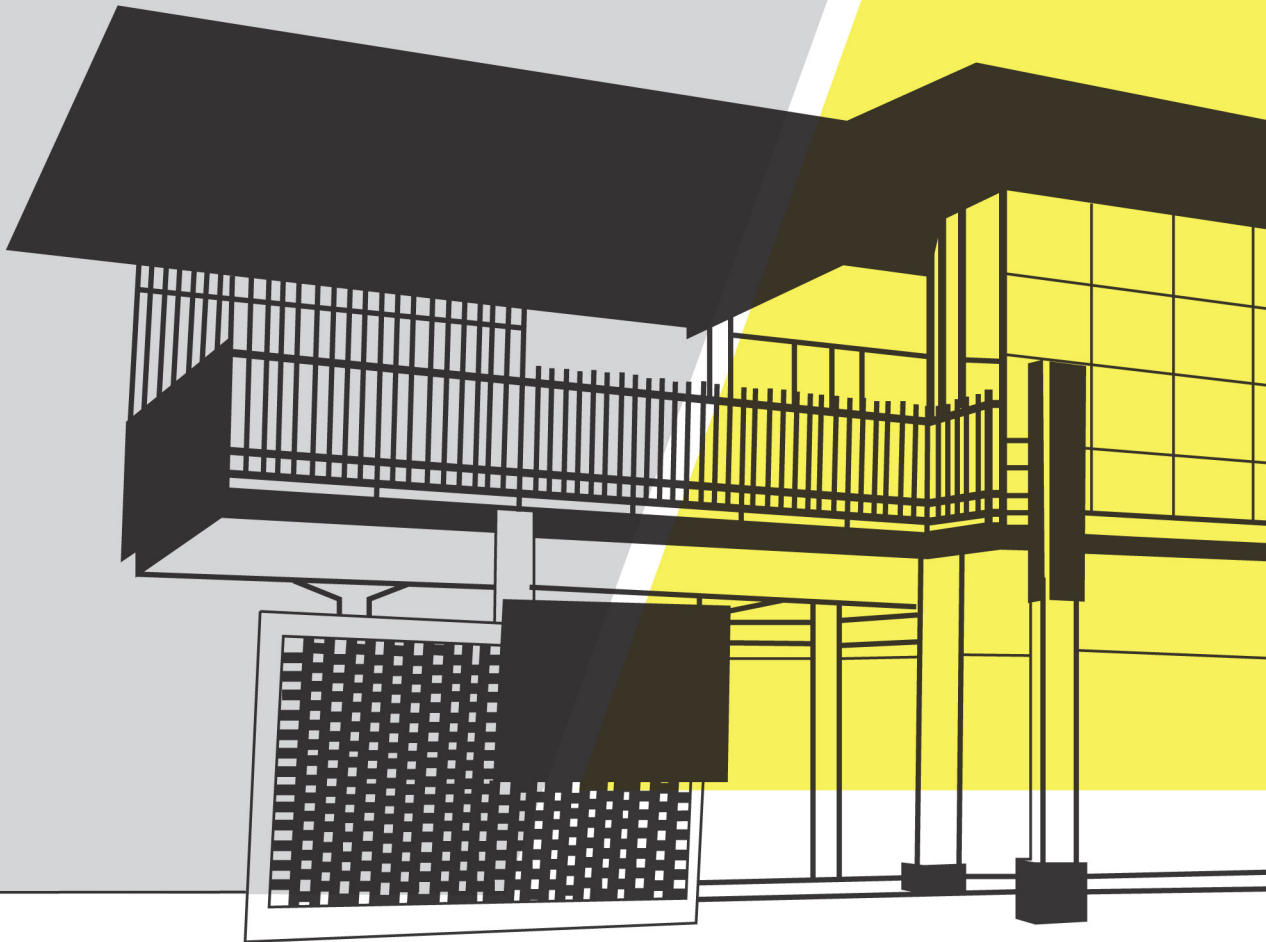
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# ACADEMIC SYSTEM AND REGULATION



## 2. ACADEMIC SYSTEM AND REGULATION

The educational system in the Faculty of Engineering, Universitas Indonesia refers to the prevailing system of education at Universitas Indonesia.

### 2.1. GENERAL

#### Teaching and Learning Activities

One semester is the time of the activity consisting of 16-18 weeks of lectures or other scheduled activities, including various additional activities such 2-3 week assessment activities. These teaching and learning activities are in form of lecture, lab, studio, exams, quizzes, assignments, presentations, seminars, research, practical work, industrial visits, and a thesis.

#### Semester Credits Units (SKS)

Education in the Faculty of Engineering, Universitas Indonesia is held in a variety of ways such as lectures, assignments (ex: calculation tasks, planning, design), practical work, seminars, lab, studio, and research for thesis writing. All educational activities that must be undertaken by each student to earn a bachelor's degree are contained within the academic loads and measured in units of semester credit (SKS).

Semester Credit is a measurement on the learning experiences obtained by students on each semester.

One Semester Credit in lecture, responses and tutorials, includes: face to face study time for 50 (fifty) minutes per week per semester; structured learning activities with structured assignments for 60 (sixty) minutes per week per semester; and independent study session for 60 (sixty) minutes per week per semester.

One Semester Credit in seminar or other similar subjects, includes: face to face study time for 100 (one hundred) minutes per week per semester, independent study session of 70 (seventy) minutes per week per semester.

One Semester Credit in practical training, studio, workshop, on the field training, research and community services, and /or other similar subjects for 170 (one hundred and seventy) minutes per week per semester.

Activities for one semester consist of 16-18 weeks of lectures or other scheduled activities and its additional activities. Also included in the schedule are two weeks of midterm examination and another two weeks for final examination.

All educational activities must be performed by each student to earn a bachelor's degree is an academic load of 144-145 credits divided into 8 (eight) semesters. Undergraduate students with an average study load of about 18-20 credits per semester are expected to undergo a week of minimal 18 -20 hours of scheduled interaction with a lecturer, 18-20 hours of structured activities, and 18-20 hours of independent learning activities.

#### Subjects

Subjects in the FTUI's undergraduate curriculum are grouped into University General Subjects (12,5%), Basic Engineering Subjects (15-20%), Basic Skills Subjects (30-35%), Core Subjects (35-40%). Subjects can be categorized as compulsory subjects and electives. They can be taken across departments or across faculties.

#### Grade Point Average

Grade Point Average or GPA is used to evaluate students' performance either for a particular semester in term of Indeks Prestasi Semester (IPS) or Semester Performance Index, or, cumulatively for all of the semester up to the most recent one in term of IndeksPrestasiKumulatif (IPK) or GPA. The formula used to calculate either IPS or IPK is as follows:

$$\text{GPA} = \left( \frac{\sum_{\text{courses}} (\text{Grade Point Value} \times \text{Semester Credit Unit})}{\sum_{\text{courses}} \text{Semester Credit Unit}} \right)$$

The summation made by multiplying the weight of credits with a letter grade for each course, divided by the number of credits.

### Semester Performance Index / Indeks Prestasi Semester (IPS)

The Semester Performance Index is calculated from all subjects taken in each semester, except for subjects with letter grade of BS, I, and TK. Achievement Index that takes into account all of the subjects for a certain semester is called the Semester Performance Index (IPS) and used to determine the maximum academic load that the student may take in the upcoming semesters.

### Grade Point Average (GPA/IPK)

If the calculation involves the entire grade point value of subjects taken during the educational program period, the result of the summation is a Grade Point Average (GPA) that is used as a basis for study evaluation. Courses taken into account are the ones listed in the Study Plan Form (FRS). GPA is obtained from the summation of all subjects having a grade of C or higher from the first semester until the last semester, with the exception of subjects with letter grade of BS, I, and TK.

### Academic Performance Evaluation

Assessment of academic ability is performed on an ongoing basis by assigning tasks, homework, quizzes, or exams which are given throughout the semester. For each subject, there are at least two components of assessment which may include a midterm exam (UTS) and a final exam (UAS). A student will be assessed on his academic ability if he meets the following requirements:

- The courses taken have been registered and verified by Academic Advisor during the academic registration period.
- The student has fulfilled all of the administrative and academic requirements for the ongoing semester.
- The student has completed all of the required academic assignments.

### Grades

At the end of each semester, students may download Semester Grade Record as a report on their academic performance from SIAK NG. Assessment of study efficacy is carried out using letters and academic load in accordance with Table 2.1.

**Table 2.1. Grade Value and Points**

Grade Value	Marks	Grade Point
A	85 - 100	4,00
A-	80 - < 85	3,70
B+	75 - < 80	3,30
B	70 - < 75	3,00
B-	65 - < 70	2,70
C+	60 - < 65	2,30
C	55 - < 60	2,00
D	40 - < 55	1,00
E	0 - < 40	0,00

The highest grade is A with grade point of 4.00 and the minimum passing grade of a course is C with grade point of 2.00. The instructor may assign the 'Incomplete' (I) grade if the student has not made a reasonable attempt to complete major session assignments, laboratory projects and the lecturer has made a reasonable effort to inform the student as early as possible that an important part of session work is incomplete. The 'I' mark should be changed to other grade within 1 month, otherwise, it will be automatically changed to 'E' grade. The "T" mark is given for no attendance in exam. The "BS" mark is given for Special Lecture (such as Internship, Seminar & Final Project) that has not been completed. These BS courses are not taken into account in the calculation of Semester Study Unit, IPS and GPA.

### Length of Study and Academic Load

#### Undergraduate Program

The academic load a student can take is determined by the Academic Counselor based on the previous Semester Performance Index (IPS) as stated in the Study Plan Form (FRS). Students must take the entire allocated credits of the entire courses in the first and second semester. Academic Load for Undergraduate Program is 144 (one hundred and forty four) credits including final assignment and maximum academic load is 160 (one hundred and sixty) credits including final assignment and can be completed in minimum 7 (seven) semesters and maximum of 12 (twelve) semesters.

As for the second semester, these following rules apply:

- For students obtaining an IPS of 2.00 or less, they must take all credits load allocated for the second semester according to the structure of the applicable curriculum.
- For students obtaining an IPS of 2.00 or more, the maximum credits that can be taken follow that of the provisions in the Maximum Credit Load Table.
- From the 3rd semester onwards, the maximum credit loads that may be taken is determined by IPS of the previous semester and follow provisions in Maximum Credit Load as shown in Table 2.2 with respect to course prerequisites (if any). If necessary, Academic Counselor (PA) can add a maximum of 2 credits more than the provision in the Table through the approval of the Vice Dean.

**Table 2.2. Maximum study load in a semester for undergraduate program**

IPS	Maximum SKS
< 2,00	12
2,00 - 2,49	15
2,50 - 2,99	18
3,00 - 3,49	21
3,50 - 4,00	24

#### Master Program

Academic load in the FTUI's Master Program curriculum is 40-44 credits after finishing the undergraduate program with the following study period:

- For Regular Master Program, the length of study is scheduled for 4 (four) semesters and can be completed in at least 2 (two) semesters and a maximum of 6 (six) semesters.
- For Non-Regular Master Program, the length of study is scheduled for 5 (five) semesters and can be completed in at least 3 (three) semesters and a maximum of 7 (seven) semesters.

Academic Load for each semester is set by the Academic counselor (PA) based on the IPS of the last semester as stated in the Semester Grade list (DNS). Provisions on the academic load are as follows:

- A semester's academic load is registered by a student as he carries out online registration according to the pre-determined schedule. Students are required to take all subjects as allocated in the first semester curriculum.
- For students with less than a 2,5 IPS, a provision stating that the number of credits taken for the following semester does not exceed 9 credits is applicable.
- The maximum number of credits that can be taken on Master Program is 16 (sixteen) credits (for Regular Master Program) and 12 (twelve) credits (for Non Regular Master Program) per semester.

Exemption from the provisions of academic load should be with the permission of the Vice Dean.

**Matriculation for Master**

The Matriculation Program is aimed to synchronize the students' ability to achieve the minimum requirements to continue in the Master Program in the Faculty of Engineering Universitas Indonesia. Matriculation is done by taking classes of subjects required by each Faculty/ Study Program within the Curriculum of Undergraduate Program. The allowed credit load for this Matriculation program is 12 (twelve) credits that can be completed in 1 (one) or 2 (two) semesters. Students are allowed to continue their study in the Master Program only if they passed all Matriculation subjects within the maximum of 2 (two) semesters allowed with a Matriculation GPA of 3,00 (three point zero).

**Doctoral Program**

Academic load in the FTUI's Doctoral Program curriculum is 48-52 credits after finishing the Master Program, including 40 credits of research activities. A semester's academic load is registered by the student through online academic registration during a pre-determined schedule. New students are required to take all subjects as allocated in the curriculum for the first and second semesters. Students must re-take research courses with a BS grade from previous semesters. Student's Academic Load for each semester is established by the Academic Advisor (PA) or the doctorate Promoter based on a discussion with the student from the doctoral program.

The length of doctoral program for all scheduled courses is 6 (six) semesters and in its implementation can be completed in at least 4 (four) semesters and maximum of 10 (ten) semesters. Students in the Doctoral Program may be granted an extension of study period up to a maximum of 2 (two) semesters if their study time have never been extended before, have achieved a minimum grade of B for Research Result Examination, and obtained a recommendation from their promoter and a guarantee that they will complete their study within the granted extended study period. The proposal for such extension is regulated through a Rector's decree based on proposal from the Dean/ Director of School.

**Undergraduate Thesis / Final Project**

Undergraduate Thesis is mandatory course for undergraduate students of Faculty of Engineering UI. The course is the application of science that has been obtained in accordance with the basic scientific disciplines that the student has studied, in the form of scientific paper, engineering design, assembly or models and accessories. Undergraduate thesis is mandatory to complete the requirements in order to earn a degree in the field of engineering. Undergraduate Thesis status is equivalent to other skill courses is tailored in accordance with the scope of each study program. Undergraduate Thesis must meet certain requirements, both academic and administrative requirements. Students are allowed to start composing undergraduate thesis if:

- The Undergraduate Thesis has been registered in the Study Plan Form [FRS]
- Students have obtained a minimum of 114 credits with a minimum of grade of C and have passed all mandatory courses both in the faculty and university level.
- Students have fulfilled all prerequisites set by the Study Program.

Undergraduate Thesis can be taken in both odd and even semester in the running academic year. On SIAK NG system, student must fill out the name of his thesis supervisor and the title of thesis which will be verified by the Vice Head of the Department. At the end of the semester, the Undergraduate Thesis supervisor will submit the student's thesis's grade to SIAK NG and change the title of undergraduated thesis (if necessary). The completed undergraduated thesis must be submitted in the form of hard-covered book and CD within the pre-determined time limit. The undergraduate thesis must first be assessed in an undergraduated thesis examination by the supervisor and examiners assigned by the Head of the Department.

**Thesis (Master Program)**

Thesis is a report of the results of research activities in the form of scientific writing. The thesis topic should be a summary of the subject matter that can be scientifically studied on the basis of the theory and use of certain methods. Thesis should be written in Bahasa with an English abstract. For Master program students who are given the opportunity to conduct research and thesis preparation abroad, they are allowed to write thesis in English with abstracts in the Bahasa, while still following the appropriate format stated in the Final Project Writing Guideline of Universitas Indonesia. Exemption of this rule applies only to study programs that hold a joint collaboration with university's abroad as stated in the charter of cooperation.

Requirements to start making Thesis are:

- Thesis has been registered in Study Plan Form [FRS] in every semester
- Students have passed courses with a load of 20 credits with a GPA  $\geq$  3.00
- Head of the study program has set lecturer's name as a thesis supervisor.

Students are responsible for all thesis research costs. Students can actively meet with any of their lecturers as a potential supervisor, to request a thesis topic. In addition, in middle of the second semester, Head of the Study Program can start announcing thesis topics from which the students of the Master program could chose from to prepare the thesis proposal in the form of seminars. The Head of the Study Program announces a list of thesis supervisor who are assigned to guide the students in writing and finishing the approved topic. Thesis examination committee consists of Head of the committee, a minimum 3 or a maximum 5 examiners including the thesis supervisor. Responsible for the implementation of the thesis is the thesis coordinator in each department. Thesis counseling should be carried out with maximum of two people, Supervisor I and Supervisor II. Supervisor I should have a PhD or Master degree with a minimum of 5 years teaching experience and have expertise relevant to the student's thesis. Supervisor II should at least have a minimal master degree & have expertise relevant to the student's thesis.

Thesis can be submitted for a thesis examination when the thesis has met the following academic requirements:

- Thesis has been registered in Study Plan Form [FRS] in said semester
- The thesis has been declared eligible for examination by the Thesis Advisor
- Students have passed seminar examination and have met the requirements for thesis examination set by the study program.
- The thesis has been declared eligible for examination must be submitted to the Department to be listed in the examination schedule determined by the Head of the Study Program.
- Uploading of Summary of Undergraduate Thesis/Thesis/Dissertation

#### Dissertation

Dissertation preparation are done under the guidance and evaluation of Promoter with the following qualification: Full Time University Lecture; a Professor or Doctor with an academic title of Associate Professor; Have a relevant expertise with the Dissertation Topic; within the last 5 (five) years have written at least 1 (one) scientific paper published in an accredited national journal or a reputable international journal or 1 (one) other similar scientific work acknowledge by a team of expert appointed by the Academic Senate of Universitas Indonesia. Promoter may be assisted by a maximum of 2 (two) co-promoters from within the university, partner universities, or other institutions in cooperation with the promoter team. Co-promoter must have the following qualification: a full time or a part time lecture or an expert from other institution; hold a minimum title of Doctor/Ph.D with an academic title of a minimum Senior Lecture; Have a relevant expertise with the Dissertation Topic.

#### Internship

Internship is an out-of-campus activity to apply the scientific knowledge in a real work situation. Requirements for Internship is set up by each department and is part of the total 144 SKS. Students must find the place to carry out their internship themselves and departments will help by issuing a formal letter requesting the on-the-job training position.

For the undergraduate double degree program, students are required to complete internship when they are in the partner universities. For example in Australia internship is one of the requirements set by the Institute of Engineers Australia (IEAust) to obtain accredited B.E. (Bachelor of Engineering) degree. Internship is a good opportunity for students to apply their skills and build networks in the industry. It is strongly suggested that students should do their Internship in partner universities. However, if they cannot do so it in partner universities, they are allowed to do it in Indonesia with prior permission from partner university.

#### Supplementary Exam

Students are allowed to take a Supplementary Examination for Mid Term and Final Examination the following condition: Sick, Grievance; or representing Universitas Indonesia in a Competition. Students with Sickness excuse are obliged to submit the application for Supplementary Exam signed by their parents/guardian and a Medical Certificate from Doctor or Hospital where they was treated; Students with Grievance or death in the family (death to Father, Mother, Older or Younger Siblings) are obliged to submit the application for Supplementary Exam signed by their parents/guardian; Students representing

Universitas Indonesia in a Competition are obliged to submit a Letter of Assignments/ Letter of Reference stating the Competition which they represented UI in. The Supplementary Exam can only be done by a written consent from the Vice Dean for Academic, Research, and Student Affairs of Faculty of Engineering Universitas Indonesia.

### **Credit Transfer**

Credit Transfer is a recognition process of a number of credits a student may obtained from a university after an evaluation process by a Credit Transfer Team on each Faculty /School in a University. Students who have registered and study at an undergraduate study program or other equivalent education programs, both within the Universitas Indonesia or in any other universities or through a Student Exchange or Study Abroad program, may apply for a Credit transfer, provided that: (i) the transferred credits contain the same material with the courses listed in the curriculum for undergraduate program in FTUI, (ii) the academic record must be dated not more than a maximum of 5 years from the credit transfer application date, (iii) if the academic record are obtained from other universities outside of the Universitas Indonesia, the university should have at least a “B” accreditation from the National Accreditation Board for Higher Education or other international accrediting agencies. The maximum academic load that can be transferred in an Undergraduate Program is a maximum of 50 (fifty) percents of the total academic load that a student is required to complete in accordance to the curriculum of the study program he/she is currently studying. The courses transferred will be indicated with “TK” mark in the academic transcript.

Credit Transfer procedure are as follows: (i) Student submit a letter requesting Credit Transfer to the Head of the designated department, (ii) The Head of the Department will form a team to recommend which courses the student has previously taken can be transferred, (iii) Recommendation will be sent to the Dean of FTUI, (iv) FTUI Dean issues the Credit Transfer Decree, (v) The Faculty’s Center of Administration assigned “TK” marks for all relevant courses in the student’s SIAK NG account.

### **Credit Transfer for Parallel Class Students of Diploma Graduates**

Starting in 2011, all extension programs in FTUI were merged into Parallel Classes in the Undergraduate Program. Diploma graduates who are registered as a student in these parallel classes, credits obtained from the previous diploma program will be transferred in blocks of 38 credits. Students begin their study in the third semester by taking all academic load according to package provided for the third semester. Afterward, they can take credits in accordance with their IPS in the following semester.

### **Study Abroad**

There are many opportunities available for undergraduate students, both from Regular and Parallel programs to participate in Student Exchange program abroad, such as in Japan, Korea, Taiwan, Singapore, and many other countries. Student exchange programs generally last for 1-2 semesters and is supported with a full scholarship. Information on Student Exchange program can be obtained from the Universitas Indonesia’s International Office, PAU Building 1st floor. Courses taken during the study exchange program are transferrable when they return to Universitas Indonesia. Thus, students are still able to graduate on time.

In addition, Undergraduate students can participate in Double Degree 2 +2 International Undergraduate program with FTUI’s partner universities. Students participating in this program will spend the last two years studying at the partner university abroad and he will earn two degrees once he graduates. However, this Double Degree program offers no scholarships. Thus, participating students should ensure their availability of funds. Student participating in classes outside of the university (in the form of Student Exchange, International Undergraduate Dual Degree Program, Sandwich Program, Joint Degree Program, or other university acknowledge program) for at least one semester will be given an “overseas” or study outside of the university status. Before leaving to continue their study overseas, students must ensure that their status in SIAK NG has been change to “overseas”, and they are obliged to make payment to Universitas Indonesia in the amount stated in the applied Rector’s Decree of “overseas” academic fee. Period of study abroad, either on the Student Exchange program and the Double Degree, is counted as part of the whole study period. The result or grades obtained from this program will not be calculated in determining their GPA and will be given a letter grade of TK in their transcript.

### **Fast Track**

FT UI students, Regular, Parallel or International Undergraduate Program, with brilliant academic achievements can participate in the Fast Track program. In this program, FTUI’s undergraduate students in semesters 7 & 8 are allowed to take several Master program courses. Courses that can be taken and



other requirements are specified by the Study Program in a way that the students can directly pursue Master program in FTUI and complete the program in 1 year. Thus, the total time needed to complete both undergraduate and master programs is 5 years or 10 (ten) semesters.

The Academic load for the Fast Track Program curriculum is as follow:

- a. For the undergraduate program is 144 (one hundred and forty four) credits including 16-22 credits of elective subjects taken from the main competence subjects of the Master Program.
- b. For the Master Program is 40-44 credits including the 16-22 credits from subjects mentioned in point a above and are acknowledge through credit transfer.

If student is unable to complete his/her Undergraduate Program in 8 (eight) semesters, then the student will be deemed as unable to complete the Fast Track program, making all the subjects of the Master Program he/she has taken will be considered as an elective subjects in their completion of the Undergraduate Program and cannot be acknowledge as part of their credit towards continuing to the Master Program.

#### **Requirements and Procedure for Fast Track Registration**

Undergraduate students who are interested in participating in the Fast Track Program must fulfill the following requirements:

Having a minimum GPA of 3.50

Having a minimum Institutional TOEFL/EPT score of 500 (students may use the score from the EPT test they took as new student in FTUI)

Having a high motivation for research

Procedure for Fast Track Program:

Fast Track Program is open for all FTUI undergraduate study programs which have the same specialization with the Master programs (for undergraduate study programs that have specialization).

Students who are interested in participating in the Fast Track Program are required to fill out the Registration Form downloadable through the <http://www.eng.ui.ac.id/index.php/ft/downloadindeks> (titled: (FormulirPendaftaran Fast Track Magister FTUI).

Students registering for the BeasiswaUnggulan from the Ministry of Education and Culture selection are required to fill out the BeasiswaUnggulan registration form downloadable from the same web page.

The Fast Track Registration Forms will be evaluated by a team headed by the Head of Department.

If the student's application to participate in the Fast Track scheme is approved, they are required to counsel with his/her academic advisor for the finalization of his/her Undergraduate (S1) and Master (S2) Study Plan. The student's study plan for semester 7 and 8, especially for the undergraduate Elective Course selection must be in accordance with the Compulsory and Elective Courses in their respective Master study program in line with their specialization.

Undergraduate thesis and thesis of the student are expected to be of continuous research to maximize knowledge, experience and quality research result.

The funds for the Fast Track Program will be borne entirely by the student.

**Registration Form for the Fast Track Program for each running Academic Year may be submitted to each Department Secretariat on March each year at the latest.**

## **2.2. ADMINISTRATIVE AND ACADEMIC REGISTRATION**

### **Academic Calendar**

Administrative and academic schedules in FTUI are set in accordance with the administrative and academic schedules in Universitas Indonesia as follows:

#### **Term 1 2016/2017 \*)**

Administrative registration in Universitas Indonesia  
26 July - 25 August 2016

Academic registration in Universitas Indonesia  
23 January 2017 - 3 February 2017

Course period  
29 August 2016 - 23 December 2016

Mid-semester examination  
17 - 21 October 2016

End of Semester Examination  
13 - 23 December 2016

Deadline for grade assignment in SIAK-NG  
5 January 2017

Departmental Judicium  
1<sup>st</sup>, 1 November 2016  
2<sup>nd</sup>, 11 January 2017

Faculty Yudicium  
1<sup>st</sup>, 3 November 2016  
2<sup>nd</sup>, 13 January 2017

Graduation  
4 February 2017

#### **Term 2 \*)**

Administrative registration in FTUI  
23 January - 20 February 2017

Academic registration in FTUI  
23 January 2017 - 3 February 2017

Course Period and examination  
6 February 2017 - 26 May 2017

Mid-semester examination  
27 - 31 March 2017 & 4 April 2017

End of Semester Examination  
15 - 26 May 2017

Graduation  
25 - 26 August 2017

#### **Short Semester \*)**

Administrative Registration  
2 - 9 June 2017

Academic Registration  
19 May - 1 June 2017

Course period  
12 June - 18 August 2017

Mid-semester Examination  
17 - 21 July 2017

End of Semester Examination  
14 - 18 August 2017

Note:

\*) Schedules are subject to change

Note:

- Short Semester course period is held for 8 weeks, including mid-semester and final semester examinations.
- 2 credit courses consist of twice 2-hour contact per week, 3 credit courses consist of three times 2-hour contact per week, 4 credit subject consist of four times 2-hour contact per week.
- For regular undergraduate program: Faculty Basic Courses (Physics, Mathematics and Chemistry) are only available for students who wish to retake the course and have attended required lab activities.
- A student can take up to a maximum of 12 credits during the short semester.
- Courses offered are determined by the Department.

- If the number of students registered for a certain course in the Short Semester does not meet the minimum requirement, then the course will be canceled.
- Short Semester's tuition fee is not included in the normal tuition fee (BOP) and is calculated by the number of credits taken during the short term. Tuition fee for each credit is determined by FTUI.
- Payment for short semester courses must be made before the payment period is closed. Otherwise, the student's name will be automatically removed and the student is no longer considered as a participant in the short semester.

### Registration and Course Guidelines

Before administrative registration takes place, FTUI publishes an academic calendar for one semester listing schedules for courses, mid-term, final-term examinations and other academic activities. The academic calendar and course schedule could be accessed at <http://www.eng.ui.ac.id>, and SIAK NG.

### Administrative Registration

Administrative Registration includes payments of tuition fee and admission fee. Students are responsible for paying fees by the payment deadline. Students who do not complete the registration process by the payment deadline will not be registered at that particular semester will be included toward student's allowed length of study. Administrative registration are done by paying the tuition fee through the host-to-host system by the ATM (Automated Teller Machine) or bank teller of banks in cooperation with the Universitas Indonesia.

### Academic Registration

Students should do online academic registration; consult with his/her Academic Advisor for approval and signing the Course Plan Form or Formulir Rencana Studi (FRS) during the academic registration period. The main duties of Academic Advisor are:

- Helping and directing students in their study plan particularly in selecting courses and in solving their academic problems
- Monitoring and evaluating student's academic performance during their period of study.

Students should logon to <https://academic.ui.ac.id> using username and password provided by the Office of Pengembangan Pelayanan Sistem Informasi (PPSI) UI. Students could get their username and password at PPMT (Pusat Pelayanan Mahasiswa Terpadu) building. Students could also download course schedules and academic calendar from the website.

After completing the online FRS, students should print the form (3 copies) and meet their PA to discuss, verify and validate the courses taken. Students have to check their FRS after registration period to ensure that the courses taken are correct. Fines will be levied to students for late administrative and academic registration, as per the university or the faculty regulation.

### Sanctions

1. Students who do not carry out the administrative registration will receive inactive status as a student in the current semester, which is included as their length of study.
2. Students who do not carry out academic registration cannot follow the academic activities in the current semester, which is included as their length of study.
3. Students who are not active as referred to in points (1) are not charged with tuition payments.
4. Students who do not carry out the registration and administration of academic registration 2 (two) consecutive semesters, expressed as a university student resigned without notice from the university.
5. Active students who do not complete the payment in accordance with the agreement until the end of the semester goes imposed the fine of 50% of the unpaid amount.
6. Payment of fines referred to in points (5) shall be paid at the following semester Academic Registration

### Exception Administrative Registration

When non-active students, with all reason intend to maintain their status as active students, they have to follow the procedure of administrative registration:

- Obtain the approval from FTUI by filling out a form available at PAF (Pusat Administrasi Fakultas/ Faculty Administrative Center).
- The students must come to the Directorate of Finance UI to obtain the approval for paying the tuition fee after paying the penalty 50% from the tuition fee on the current semester.
- The approval will be used by the students for paying the tuition fee manually.
- Students must give the copy of the payment record to the Directorate of Finance UI for verification.

### Prerequisite Courses

These courses can only be taken if a student is currently taking or has previously taken and passed the prerequisite course with sufficient grade [not T].

### Requirements for Transfer to Partner Universities in Australia for Double Degree Program

Minimum requirement of GPA and English before transferring to Partner University is listed in Table 2.3. Eligible students can continue their study to partner universities in Australia if they fulfill the following requirements:

1. Achieve minimum GPA as required at the end fourth semester for the 2+2 program;
2. Passed all required subjects as listed in the Study Program curriculum with minimum C with a total of passed credits consistent with the total number of credits listed in the Study Program curriculum for semester 1-4.
3. Achieve minimum IELTS or TOEFL scores as required.
4. If GPA less than required, the students must stay at UI and repeat some subjects to improve their GPA, while administratively and academically registered at FTUI.
5. If GPA meets minimum requirement, but IELTS or TOEFL scores less than minimum requirement, they are suggested to improve their IELTS or TOEFL score in Indonesia and maintain administrative registration at FTUI. Other choice is to take English for Academic Purposes (EAP) at the partner university. Information on duration and schedule of EAP can be found at the partner university's website.

Table 2.3. Minimum requirement of GPA and IELTS or TOEFL for transfer to the Partner Universities

Partner University	Minimum GPA	Minimum IELTS / TOEFL
QUT	3.0	IELTS min. 6.5 with no band lower than 6 ibT min 90 with no band lower than 22
Curtin		
UQ		
Uni Sydney		
Monash	3.2	

### English Language Requirements for Undergraduate International Program Single Degree

Students of the Undergraduate International Program Single Degree (class of 2012 and after) are obligated to obtain an English certificate in IELTS (International English Language Testing System) or TOEFL iBT (Test of English as a Foreign Language -internet Based Test) with the following minimum score:

Type of Test	Overall Minimum Score	Additional Requirements
IELTS	6.5	No bands lower than 6.0
TOEFL iBT	80	No bands lower than 20

This English Language Certificate is one of the requirements before they may proceed to have their Undergraduate Thesis/ Final Project Exam. The date of said English Language Certificate is taken at least during their third semester of study.

### Procedure for Study Abroad/ Student Exchange to Partner University for Undergraduate International Program Single Degree

1. Student choose a Partner University <ul style="list-style-type: none"> <li>• Find out list of UI's Partner Universities</li> <li>• Information on Study Abroad/ Student Exchange Information from International Office UI through <a href="http://international.ui.ac.id">http://international.ui.ac.id</a></li> </ul>
2. Student contacted the selected partner University for Information on: <ul style="list-style-type: none"> <li>• List of subjects offered and course description</li> <li>• List of requirements/documents needed.</li> <li>• Application and Tuition Fees.</li> <li>• Other Documents needed.</li> </ul>
3. Student consulted their Academic Guidance Counselor or the Vice Head of Department to determine the subjects they will take in Partner University that can be credit transferred upon their return.
4. The Head of Department issued a Letter addressed to the Vice Dean stating: <ul style="list-style-type: none"> <li>• Name and Student ID of student participating in the Study Abroad/Student Exchange Program</li> <li>• Name of Partner University and length of study of said program</li> <li>• List of subjects that the students will take at Partner University.</li> </ul>
5. The Vice Dean will assigned the Associate Dean for Academic and Head of PAF to process the student's status to "overseas" or "student exchange and issued a Reference Letter and Academic Transcript for the student.
6. Student prepare the documents needed for their Study Abroad/ Student Exchange: <ul style="list-style-type: none"> <li>• Application Form</li> <li>• IELTS/TOEFL iBT</li> <li>• Other language requirement</li> <li>• Reference Letter and Academic Transcript from the Faculty.</li> </ul>
7. Student sends their application documents to Partnery University.
8. Student receives Letter of Offer dan Letter of Acceptance from Partner University.
9. Student makes payment and signed the Letter of Offer
10. Student applies for Student Visa to the Country where the Partner University is located.
11. Departure to Partner University

### 2.3. GRADUATE PREDICATE

Students are considered to have passed the undergraduate program and earned a Bachelor Degree (S.T or S.Ars) if they are: registered as an active student in Universitas Indonesia during said semester both administratively and academically; have passed all the mandatory courses and acquired a minimum of 144 credits in accordance with the applicable curriculum with "C" as the lowest grade and completed all 8 semesters scheduled academic load within 8-12 semesters; completed all administrative obligation including the return of all borrowed library and laboratory collection; and complete all obligation of their study period and/or all assignments given in accordance to the curriculum of the Study Program (including revised Final Project) with a GPA  $\geq 2,00$  (two point zero). Honor predicate for graduates are determined by the student's final GPA as follow: Cum Laude (3,51 - 4,00), Very Satisfactory (3,01 - 3,51), and Satisfactory (2,76 - 3,00). For an undergraduate student to earn the Cum Laude degree, he must finished his study within 8 (eight) semesters time without retaking any courses.

Students are considered to have passed the Master program and earned a Master of Engineering or Master of Architecture Degree if they have passed all the required 40 - 42 credits, a  $\geq 3.00$  GPA

with “C” as the lowest grade and do not exceed study period and have met all administrative requirements. Honor predicate for graduates are determined by the student’s final GPA as follow: Cum Laude (3.71 - 4.00), Very Satisfactory (3.41 - 3.70), and Satisfactory (3.00 - 3.40). For a Master program student to earn the Cum Laude degree, his length of study must not exceed 4 (four) semesters time without retaking any courses.

Students are considered to have passed the Doctoral program and earned a Doctor Degree if they have passed all the required 48 - 50 credits, a minimum GPA of 3.00 with a minimum “C” for in-class courses and a minimum “B” for research courses, do not exceed study period and have met all administrative requirements. Honor predicate for graduates are determined by the student’s final GPA as follow: Cum Laude (3.71 - 4.00), Very Satisfactory (3.41 - 3.70), and Satisfactory (3.00 - 3.40). For a Doctoral program student to earn the Cum Laude degree, his length of study must not exceed 6 (six) semesters time without retaking any courses. The mark “BS” is not counted as course repetition. If a student’s final GPA is within the 3.71 - 4.00 range but he fail to meet the other requirements, he will be awarded the “Very Satisfactory” predicate.

## 2.4. ACADEMIC PERFORMANCE EVALUATION AND DROPOUT CRITERIA

### Undergraduate Program

The university also requires that students maintain satisfactory academic performance during their study at FTUI and meet the following evaluation criteria to be able to continue their studies:

- Attain at least 24 credits with a minimum of C at the end of their second semester;
- Attain at least 48 credits with a minimum of C at the end of their fourth semester;
- Attain at least 72 credits with a minimum of C at the end of their sixth semester;
- Attain at least 96 credits with a minimum of C at the end of their eighth semester;
- Attain all required credit with a minimum of C at the end of their twelfth semester;

Or:

- Have the following problem: have an inactive status (empty) for two semesters in a row thus being declared as “resign” automatically from the status of Universitas Indonesia’s student by the Rector’s decree on Status Determination.
- Proven to be in violation of rules or regulations that caused the student to lose his right as FTUI students.
- Deemed unfit to continue their study based on consideration from a team of Doctors appointed by the Head of the University.

Student who still maintain satisfactory academic performance and meet the evaluation criteria to continue his study but would like to resign on his own free will may submit a written application to the Dean with a copy to the Head of the Department.

### Master Program

The Maximum length of study to earn a Master Degree in FTUI is at the latest 6 (six) semesters, starting from registration time to graduation. This provision also applies to students who enroll in the FTUI Master program with a “probation” status. Students will lose their right to continue the study (dropping out) if:

- Students fail to achieve a 3.00 GPA of at least 14-18 passed credits (for regular Master Program student) or 12-14 passed credits (for non-regular Master Program student) at the end of the second semesters;
- In the end of the study period evaluation, students fail to achieve the following graduation requirements: registered as an active student in Universitas Indonesia during said semester both administratively and academically; not exceeding the maximum length of study; completed all administrative obligation including the return of all borrowed library and laboratory

collection; and complete all obligation of their study period and/or all assignments given in accordance to the curriculum of the Study Program (including revised Final Project) with a GPA  $\geq 3,00$  (three point zero)

- Students who do not register academically and administratively for two consecutive semesters.
- Proven to be in violation of rules or regulations that caused the student to lose his right as FTUI students.
- Deemed unfit to continue their study based on consideration from a team of Doctors appointed by the Head of the University.

Student who still maintain satisfactory academic performance and meet the evaluation criteria to continue his study but would like to resign on his own free will may submit a written application to the Dean with a copy to the Head of the Department.

### Doctoral Program

The Maximum length of study earn a Doctoral degree in FTUI is 10 (ten) semesters, starting from registration time to graduation.

**Students of the Doctoral Program (Class and Research)** will lose their right to continue to study (dropping out) if:

- Students who do not register academically and administratively for two consecutive semesters will be automatically considered to have resigned from UI.
- Failed to obtain a minimum of B for their Research Proposal Examination or similar exam at the end of their fourth semester;
- Failed to obtain a minimum of 50 (fifty) percent for their Research based on the judgment of the promoter team at the end of their sixth semester;
- Failed to obtain a minimum of 75 (seventy five) percent for their Research based on the judgment of the promoter team at the end of their eight semester;
- Failed to obtain the following by the end of their study period of ten semesters: produce 1 (one) scientific paper based on research for their dissertation as main writer that can be accompanied by the promoter team and has been accepted to be published in an indexed international journal (8 credits); submit proof of compliance of requirements as stated before as part of the requirements for promotion exam; submit 1 (one) Dissertation and participate in a Promotion Exam as the final step of the Doctoral Program (6-8 credits).
- Exceeded the maximum length of study (10 semesters).
- Proven to be in violation of rules or regulations that caused the student to lose his right as FTUI students.

Student who still maintain satisfactory academic performance and meet the evaluation criteria to continue his study but would like to resign on his own may submit a written application to the Dean with a copy to the Head of the Department.

**Students of the Doctoral Program (Research)** will lose their right to continue to study (dropping out) if:

- Students who do not register academically and administratively for two consecutive semesters will be automatically considered to have resigned from UI;
- Failed to obtain a minimum of B for their Research Proposal Examination or similar exam at the end of their fourth semester;
- Failed to obtain a minimum of 50 (fifty) percent for their Research based on the judgment of the promoter team at the end of their sixth semester;
- Failed to obtain a minimum of 75 (seventy five) percent for their Research based on the judgment of the promoter team at the end of their eight semester;
- Failed to obtain the following by the end of their study period of ten semesters: produce 1 (one)

scientific paper based on research for their dissertation as main writer and be presented at an international scientific conference and published in the proceeding as a full paper (6 credits); produce 1 (one) scientific paper based on research for their dissertation as main writer that can be accompanied by the promoter team and has been accepted to be published in an indexed international journal (8 credits); submit 1 (one) scientific paper that has been accepted to be published in a nationally accredited journal; submit proof of compliance of requirements as stated before as part of the requirements for promotion exam; submit 1 (one) Dissertation and participate in a Promotion Exam as the final step of the Doctoral Program (6-8 credits).

- Exceeded the maximum length of study (10 semesters).
- Proven to be in violation of rules or regulations that caused the student to lose his right as FTUI students.

Student who still maintain satisfactory academic performance and meet the evaluation criteria to continue his study but would like to resign on his own may submit a written application to the Dean with a copy to the Head of the Department.

## 2.5. ACADEMIC LEAVE

Student who wishes to be away from his/her academic endeavors at FTUI for one to two semesters, but intend to return to FTUI are eligible for academic leave of absence. Leave of absence could be only given to student who has studied at least two semesters at FTUI, unless with specific circumstances. Academic leave for special circumstances are academic leave that is given to students for an unavoidable hindrance, such as: state task, university task, or undergoing medication which prohibited said student to participate in academic activity. Academic leave is not counted as part of the length of study.

Procedures of Academic Leave

1. To obtain academic leave, a student must write a letter requesting for academic leave to the Dean before the beginning of the administrative registration period of semester.
2. If the academic leave is approved, PAF will change the status of the student as academic leave before the beginning of the administrative registration period of semester and the amount of tuition fee will automatically be changed.
3. The student must pay 25 % of tuition fee during the period of administrative registration of the intended semester.
4. If a student has been granted an academic leave but fail to pay the obligated fee due to them during the registration period, the academic leave will be canceled and the student status will revert to inactive (empty).
5. In the situation as stated above, if the student still insist on making payment after the registration period has passed, the student will be charged with a late administration registration fee in the amount stated in the regulation issued in the Rector's Academic Fee.
6. If the students fail to pay during the prescribed period of administrative registration, Exceptional Administrative Registration will apply.
7. If the Academic Leave is proposed not accordance with point (1) above, or is proposed after the semester is on, the student should pay full amount (100 %) of tuition fee.

## 2.6. FACULTY and DEPARTMENT JUDISIUMS

Judisium is a meeting held at both the Faculty and the Department level to decide whether a student has fulfill all academic requirements and may graduate and earn a degree in engineering based on the Department / Faculty Evaluation.

## 2.7. SEMESTER GRADE TRANSCRIPT, DIPLOMA and ACADEMIC TRANSCRIPTS

FTUI Central Administration Office is responsible for issuing Semester Grade Transcript, Diploma



and Academic Transcript for all FTUI's graduates. Student Academic History is issued based on student's request while the diploma and academic transcripts are issued only once at the time of the student's graduation. Contained within the Student Academic History and Academic Transcript are name, course code and grades of all courses that the students took during their study period. Also included is the student's Grade Point Average (GPA) which is calculated based on all courses' grades. Diplomas and Academic Transcripts will be handed to all graduates no later than 2 (two) months from the date of graduation.

The Semester Academic Transcript (DNS) gives the information on the student's identity (name, student ID and latest education), Academic Advisor, Faculty, Study Program, Specialty, Education Level, Subject Code, Subject Title, Credit, Letter Grade, Semester GPA, and GPA. The Semester Academic Transcript can be issued as hard copy based on a student request as required. A valid DNS is signed by official handling the academic administration in the Faculty level.

Academic Record recorded chronologically all academic activity of a student since they first registered as a student until they are no longer registered, due to graduation, drop out, or resignation. The academic status of each semester is recorded in the Academic Record. The Academic Record is also used as a source of information for student, Academic Advisor, and Study Program to the success of a student study and is issued as required based on the student's request and validated by the Vice Dean of the Faculty.

Academic Transcript is given to student that has been declared as a graduate from a Study Program which is decided in a graduation determination meeting and contained information on a student identity (name, student ID, place and date of birth), previous education, education level, study program, specialty, list and code number of subjects, letter grade, number of required credits, number of obtained credits, GPA, title of the student's Final Project, diploma number and year of graduation. All subjects taken by the student, including repeated subjects and transfer credit subjects, are included in the Academic Transcript which is issued in two language, Bahasa Indonesia and English. The Academic Transcript will be given to students with no arrears of tuition fees.

Diploma is given to student that has been declared as a graduate from a Study Program which is decided in a graduation determination meeting. Diploma contained information on the identity of the diploma holder (name, place and date of birth), academic title, name and signature of the Rector and Dean, date of diploma issued, date of graduation, student ID, diploma number and signature and photo of the diploma holder. In the event that the diploma is lost or damaged, the diploma holder is allowed to request a copy of the diploma. Dean/ Vice Dean/ Director of Academic on behalf of the Rector may signed to validate a copy of diploma. Diploma will be given to students with no arrears of tuition fees.

## 2.8 OFFENSES AND SANCTIONS

In any particular courses, no students shall engage in any form of unethical or improper conduct, such as but not limited to examination offenses:

Utilizing unauthorized materials/notes to enhance performance during on examination.

Attempting to observe the work of another student.

Taking an examination for another person, or permitting someone else to do so.

Collaborating improperly by joint effort on discussion in anyway expressly prohibited by lecturer.

When incidents, as enumerated above occurs, the following sanctions may be imposed (as per FTUI regulation):

The student may be assigned E for the subject in question

The student may be suspended for one semester

The student may be dismissed or expelled by FTUI

If necessary, a meeting of PanitiaPenyelesaianPelanggaran Tata Tertib (Offence Settlement Committee) (PT32) may be held.

### Academic Sanction for Perpetrators of Academic Cheating In Exams

- a. Academic sanction in the form of the cancellation of said exam (E grade) for student caught or proven committing academic fraud in examination process, such as working with other student, copying other student's work or giving answer to other student;
- b. Academic sanction in the form of study period cancellation (for all subjects) for said semester

- for student caught or proven committing academic fraud in examination process such as opening books, notes or other equipment planned before;
- c. Academic sanction in the form of cancellation study period for said semester and one semester suspension for student caught or proven committing academic fraud in examination process due to working together with outside person(s) outside of the examination room;
  - d. Academic sanction in the form of expulsion from the Faculty of Engineering Universitas Indonesia (expelled) for student caught or proven committing academic fraud in the examination process by replacing other examinee or by having someone else take their place;
  - e. Academic sanction in the form of expulsion from the Faculty of Engineering Universitas Indonesia (expelled) for student caught or proven committing academic fraud in the examination process for planning and carrying out the plan to help other examinee;
  - f. Other academic fraud will be handled through a hearing by the Committee of Rules and Conduct Regulation Violation (Panitia Penyelesaian Pelanggaran Tata Tertib (P3T2)) Faculty of Engineering Universitas Indonesia;
  - g. Student is entitled to an appeal with the help of their Academic Advisor and the Vice Dean for Academic, Research, and Student Affairs Faculty of Engineering Universitas Indonesia, submitted to the Faculty Academic Senate in the quest of justice.

### Academic Sanction on Plagiarism and Act of Fraud in the Completion of Final Project

**Plagiarism** is an act of stealing ideas or thought already available in written and/or someone else's writing and used them as if it is our own ideas, thoughts and/or writing thus causing harm/loss to the original owner both material or non material, this plagiarism can be in the form of using a word, phrase, sentence, paragraph, or even a chapter of someone else's writing or book, without stating the source. Included in this is the auto plagiarism.

**Auto Plagiarisme** is an act of using an idea or thought repeatedly in writing or using someone's own writing in parts or whole without stating the origin published source as if those ideas or thoughts are a new idea, thought and/or writing.

Plagiarism criteria used as a based to decide a sanction focuses on the amount of idea or phrase stolen and how similar the writing in phrase, sentence, paragraph, section, chapter, and the writing as a whole. A work can be considered plagiarism if based on the verification result on the writing contained a similarity level of 35% or more with the original work. To prevent plagiarism, student is obligated to check their final work using software of anti plagiarism provided by the Faculty or University before submitting their work to their advisor/promoter/co-promoter. If such software is unavailable, student is required to check existing list of research in connection to the topic of their research and state such research in their reference of research. Student caught and proven of committing plagiarism is entitled to an appeal tried in the Study Program level to the Faculty which the Faculty will later passed on to the university through the P3T2 to be verified and processed.

In case of an active student, early sanction can be in the form of delaying the final project examination or delaying the graduation status for student who has been declared passing the final project examination. Student that has been declared as a graduate but have not received their diploma, with the approval of the Rector, the Dean may hold said student diploma while await the Rector's final decision. Academic sanction on plagiarism for active student is established through the Dean's decree based on the proposal by the Head of the Study Program or recommendation from the Faculty in one month at the latest since the date of the proposal letter was accepted by the Dean. For graduate student is established through the Rector's Decree based on the P3T2 recommendation. The heaviest academic sanction given can be in the form of cancellation of the student final project (for active student) with the obligation to write a new final project with new topic, while for graduate student the sanction is in the form of revocation of academic titles.

The act of fraud in the writing of Final Project, Essay as Exam Substitute, or Assignment, includes the usage of other person's service/ replacement/ consultant/ or other service to complete assignments in the name of said student and other manipulative act of fraud. This act does not include the usage of service for data collecting, survey, and data processing for the completion of final project of student. Sanction given to the perpetrator of said act of fraud in the completion of final project is established through the Dean's decree issued in one month at the latest since the proposal letter from the Head of Study Program is received by the Dean. The heaviest academic sanction given can be in the form of cancellation of the student final project (for active student) with the obligation to write a new final project with new topic, while for graduate student the sanction is in the form of revocation of academic titles. Active students who consciously act as a ghost writer in writing the final works for other students will be given the equivalent of student academic sanction given to the perpetrators of acts of fraud.

## 2.9. ACADEMIC REGULATION OF THE UNIVERSITAS INDONESIA

List of Academic Regulations at Universitas Indonesia can be accessed via <http://resipatory.ui.ac.id>.

Below is a list of Decrees that functioned as reference for education program at Universitas Indonesia

### GENERAL:

Decree of the Board of Trustees Universitas Indonesia

Number: 008/SK/MWA-UI/2004 on the Amendment of Board of Trustees' Decree Number: 005/SK/MWA-UI/2004 on the Code of conduct on Campus Life in Universitas Indonesia

### EDUCATION:

Decree of the Rector Universitas Indonesia

Number: 285/SK/R/UI/2003 on the Implementation Guidelines for Cross-Faculty Lectures in Universitas Indonesia

Decree of the Board of Trustees Universitas Indonesia

Number: 006 / MWA-UI/2004 on the Universitas Indonesia's Academic Curriculum

Decree of the Rector of Universitas Indonesia

Number: 491/SK/R/UI/2004 on Universitas Indonesia Education Activities Conclusion Regulations

Decree of the Board of Trustees Universitas Indonesia

Number: 001 / TAP/MWA-UI/2005 on the Establishment of Academic Degrees in the Universitas Indonesia.

Decree of the Board of Trustees Universitas Indonesia

Number 003 / TAP/MWA-UI/2005 on General Guidelines for Implementation on Universitas Indonesia's Professional Programs

Regulation of the Board of Trustees Universitas Indonesia

Number: 006 / Peraturan/MWA-UI/2005 on Student Learning Outcomes Evaluation at Universitas Indonesia

Regulation of the Board of Trustees Universitas Indonesia

Number: 007 / Peraturan/MWA-UI/2005 on Academic Education Implementation Norms in Universitas Indonesia

Number: 008 / Peraturan/MWA-UI/2005 on Professional Education Curriculum Norms in Universitas Indonesia

Decree of the Rector of Universitas Indonesia  
Number: 838/SK/R/UI/2006 on Administration of Universitas Indonesia Student's Learning Outcomes

Decree of the Rector of Universitas Indonesia  
Number: 012/SK/R/UI/2007 on Implementation of the of Students Learning Activity in Universitas Indonesia

Decree of the Rector of Universitas Indonesia  
Number: 450/SK/R/UI/2008 on the Implementation of E-Learning in the University Indonesia

Decree of the Dean of Faculty of Engineering Universitas Indonesia  
Number: 290/D/SK/FTUI/VI/2013 on the English Requirements for Undergraduate International Program Single Degree Faculty of Engineering Universitas Indonesia.

Decree of the Rector of Universitas Indonesia  
Number :014 year 2016 on the Implementation of Undergraduate Program in Universitas Indonesia

Decree of the Rector of Universitas Indonesia  
Number :015 year 2016 on the Implementation of Master Program in Universitas Indonesia

Decree of the Rector of Universitas Indonesia  
Number :016 year 2016 on the Implementation of Doctoral Program in Universitas Indonesia

Decree of the Dean of Faculty of Engineering Universitas Indonesia  
Number: 622/D/SK/FTUI/IX/2016 on Academic Sanction for Academic Fraud Perpetrator in Faculty of Engineering Universitas Indonesia.

Decree of the Dean of Faculty of Engineering Universitas Indonesia  
Number: 623/D/SK/FTUI/IX/2016 on General Regulation on Supplementary Exam for Mid Term and Final Examination in Faculty of Engineering Universitas Indonesia.

Decree of the Dean of Faculty of Engineering Universitas Indonesia  
Number: 624/D/SK/FTUI/IX/2016 on Academic Sanction for Plagiarism and Act of Fraud in the Completion of Final Project in Faculty of Engineering Universitas Indonesia.

## RESEARCH

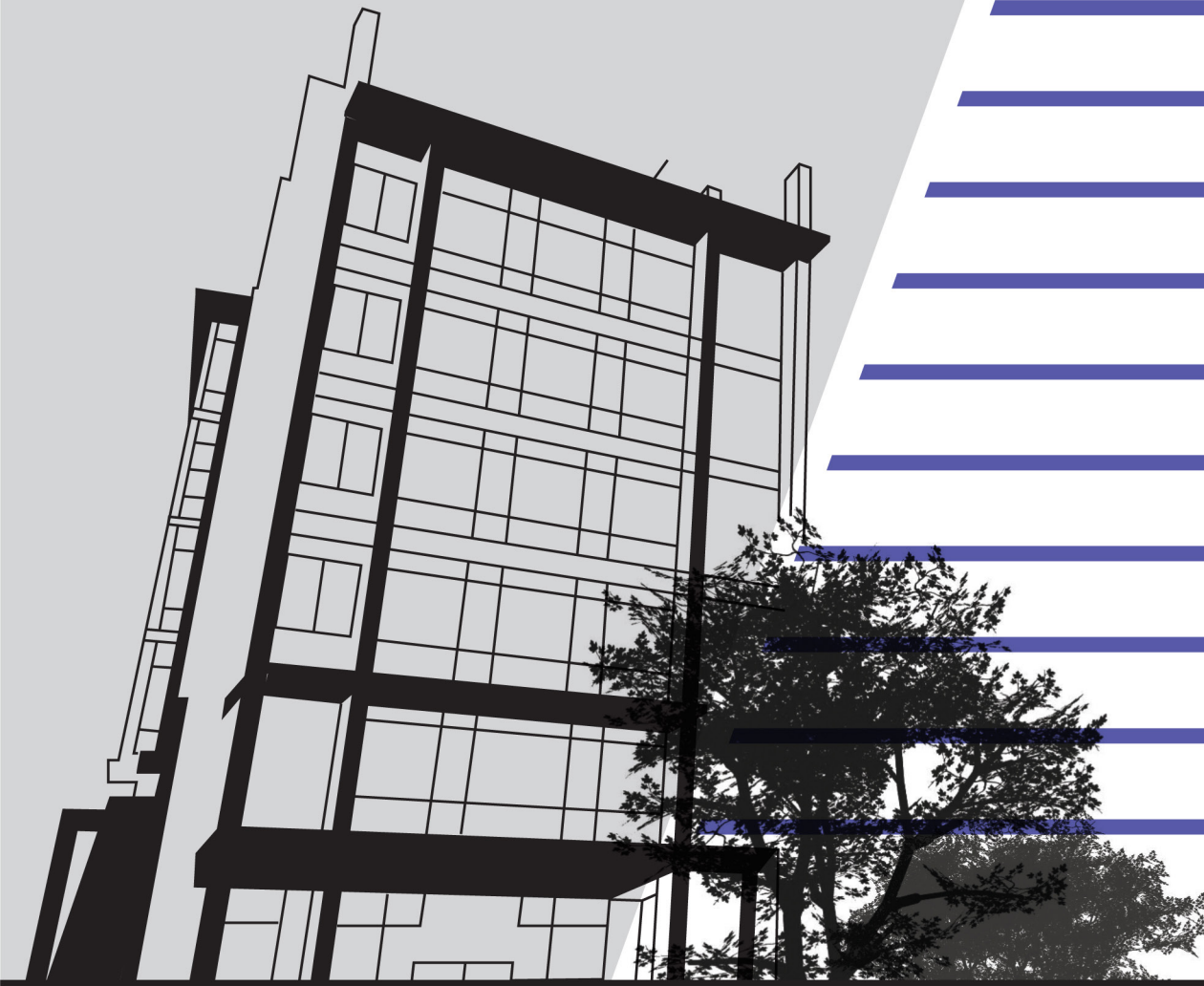
Decree of the Board of Trustees Universitas Indonesia  
Number 002/SK/MWA-UI/2008 on University's Research Norms

Decree of the Board of Trustees Universitas Indonesia  
Number 003/SK/MWA-UI/2008 on Research Policy at Universitas Indonesia

Decree of the Board of Trustees Universitas Indonesia  
Number 009/SK/MWA-UI/2008 on amendment of the Decree of the Board of Trustees of Universitas Indonesia Number 003/MWA-UI/2008 on Research Policy in Universitas Indonesia



FACILITIES  
AND CAMPUS LIFE



### 3. FACILITIES AND CAMPUS LIFE

#### NEW FACILITIES AVAILABLE IN FTUI

1. All classrooms in S building are now having one special chair for each classroom dedicated to left handed students.
2. FTUI has renovated the S405 classroom into a specially design discussion room for students to learn and discuss in groups in the implementation of Student-Centered Learning (SCL). This renovation is partly funded by USAID through their PEER Science research program by providing chairs, computer screen for each discussion group, wireless LCD projector and documented camera. The renovation is completed by the start of the Odd Semester of 2015. The class room will be able to accommodate up to 80 students in groups discussion form as in problem-based learning (PBL) or Collaborative Learning (CL) and up to 100 students in class room form
3. Online Electricity Metering and Monitoring System now help FTUI in monitoring electricity usage of each building and their characteristic. [www.ee.ui.ac.id/power](http://www.ee.ui.ac.id/power); [www.eng.ui.ac.id/power](http://www.eng.ui.ac.id/power)
4. Offline Water Metering and Monitoring System prepare FTUI in determining the water usage of each building and help plan the creation of rain water well within the faculty.
5. Smoking is prohibited throughout most of the faculty areas. However, the new and vastly improved Smoking Shelter is now available in the student’s cafeteria area and in front of the S Building.
6. Starting from April 2012, we have started to tests all of our cafeteria vendors for E-Coli. Working together with the Faculty of Public Health, we conducted several Hygiene tests to our vendors. Between these tests we also conducted seminars, socialization, and counseling to all of our food vendors regarding the level of cleanliness and hygiene level expected from them. We also improved the sewer, sink and the vendor’s facilities to achieve the desired effect. By February 2015, all food vendors in our Student’s Cafeteria are 100% free of E-Coli, Salmonella and Borax. Thus, making us proud to say that FTUI’s Students’ Cafeteria is one of the healthiest in the university.

#### 3.1. INTEGRATED STUDENTS SERVICE BUILDING (PPMT)

This building is located at the left of the Rector building with the one door policy in serving the registration process of all Universitas Indonesia students, whether they are vocational, undergraduate, undergraduate extension, master, doctoral, specialist, and professional students. This building consists of three divisions: PPSI division, Student Affairs division, and Academic division.

#### 3.2. FACULTY ADMINISTRATION CENTER (PAF)

Academic administrative services for all academic programs in FTUI are managed by PAF. The services provided for students include academic records, change of grades from lecturers, testamur and academic transcripts, registration, absence of leave, enrollments and letter of reference letter. The working hour is at 08.00 to 16.00 from Monday to Friday, at PAF building.

#### 3.3. UNIVERSITY CENTRAL LIBRARY

Location : Kampus UI Depok

Service hours of UI Central Library

Monday - Friday	08.30 - 19.00 WIB
Saturday & Sunday	08.30 - 15.00 WIB
Holly Month of Ramadhan	08.30 - 15.00 WIB

#### Membership:

Students, lecturers, researchers and employee of the Universitas Indonesia are entitled for membership of the central library with the following requirements:

1. Provide the latest semester payment proof or the latest study card (IRS) or certification letter from any faculty, unit or department within the Universitas Indonesia.
2. Provide a 2x3 photo (one)
3. Provide a cover letter from the faculty (for lecturers)

#### Lending Procedures:

- General text books can be borrowed for two weeks (max. 3 books) by showing your Student Card. Borrowed books need to be stamped.
- Reference books, magazines, newspaper and thesis can only be read on the spot or photocopied.
- Dissertation and thesis can only be photocopied as many as 10 pages.

### UI Central Library Services

#### Reference Service

This service is provided to help the UI civitas academica in searching information, especially for students who are working on their final assignment or research. Information search request may be submitted in person or via email (reflib@ui.ac.id).

#### Information Package

Information package is a form of service in the form of certain topics of information packages. Each package consists of several articles and their annotation in accordance to the selected topic. Each article can be obtained by contacting the reference division first (reflib@ui.ac.id) or by direct phone request (+6221-7270751).

#### Information Search Training

The information search training consists of several packages. They are: basic and advance package. This training is provided to help improve the information skill of library visitors and members. This service is available to all university members, especially new students and students who are in their final year. Request for training can be submitted directly or through the email perpusui@ui.ac.id

#### Circulation (Borrowing Books)

The circulation services are located in level 1

The library's collection of reference books, thesis, dissertation, research reports and UI-ana can only be read on the spot at the UI Central Library.

### UI Central Library Facilities

#### OPAC (Online Public Access Catalog)

OPAC is a tool to search the information regarding the available collection of the library by using a terminal computer. OPAC computers are available on every floor of the library.

#### Internet Access

Internet access connection at the UI central library uses the integrated network (JUITA - Jaringan Terpadu) and can also be accessed by using the UI Hotspot. Internet service is also available at the first floor of the central library. Also available are computers with internet access for the usage of library visitors and members.

#### Computer, Scanner and Data Backup

Students are allowed to use the provided computers to work on their assignments, picture/photo scanning and to burn the result of their information search to a CD.

#### Photocopy

A photocopy machine is available at the UI Central Library



**Discussion, Class and Seminar Rooms**

Discussion, Class and Seminar rooms are available for students' needs and for classes.

**Special Study Rooms**

Special study rooms are available and can be used by all university members. These rooms are equipped with a desk, filing cabinet and internet access.

**Locker**

250 lockers are available for UI Central Library Members.

**3.4. COMPUTER SCIENCES & NETWORK**

Directorate of Information System Development and Service (PPSI) are responsible for the programmed computer network system designed to help fulfill the students and lecturers needs in computer usage (from academic activities such as programming to internet usage) through the Integrated UI network (JUITA).

Requirements for using the JUITA:

- Registered as a UI student
- Fill out registration form with a reference from the Associate Dean for Students Affairs/ Head of Study Program/Academic Counselor of the student.

Place of Registration:

- Depok (Integrated Student Service Center Building)
- Salemba (PUSILKOM Building)

**Hotline Service**

Users who are experiencing problems in the use of this facility can report or request the help of the Computer Technical Unit through the following PPSI hotline service:

Phone : +6221-7863419  
 Email : support@ui.ac.id  
 Web Site : http/cso.ui.ac.id  
 Office Hours : Monday - Friday  
 (09.00 - 16.00)

**Puskom Services at FTUI**

Puskom (Pusat Komputer) provides services related to education and information technology development for students and academic/non-academic staff. The office is located at 2nd floor of GK Building at FTUI, Depok Campus. Main duties of Puskom is to provide education facilities for students, learning and research facilities for lecturers, and services for education administration, students and personnel. Puskom also provides connection services to internet and local area network at the Faculty and the University. Internet can be accessed at all area of FTUI. This facility can be used by students as well as faculties. All computer networks have been connected by fiber optic cables for inter-building and copper cable in the buildings with capacity of 100 Mbps. Besides providing local networks, Puskom also controls 7 computer servers with redundancy backup to minimize troubles in academic and research services. Computers are also available for students at various locations at FTUI i.e. computer laboratory at 2nd floor of GK Building, as well as at FTUI building at Salemba Campus. The service hour is 09.00 to 16.00 from Monday to Friday. For further information please contact Puskom at GK Building, 2nd floor, tel. 021-7863508, 021-2720011 ext. 64, or send email to puskom@eng.ui.ac.id.

**3.5. STUDENT WELFARE****3.5.1. UNIVERSITAS INDONESIA MOSQUES**

- The Ukhuwah Islamiyah (UI) Mosque Depok located in the UI Depok Campus. Established on

28 January 1987 for the Friday prayer with Prof. H. Moh. Daud Ali, SH as khatib (preacher). This mosque was named Ukhuwah Islamiyah for within this mosque is fostered the Islamic brotherhood within the campus as well as the unity and brotherhood of Moslem from within and outside of campus area.

- The Arif Rahman Hakim (ARH) Mosque Salemba is located in the UI Salemba Campus. Established on 10 November 1967, 27 Rajab 1387 H. Based on the UI Rector Decree dated 16 August 1966, a development committee was established and consist of students. The vision of this mosque is to be the center of Islam education in the campus and produces modern Moslems (equipped with faith and knowledge) that can implement the teachings of Islam and help solve religious problems.

### 3.5.2. TEKSAS BRIDGE

The Teksas Bridge is a linkage bridge between two faculties in the UI Depok campus, the Faculty of Engineering and the Faculty of Humanities. These two faculties are separated by an 80 meters lake. The Teksas Bridge is hoped to serve as:

- As a connection bridge and “Landmark”
- As a research object for steel application product
- As a promotional tool on “Aesthetics Steel”

The concept of this bridge aims towards two approach:

- The side of the bridge on the Faculty of Engineering UI reflects a powerful and masculine character symbolized with a “Sail” shaped Pylon Bridge soaring to the sky as a symbol of “LINGGA”.
- The side of the bridge on the Faculty of Humanities UI reflects a flexible and feminine character symbolized with a “Hole Gate” shaped Pylon Bridge as a symbol of “YONI”.

### 3.5.3. CAMPUS BUS

To serve the transportation needs of students within the campus, Universitas Indonesia provides 20 campus busses. These busses will serve inside campus routes from these times: 07.00-21.00 (Monday-Friday) and 07.00-14.00 (Saturday). These yellow campus busses have two different routes:

- Blue: UI Dormitory, Gerbatama, UI Train Station, Faculty of Psychology, Faculty of Social and Political Science, Faculty of Humanities, Faculty of Economics, Faculty of Engineering, KuKel, Student Center Building, Faculty of Mathematic and Natural Sciences, Faculty of Public Health, Balairung, UI Mosque, and Faculty of Law.
- Red : UI Dormitory, Gerbatama, UI Trains Station, Faculty of Law, UI Mosque, Balairung, Faculty of Public Health, Faculty of Mathematic and Natural Sciences, Student Center Building, KuKel, Faculty of Engineering, Faculty of Economics, Faculty of Humanities, Faculty of Social and Political Science, and Faculty of Psychology.

#### Executive Bus

In order to provide transportation service, especially outside campus transportation, Universitas Indonesia provides Air Conditioned and Non-Air Conditioned busses for rent. These busses are available for various types of activity, such as: UI student organization activities, academic support activities, and many more.

Rental Procedures:

- Written rental request is submitted to:  
Directorate of Student Affairs  
Integrated Student Service Center  
Building, Kampus UI Depok  
Phone : +6221-7867222 (Operator)  
Fax : +6221-7863453
- Payment should be made, at the very latest, one week before the date of use via BNI Bank, Kampus UI Depok Branch, and Account Number: 1273000024 under the name of Universitas Indonesia.
- Proof of payment must be submitted to the Directorate of Student Affairs. Cancellation done 3 (three) days before the date of use will be charge a 10% cancellation fee from the paid rent.

Cancellation on the date of use will be charge a 30% cancellation fee from the paid rent.

**3.5.4. STUDENT WELFARE AND FACILITY BUILDING (GKFM) / University Health Center**

Address : Kampus UI Depok

Phone : +6221-78881019

This building is located in front of the Faculty of Engineering in UI Campus Depok. GKFM / University Health Center Building was built to better serve several important needs of the students, such as:

**Polyclinic Unit**

Provide a free health service to all students of the Universitas Indonesia. Students only need to provide their Student ID card to process their membership card for future medical record to receive this service. There are several services available:

- a. Public Health Service
- b. Dental Health Service

Service Hours:

Monday - Thursday : 08.00 - 12.30  
 and 14.00 - 19.00  
 Friday : 08.00 - 11.00  
 and 14.00 - 19.00  
 Saturday : 08.00 - 12.00

Note:

Aside from the above mentioned facilities for students which are funded by the Students Welfare and Facility Fund, GKFM in UI Depok Campus also provide facilities for blood chemistry examinations, x-ray, and cardiac examination for university members with affordable prices.

**Pharmacy**

The pharmacy provides free medicine for 3 (three) days for UI students who seek treatments in the Polyclinic unit. The pharmacy also provides various other medicines for first aid needs for general public purchase.

**UI Student Counseling and Guidance (BKM)**

In providing service in the mental welfare of the UI students, the Student Counseling and Guidance is a place where UI students can receive psychological help in dealing with academic, personal or family problems. These psychological help are given in the form of counseling and guidance. Guidance service is the provision of information (to an individual or group) with the purpose of making sure that students are able to learn and build an optimal social relationship. Counseling service is the process of giving help to students and support student in finding a way to solve his problem. Here, a counselor functions as a facilitator.

**Services in the UI Student Counseling and Guidance**

The routine services provided by the BKM UI are counseling and guidance services daily which are done at:

Service Time : Monday - Friday  
 Service Hours : 09.00 - 15.00  
 Place : Student Welfare Center  
 2nd floor, Student Welfare & Facility Center Building  
 UI Campus Depok  
 Phone : +6221-96384797

BKM UI staff of counselors consists of psychologies, psychiatrists, and academic counselors.

**Problems handled by BKM UI**

Generally, the problems handled by the BKM UI consist of academic, personal, family, and social

problems.

#### **BKM UI's other services:**

- Online counseling
- Peer counseling training
- Counseling training for counselor lecturers and BKM management in the faculty level.
- Coordinate meeting between BKM in the university and faculty level.
- Personality development training
- Group therapy

#### **UI Salemba Polyclinic**

For students in the UI Salemba Campus, the university also provides similar health service in the polyclinic for public health service.

Service time : Monday - Friday: 08.00 - 12.00  
and 14.00 - 18.00

#### **3.5.5. UI STUDENT DORMITORY**

Location : UI Campus, Depok

Phone/Fax : +6221- 7874414 /  
+6221-7874271

Capacity : 594 rooms for male students housing, 656 rooms for female students housing (including the VIP - AC rooms)

Facility : TV, cafeteria, public pay phone, public internet shops, computer rental

#### **UI Wismarini Student Dormitory**

Location : Jl. Otto Iskandar Dinata No. 38, East Jakarta, Indonesia

Phone/Fax : +6221-8195058

Capacity : 72 rooms for male students housing, 111 rooms for female students housing

Facility : Badminton court, TV, cafeteria, Table Tennis

The UI Wismarini student dormitory is provided to students from the Salemba Campus (Faculty of Medicine & Faculty of Dentistry).

#### **Facility**

- Standard housing facility: Bed, table, chair, wardrobe, shoe rack, lamp, bathroom, wash basin.
- Technology facility: Public pay phone shops, public internet shop, photocopy
- Public facility: Cafeteria, praying room, laundry service, sport facility, car/motorcycle parking areas, minimart, dormitory market

#### **Room Specification**

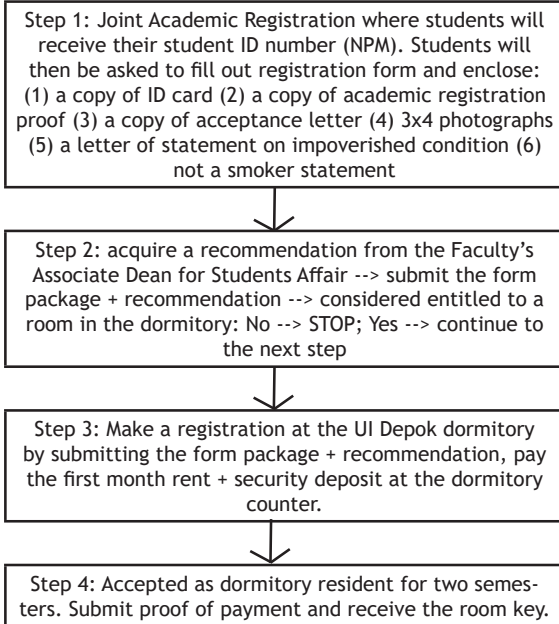
- Standard room: Standard bed, table, chair, bookcase, wardrobe, shoe rack, lamp, outdoor bathroom, non AC.
- Standard plus room: Standard bed, table, chair, book case, wardrobe, shoe rack, lamp, outdoor bathroom, air conditioned.
- Bungur and Melati room: Spring bed mattress, table, chair, indoor bathroom, wash basin, small kitchen, living room, air conditioned.
- VIP room: Spring bed mattress, table, chair, indoor bathroom, wash basin, small kitchen, living room, air conditioned.

#### **Other information**

- UI Depok dormitory has their own set of rules and regulations which must be obeyed by all dormitory residents as an attempt to create conducive environment for dormitory residents and as an attempt to maintain harmony among the various elements of the UI Depok dormi-

- tory residents.
- Each undergraduate student residents of the UI Depok dormitory are entitled to live in the dormitory for one year (semesters 1 and 2).
- Residents will be charged for every electronic device which they brought to their dormitory rooms.
- For further information, please contact UI Dormitory secretariat at +6221-78744144 or by clicking <http://asrama.ui.edu>.

**Registration Process Flow Chart for UI Dormitory**



**3.5.6. WISMA MAKARA**

Phone : +6221-78883670, 78883671  
 Reservation : +6221-78883672  
 E-mail : [info@makara.cso.ui.ac.id](mailto:info@makara.cso.ui.ac.id)  
 Website : <http://www.wismamakara.com>

Wisma Makara, located within the UI Depok campus, is a choice of accommodation for the Southern Jakarta and Depok area. This hotel is very suitable for seminar, training, workshop activities. Surrounded by rubber trees and a lake; the hotel’s cool, calm, and beautiful atmosphere provides the perfect background for your various activities. The hotel’s tranquility also makes it very suitable for those of you who need tranquility to work and rest.

Available facilities:

- 70 fully furnished rooms (AC, TV, refrigerator)
- Restaurant
- Swimming Pool
- Coffee Shop
- Meeting room (up to 100 person capacity)
- Pay phone shop and internet shop
- Photocopy
- Ballroom (with 800 person capacity)
- Parking area

### 3.5.7. UI STUDENT ACTIVITY CENTER (PUSGIWA)

Location : UI Campus Depok

Phone : +6221-7270201

Pusgiwa UI is a place for various student activities in Universitas Indonesia. Here we can find secretariat offices of various UI student organizations. Pusgiwa also provides many facilities for students' activities such as an 300-400 person auditorium.

### 3.5.8. UI STUDENTS HALL

Location : UI Salemba Campus

Capacity : 300 People

Phone : +6221-31901355/56

The UI Salemba Student Hall is one of the facilities in UI under the management of Directorate of Student Affairs and Alumni Relation. This hall is often used for various activities such as meetings, seminars, workshops, and many more. The hall is available for use by the university members and public.

### 3.5.9. SPORT FACILITIES

#### A. Stadium

- Football field
- Triple Jump Field
- Athletic Field

#### B. In Door (Gymnasium)

- Badminton court
- Volleyball court
- Basketball court

#### C. Out Door

- Hockey field
- Basketball court (3 lines)
- Badminton court (1 line)

Permit form or letter for the use of UI Student Activity Center (Pusgiwa), UI Student Hall, and Sport Facilities must be submitted to the Directorate of Student Affairs and Alumni Relation UI located at the Student Activity Center Building, UI Campus Depok.

Phone : +6221-7866403, 7863453

Fax : +6221-7863453

at FTUI, several sport facilities are available: basket ball court, futsal court and climbing wall.

### 3.5.10. BIKE TO CAMPUS

As a proof to Universitas Indonesia's commitment in implementing the "Go Green" program, UI has provided free bicycles as a mean of transportation within the campus area. Started in 2008, this program establishes collaboration with the Bike to Work and Polygon, making UI the first campus in Indonesia with their own Bike to Campus program.

These bicycles, which colors and form are specially design for UI, are single seat bicycles. By July 2009, there are around 300 units of bicycle available for use and will continue to be added in accordance with the campus development or demand.

How to Borrow:

1. Students simply showed their student ID card (KTM) to officer in charge of each bike shelter.
2. Campus bicycle can only be use on the available bicycle track. It is forbidden to ride them outside of the available track or to take them outside of campus area.
3. Each bicycle is equipped with a trunk with a maximum capacity of 10 kg and is not to be use as a passenger space.
4. Borrowed bicycle is the responsibility of each student until it is returned to the officer in

charge of each bike shelter.

5. Students may return the borrowed bicycle at the nearest bike shelter by showing their student ID card (KTM) to the officer of said shelter.

Service time for Bike to Campus is Monday to Friday, 08.00 - 17.00. For usage outside of service day and time, interested party must coordinate in accordance to the existing regulation.

A few points worth noting in cycling:

Once you've received your borrowed bicycle from the shelter officer, please do the following:

1. Make sure that your bicycle are in good order and function well.
2. Make sure that you have both hand on the bicycle handle, put your books/bags on the provided space.
3. Arrange your seat in accordance to your height, the height of your seat determines your comfort in cycling.
4. Each bicycle has three shifter levels, use them in accordance.
5. Ride the bicycle on the provided track, stay at the left side of the track when passing other bicycle.
6. Pay special care to motorcycles at each crossing.
7. Pay special attention to cycling safety.

### 3.6. STUDENT ORGANIZATION

Students are a nation's agent of change in making changes towards a fair and prosper independent society. Their power in fighting and struggling toward that goal must always be balanced with moral power as future asset in their fight in realizing the country's objectives. Thus, students need a vessel where all of their independent, family oriented, scientific, society oriented, and open activities can be accommodated. In Universitas Indonesia, this vessel is called Universitas Indonesia Student Society Association (Ikatan Keluarga Mahasiswa Universitas Indonesia - IKM UI).

IKM UI is a formal and legal organization which is the parent organization for all student activities in Universitas Indonesia. IKM UI adopts constitutional values adapted with the need of student lives. Sovereignty of IKM UI lies in the hand of the students and is fully implemented according to Laws and Constitution of IKM UI. The members of IKM UI are registered students in the Universitas Indonesia, consisting of active and regular members. Active members are IKM UI members that have followed active member admission procedures and received recommendation from the faculty. Regular members are IKM UI members that are not registered within the active membership of IKM UI. The symbol of the Universitas Indonesia Student Society Association (IKM UI) is the Makara of Universitas Indonesia with the wording IKATAN KELUARGA MAHASISWA UNIVERSITAS INDONESIA in black.

Student organizations that are incorporated within the IKM UI are:

1. Students Forum
2. Students Representative Council
3. Student Executive Body
4. Financial Audit Agency
5. Student Court
6. Student Element of the Board of Trustees
7. Autonomous Body of the Student Activity Unit
8. Semi Autonomous Body of the Student Activity Unit

#### Students Representative Council (Dewan Perwakilan Mahasiswa - DPM)

Students Representative Council is the high level body within the Universitas Indonesia Student Society Association (IKM UI) which possesses a legislative power. Members of the DPM UI consist of independent members from each faculties and representatives of legislative bodies of each faculty. Independent members are voted through a general election, while there can only be one

representative from each faculty's legislative body. Membership of DPM UI is inaugurated by a student forum decree. Term of office for members of the DPM UI is one year and ended simultaneously with the inauguration of the new members of the DPM. The requirements for becoming a member of the DPM UI are regulated within the IKM UI laws. DPM UI has the authority in term of legislative, supervision, and assessment of Students Representative Council's (BEM UI) Work Accountability Report, jurisdiction, facility, and designing the admission mechanism and follow up on financial budget plan of each student organizations within the Universitas Indonesia for each period of management. Members of the DPM UI are entitled to interpellation right, voting right, and the right to convey suggestion and express their opinions.

Secretariat : Student Activity Center  
 Building (Pusgiwa), 2nd floor  
 Phone : +6221-94629107,  
 +6285717884964

#### **Students Representative Council (Badan Eksekutif Mahasiswa - BEM)**

Universitas Indonesia Students Representative Council is a student organization within the university level with the executive power. Term of office for UI Students Representative Council is one year, from January to December each year. Chairman and Vice Chairman of BEM UI are elected as a couple directly by members of the IKM UI in a Universitas Indonesia General Election. The elected Chairman and Vice Chairman of BEM UI are later officially inaugurated with a Student Forum Decree. Function and authority of BEM UI are, among other: advocate students in issues relating to funds and facilities at the university level; addressing the external politic policy of IKM UI; serve and coordinate with the Universitas Indonesia Autonomy Body of UKM UI, faculty's executive body, and student element of the Board of Trustees. BEM UI Board of Administrators is elected based on open and close recruitment mechanism.

#### **Student Activity Unit (Unit Kegiatan Mahasiswa - UKM)**

Student Activity Unit of Universitas Indonesia (UKM-UI) is a place of student activities and creations in the Universitas Indonesia in one area of specialization, talent and religious services at the university level. The Student Activity Unit consists of the Autonomy and Semi Autonomy Bodies. Universitas Indonesia UKM Autonomy Body is a UKM in the university level which is deemed qualified and valid by the decree of the Student Forum into an autonomic UKM UI Autonomy Body. While the Universitas Indonesia UKM Semi Autonomy Body is a place of student activities and creations in the Universitas Indonesia in one area of specialization, talent and religious services at the university level under the coordination of the Students Representative Council.

##### **a. Art**

1. Krida Budaya Dance League
2. Madah Bahana Marching Band
3. Mahawarditra Philharmonic
4. Paragita Choir
5. Student Theater

##### **b. Sport**

- |                |                  |
|----------------|------------------|
| 1. Badminton   | 8. Soft Ball     |
| 2. Hockey      | 9. Bridge        |
| 3. Tennis      | 10. Futsal       |
| 4. Soccer      | 11. Dance Sport  |
| 5. Basket Ball | 12. Cricket      |
| 6. Swimming    | 13. Table Tennis |
| 7. Volley Ball |                  |

##### **c. Martial Art**

1. Taekwondo
2. Merpati Putih
3. Aikido



4. Wushu

**d. Religious Groups**

1. Moslem Student Society (Nuansa Islam Mahasiswa - SALAM)
2. Catholic Student Society (Keluarga Mahasiswa Katolik - KMK)
3. Oikumene Civitas Academica Society (Persekutuan Oikumene Sivitas Akademika - POSA)
4. Buddhist Student Society (Keluarga Mahasiswa Budhis)
5. Hindu Student Society (Keluarga Mahasiswa Hindu)

**e. Academic Group**

1. Eka Prasetya Student Study Group (KSM EP)
2. English Debating Society (EDS)

**f. Entrepreneurship**

1. Student Voice
2. CEDS
3. Student Radio (RTC UI FM) 107,9

**g. Others**

1. Wira Makara (Student Regiment)
2. Students' Mountaineering Club (Mapala)

**3.7. CAREER DEVELOPMENT CENTER (CDC)**

Career Development Center is a center with the aim of preparing UI graduates to have more skill and higher level of competitiveness and at the same time channeled UI graduates to the working world. CDC is located in the Student Center Building.

Phone/Fax : +6221-70880577/78881021

Email : cdc-ui@ui.ac.id

FTUI also has a CDC, located at 3<sup>rd</sup> floor of Engineering Center (EC) Building.

Phone : +6221-78880766

**3.8. NATIONAL STUDENT SCIENCE WEEK**

The National Student Science Week (Pekan Ilmiah Mahasiswa Nasional - PIMNAS) is a prestigious event for all Universities in Indonesia organized by the Directorate General of Higher Education (DIKTI). The Adikarta Kertawidaya trophy is the award contested at the PIMNAS. PIMNAS is an opportunity to channel the creativity, education and community service of the society in a Student Activities Program. Below is some of the Student Activities Program being contested within the National Student Science Week.

**Student Creativity Program - Research (PKM-P)**

This program is a research program that aimed to identify the determinants of the quality of the product, find a causal relationship between two or more factors, experimented with a form or equipment, to establish the method of learning, conduct an inventory of resources, modifying existing products, identify the chemical compounds in the plants, testing the efficacy of plant extracts, formulate marketing techniques, a health survey of street children, teaching methods Balinese script in elementary school students, the rate of economic growth in the craft center of Kasongan, superstition factor that characterizes the behavior of the Javanese community and other activities that have such a purpose.

**Student Creativity Program - Technology Application (PKM-T)**

This program is a technology assistance program (quality of raw materials, prototypes, models, equipment or production processes, waste management, and quality assurance systems and many other) or other micro-or small-scale industries (home industries, small traders or cooperation) as needed by the potential partners in the program. PKMT require students to exchange ideas with

their partner in the program first, because the product is a solution of a problem which the PKMT partner prioritizes. Thus, in the proposed program, the student must attach a Statement of Willingness to Work Together with Partner on a paper with Rp. 6000, - seal.

#### **Student Creativity Program - Entrepreneurship (PKM-K)**

This program is the where students develop their skills in entrepreneurship and is a profit oriented program. Business commodities produced can be in the form of goods or services which in turn are one of the basic capital students will need in entrepreneurship and to enter the market.

#### **Student Creativity Program - Community Service (PKM-M)**

This program is an assistance program in science, technology, and arts in an effort to increase performance, build business skills, structuring and improving the environment, strengthening community institutions, the socialization of rational drug use, exposure to and understanding aspects of customary law, relief efforts on illiterates in the society and other community programs both for formal and non-formal societies.

#### **Student Creativity Program - Writing Scientific Articles (PKM - AI)**

This program is a program of writing a scientific article which originated from student activities in education, research, or community service which the student has done himself (case studies, field practice, community development work, student creativity program, internships, and many other).

#### **Student Creativity Program - Written Concept (PKM - GT)**

This program is a program of writing a scientific article that originated from ideas or concepts from a group of students. This written idea refers to an actual problem that can be found in the community and require a smart and realistic solution. In each area these programs are subdivided into seven groups of fields of science, namely:

1. Health field, including: Pharmacy, Nutrition, Obstetrics, Medicine, Dentistry, Nursing, Public Health, and Psychology.
2. Agricultural field, include: Veterinary Medicine, Forestry, Maritime, Fisheries, Agriculture, Animal Husbandry, and Agricultural Technology.
3. Mathematic and Natural Sciences field, including: Astronomy, Biology, Geography, Physics, Chemistry, and Mathematics.
4. Technology and Engineering field, including: Information Technology, Engineering, and Agricultural Technology.
5. Social Economy field, including: Agribusiness (Agriculture), Economic, Social and Political Sciences.
6. Humanities field, including: Religion, Language, Philosophy, Literature, and Art.
7. Education field, including: Education Sciences study program under the Faculty of Education.

Submission deadline for PKM-K, PKM-M, and PKM-P proposals are in October of each year, while deadline proposals for PKM-GT and PKM-AI are in March of each year. Almost all of these areas can be followed by students in 12 faculties at UI. PIMNAS is a means to prove the existence of UI as a research university in Indonesia. Win the Adikarta Kertawidya trophy and show the existence of UI as the Research Campus.

For further information :

<http://bem.ui.ac.id/>

<http://mahasiswa.ui.ac.id/info-pkm-2010.html>

### **3.9. SCHOLARSHIP**

Universitas Indonesia currently manages approximately 71 scholarships both from the government and the private sector. Information about scholarships can be obtained at the Student Affairs Division of each faculty or through the website of the Directorate of Student Affairs at [www.mahasiswa.ui.ac.id](http://www.mahasiswa.ui.ac.id).

There are two types of scholarship in UI:

- UI Scholarship
- Donor/Sponsor Scholarship

General requirement procedure for scholarship application from Donor/Sponsor:

- Submit application through the Faculty Head with a recommendation from the Associate Dean of Student Affairs.
- Submit a photocopy of academic transcript stating a GPA corresponding with the requirement given by the donor/sponsor.
- Not a smoker.
- Is not a receiver of similar other scholarship.
- Other requirements as stated by the Donor/Sponsor.

**LIST OF NAME OF SCHOLARSHIP DONOR/ SPONSOR FOR UNIVERSITAS INDONESIA STUDENTS**

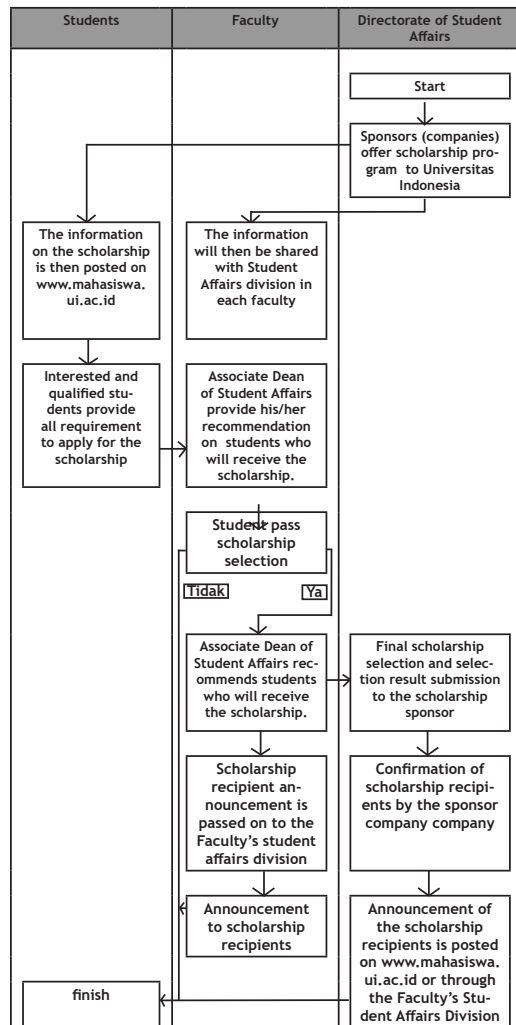
1. Bank BNI 46
2. Bank Central Asia
3. Bank Indonesia
4. Bank KEB Indonesia
5. Bank Lippo
6. Bank Mandiri
  - Bank Mandiri
  - Bank Mandiri Prestasi
7. Bank Mayapada
8. Bank Niaga
9. Bank Permata
10. Bank Tabungan Negara
11. Student Special Aid
  - Special Aid for Undergraduate Program Student
  - Special Aid for Vocational Program Student
12. BAZNAS
13. West Java Scholarship
14. BMU Scholarship
15. CIMB Niaga Excellent Scholarship
16. DKI Jakarta Scholarship
  - Jakarta Achievement Scholarship
  - Jakarta Thesis Scholarship
17. BPMIGAS
18. BRI
19. BUMN
20. DIKNAS
  - Diknas (Excellent Activist Scholarship)
  - Diknas (Excellent Master Scholarship)

- Diknas (Super Excellent Scholarship)

21. Diknas 1 (BBM)
22. Diknas 2 (PPA)
23. Eka 2007 - 2008
24. Eka 2008 - 2009
25. Eka Cipta (Uang Buku)
26. Exxon MOBIL (For Students from Aceh)
27. Exxon MOBIL (For Students from Aceh)

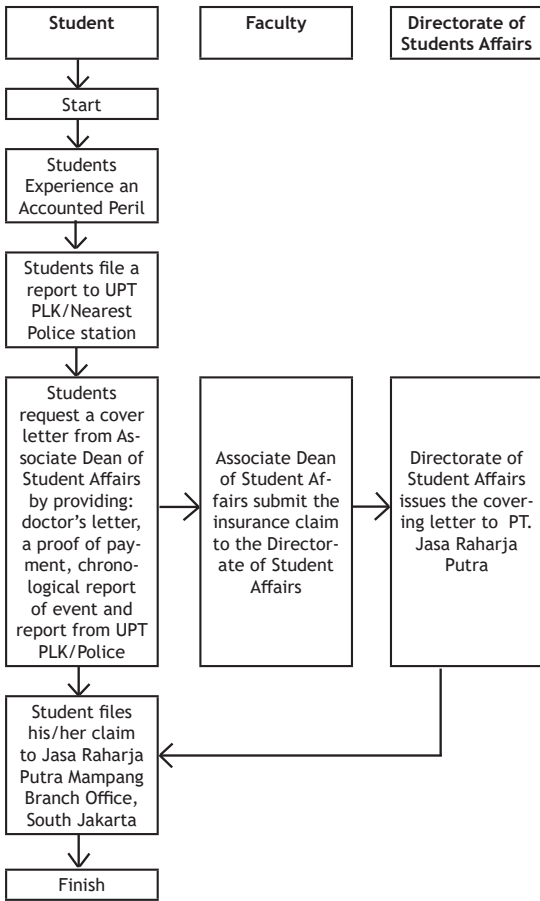
Thesis

28. Indosat
29. Karya Salemba 4 (KS 4)
30. KORINDO
31. **Flowchart of Scholarship Application**



32. MARUBENI
33. MC.DERMONT
34. Part Time Job
35. Posco (Thesis Aid)
36. PPA/BBM Angkatan 2009 - PPA/BBM DIII  
- PPA/BBM S1
37. PPE
38. PT. BUMA Apparel Industry
39. PT. Coca Cola
40. PT. Indocement
41. PT. Accenture
42. PT. Sun Life Indonesia
43. PT. Thiess
44. Qatar Charity
45. Recapital
46. Rotary Club Jakarta Sudirman
47. Salim
48. Sariboga
49. Shell (Extention Scheme)
50. Shell (New Scheme)
51. Sime Darby
52. Sumitomo Bank (Supportive Scholarship)
53. Sumitomo Bank (Full Scholarship)
54. Sumitomo Corporation Scholarship
55. Supersemar
56. Tanoto
57. Tanoto S2
58. Total E & P
59. TPSDP (DIKTI)
60. UFJ Foundation / Mitsubishi
61. Unilever
62. Y. Asahi Glass (YAGI)
63. Y. Toyota (REGULER)
64. Yayasan IJARI
65. Yayasan Goodwill Internasional
66. YAYASAN TIFICO
67. YKPP - Pertamina - YKPP - Pertamina (Living Allowance)  
- YKPP - Pertamina (Tuition Fee)

Insurance Claims Process



Cause	Condition	Required Document
Train Accident	Injured	1. A notification letter from the Faculty's Associate Dean of Student Affairs to the Directorate of Students Affairs.
		2. Accident Report issued by the police
		3. Treatment report from the attending doctor
		4. Original receipt from the hospital or the attending physician
	Death	1. A notification letter from the Faculty's Associate Dean of Student Affairs to the Directorate of Students Affairs.
		2. Accident Report issued by the police
		3. Accident Report from Polsuska (PT. KAL)
		4. Autopsy report from the hospital
		5. Death Certificate
		6. A copy of the victim's birth certificate
		7. A copy of Family Card
		8. Heir certificate letter from the local district office.
Road Accident	Injured	1. A notification letter from the Faculty's Associate Dean of Student Affairs to the Directorate of Students Affairs.
		2. Accident Report issued by the police
		3. Treatment report from the attending doctor
		4. Original receipt from the hospital or the attending physician and the pharmacy
	Death	1. A notification letter from the Faculty's Associate Dean of Student Affairs to the Directorate of Students Affairs.
		2. Accident Report issued by the police
		3. Accident Report from Transportation Agency
		4. Autopsy report from the hospital
		5. Death Certificate
		6. A copy of the victim's birth certificate
		7. A copy of Family Card
		8. Heir certificate letter from the local district office.

### 3.10. INSURANCE

Each student enrolled in Universitas Indonesia for each running semester (participate in academic activities) will also be registered as an insurance member of PT. Asuransi Jasa Raharja.

For these insured students, they are allowed to submit an insurance claim in accordance with the following provisions:

- Accidents included within the insurance claim are accidents which occurred during the student's journey from home to UI campus to participate in academic and extracurricular activities whether it is within or outside of Campus area and with the UI/Faculty's Management's knowledge and permission.
- Compensation on claim regarding students' accident is only applicable to those who have paid the DKFM fee for the semester.
- In the event of an accident, student must report the accident no later than 3x24 hours to the office of the Universitas Indonesia Directorate of Student Affairs Sub Directorate of Student Welfare Services or the nearest PT Jasa Raharja Office Branch.
- If after 180 (one hundred and eighty) days, the accident is not reported, insurance compensation shall be canceled.
- Compensation claim (for victims suffering from injuries) must be submitted by attaching the original and valid receipt from doctor/hospital/clinic that treated the student's injuries.
- Non-medical care or treatment is not compensable.
- Students may send their inquiries regarding any matter that are not listed here directly to the Universitas Indonesia Head of Student Welfare Sub Directorate at the Central Administration Building, Universitas Indonesia Campus, Depok.

Compensation Receivable from the Insurance Claim \*)

Death due to an accident :

Rp. 5.000.000, -

Permanent disability due to accident :

Rp. 10.000.000, -

Care / medical Treatment due to accident (maximum payment) :

Rp. 3.500.000, -

\*) Subject about to change without notice

### 3.11. GENERAL INFORMATION

#### Post Office, Depok Campus

The Depok Campus Post Office offers postage stamp sales, special delivery mail delivery, registered mail, parcel post, money orders, checks and postal giro and savings services such as Batara. Address: Ground Floor Integrated Student Services Center (PPMT) Building, UI ,Depok Campus, 16424

#### Important Phone Numbers

UI Campus Salemba

Phone : +6221-330343, 3303455

Fax : +6221-330343

#### UI Campus Depok

Phone : +6221-7270020, 7270021, 7270022, 7270023, 7863460

Firefighters : 116

SAR : 55 021

#### Ambulance

RSCM : 118

Accidents : 119, 334 130

Police (on duty) : 525011

#### Police station

Central Jakarta : 3909922

North Jakarta : 491 017

South Jakarta : 7206011  
 West Jakarta : 5482371  
 East Jakarta : 8191478  
 Depok : 7520014

### 3.12. INTERNATIONAL JOURNAL OF TECHNOLOGY

International Journal of Technology (IJTech) is bi-annual international referred journal with the objectives to explore, develop, and elucidate the knowledge of engineering design and technology, to keep practitioners and researchers informed on current issues and best practices, as well as serving as a platform for the exchange of ideas, knowledge, and expertise among technology researchers and practitioners.

International Journal of Technology provides an opportunity to share detailed insights from different understandings and practices associated with technology. It provides an international forum for cross-disciplinary exchange of insights and ideas regarding value and practices for dissemination. International Journal of Technology will publish your work to international society of practitioners and researchers with interest in technology design and development from a wide variety of sectors.

Website: [www.ijtech.eng.ui.ac.id](http://www.ijtech.eng.ui.ac.id)

### 3.13. QUALITY IN RESEARCH (QiR) CONFERENCE

QiR Conference is a bi-annual international conference organized by FTUI since 1998. The 13th QiR was held in Yogyakarta from 25 - 28 June 2013. It was attended by over 400 participants from 16 different countries in the world. This conference provide a chance for students, be it undergraduate, master or doctoral program students, to present their research findings in front of an international audience. The 14th QiR will be held in August 2015. For more detail information on Qir, please visit: <http://qir.eng.ui.ac.id>.

### 3.14. INTERNATIONAL OFFICE

International Office is the university division dedicated to support the internationalization goals of the university and to handle international mobility involving the university and the international civitas academica. Their goal is to assist the international students and scholars handle their academic-related matters at Universitas Indonesia and to bridge Universitas Indonesia's civitas academica with overseas universities. Universitas Indonesia has a worldwide cooperation with various universities all over the world. These cooperations include not only academic but also research collaborations, giving the international access and exposure to its entire proud member.

The International Office of Universitas Indonesia provides various services such as: Bilateral Cooperation (University to University Cooperation), Regional Cooperation (International Associations & International Forums), Government to Government Cooperation (G to G), International Learning and Teaching, Student Exchange, Double Degree, Sandwich Program, Visiting Scholars, Study abroad, Scholarship Opportunities, International Research and Research Training, International Knowledge Transfer; are some of the services provided by the International Office. These opportunities are open for all university members from lecturers to students, be it in their Bachelor, Master or Ph.D program. Students can benefit from these programs in experiencing a once in a life time chance to study and understand different academic cultures in the world.

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 Twitter : @intofui

The cover features a central photograph of a large tree in a courtyard with a clock tower in the background. The image is overlaid with a semi-transparent blue triangle on the left and a semi-transparent grey rectangle in the center. The text 'UNDERGRADUATE PROGRAM' is centered in the grey area, flanked by two horizontal white lines. The entire composition is framed by blue and white geometric shapes at the top and bottom.

# UNDERGRADUATE PROGRAM



4.7. UNDERGRADUATE PROGRAM IN METALLURGY & MATERIALS ENGINEERING

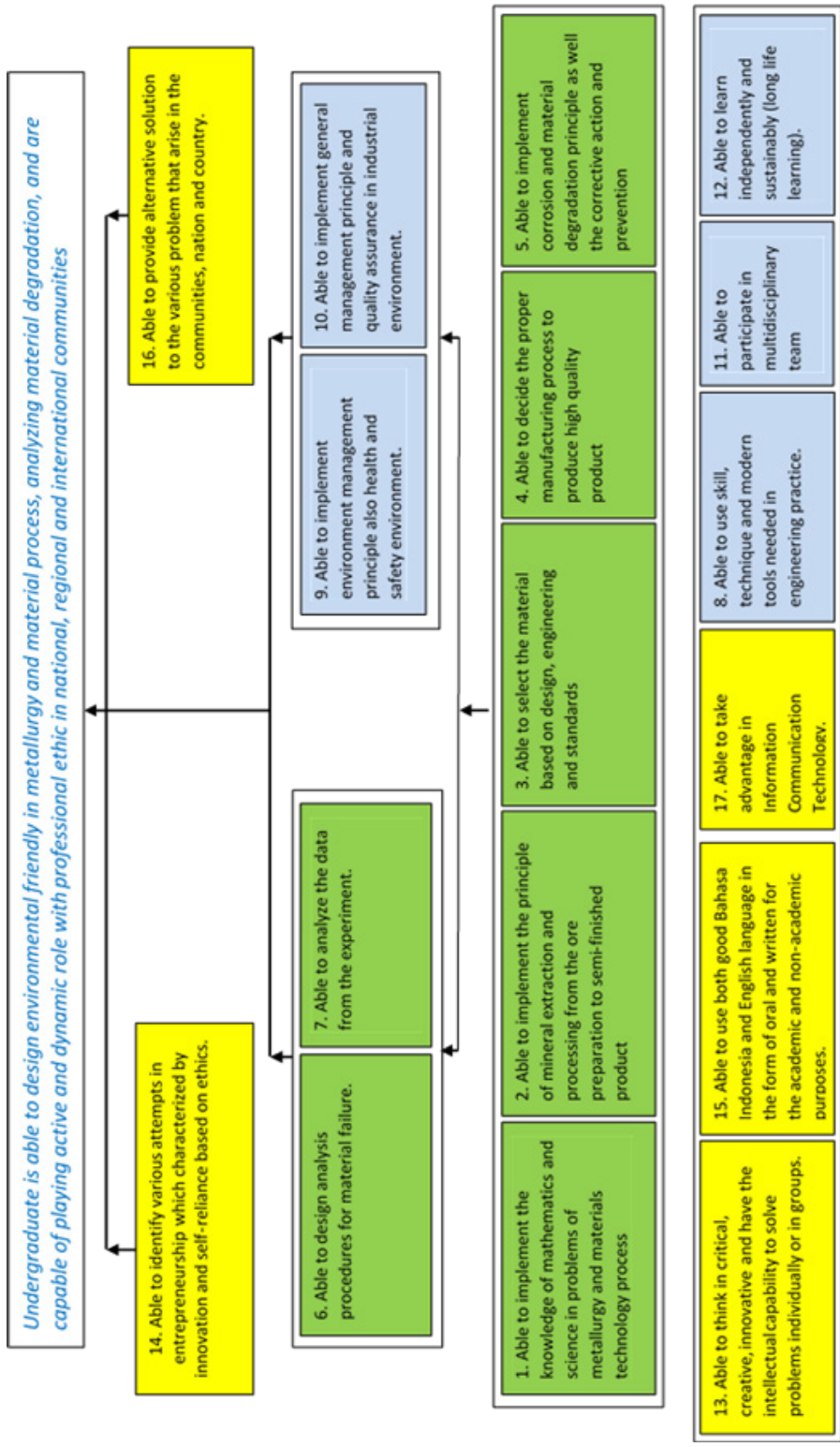
Program Specification

1	<b>Awarding Institution</b>		Universitas Indonesia Double degree : Universitas Indonesia & partner universities
2	<b>Teaching Institution</b>		Universitas Indonesia Double degree : Universitas Indonesia & partner universities
3	<b>Programme Title</b>		Undergraduate Program in Metallurgy and Materials Engineering
4	<b>Class</b>		Regular, Parallel, International
5	<b>Final Award</b>		Sarjana Teknik (S.T) Double Degree : Sarjana Teknik (S.T) and Bachelor of Engineering (B.Eng)
6	<b>Accreditation / Recognition</b>		BAN-PT : "A" Grade AUN-QA : Accredited
7	<b>Language(s) of Instruction</b>		Bahasa Indonesia and English
8	<b>Study Scheme (Full Time / Part Time)</b>		Full Time
9	<b>Entry Requirements</b>		High school graduate/equivalent, or Vocational/ Polytechnics graduate
10	<b>Study Duration</b>		Programmed for 4 Years
	Type of Semester	Number of semester	Number of weeks /semester
	Regular	8	17
	Short (optional)	3	8
11	<b>Graduate Profiles:</b>		Undergraduate is able to design environmental friendly in metallurgy and material process, analyzing material degradation, and are capable of playing active and dynamic role with professional ethic in national, regional and international communities
12	<b>Expected Learning Outcomes :</b>		<ol style="list-style-type: none"> <li>1. Able to implement the knowledge of mathematic and science in problems of metallurgy and materials technology process</li> <li>2. Able to implement the principle of mineral extraction and processing from the ore preparation to semi-finished product</li> <li>3. Able to select the material based on design, engineering and standards</li> <li>4. Able to decide the proper manufacturing process to produce high quality product</li> <li>5. Able to implement corrosion and material degradation principle as well the corrective action and prevention</li> <li>6. Able to design analysis procedures for material failure.</li> <li>7. Able to analyze the data from the experiment.</li> <li>8. Able to use skill, technique and modern tools needed in engineering practice.</li> <li>9. Able to implement environment management principle also health and safety environment.</li> <li>10. Able to implement general management principle and quality assurance in industrial environment.</li> <li>11. Able to participate in multidisciplinary team</li> <li>12. Able to learn independently and sustainably (long life learning).</li> <li>13. Able to think in critical, creative, innovative and have the intellectual capability to solve problems individually or in groups.</li> </ol>

12	14. Able to identify various attempts in entrepreneurship which characterized by innovation and self-reliance based on ethics. 15. Able to use both good bahasa Indonesia and English language in the form of oral and written for the academic and non academic purposes. 16. Able to provide alternative solution to the various problem that arise in the communities, nation and country. 17. Able to take advantage in Information Communication Technology.		
13	<b>Classification of Subjects</b>		
No	Classification	Credit Hours (SKS)	Percentage
i	Basic University Courses	20	14 %
ii	Basic Engineering Courses	22	15 %
iii	Compulsory Courses	85	59 %
iv	Elective Courses	10	7 %
v	Internship, Seminar, Skripsi, Projects	7	5 %
	Total	144	100 %
14	<b>Total Credit to Graduate</b>		<b>144 SKS</b>

**Employment Prospects**

Bachelor of Metallurgy and Materials Engineering graduates can work in various sectors, both private and government, like industry, automotive, manufacturing, heavy equipment, mining, material consultant, oil and gas, research and development institutions, academia, and others both within and abroad.



Semester 1	Semester 2	Semester 3	Semester 4	Semester 5	Semester 6	Semester 7	Semester 8
MPKT B	MPKT A	Basic Physics 2	Testing of Material	Industrial Management	Composite Technology	Capita Selecta	Final Project
Bahasa Inggris	Religion	Statistics & Probability	Polymer Chemistry	Non Ferrous Extractive Metallurgy	Ceramics Technology	Engineering Design of Product	Elective 3
Calculus 1	Sports / Art	Statics & Mechanics of Materials	Transport Phenomenon	Heat Treatment & Surface Engineering	Iron & Steel Making Process	Fracture Mechanics & Failure Analysis	Elective 4
Engineering Drawing	Linear Algebra	Thermodynamics of Materials	Physical Metallurgy 2	HSE	Corrosion & Protection of Metals	Internship	Elective 5
Introduction to Material Engineering	Basic Physics 1	Physical Metallurgy 1	Numerical Computation	Metal Manufacturing Process	Materials Joining	Seminar of Final Project Proposal	
Basic Chemistry	Calculus 2	ElectroChemistry	Mineral Processing	Polymer Technology	Extractive Metallurgy Laboratory	Elective 1	
Basic Chemistry Laboratory		Chemical Characterizations of Metal	Chemical Characterizations of Metal Lab.	Testing of Materials Laboratory	Corrosion & Protection of Metals Laboratory	Elective 2	
			Tech. of Microstructural Analysis	Tech. of Microstructural Analysis Lab.	Metal Manufacturing Process Lab.		
	General Subjects	Basic Engineering	Basic Skill	Engineering Skill	Final Stage	Elective Subject	

**COURSE STRUCTURE UNDERGRADUATE PROGRAM METALLURGY AND MATERIALS ENGINEERING**

KODE	MATA AJARAN	SUBJECT	SKS
<b>Semester 1</b>		<b>1st Semester</b>	
UIGE 6 0 0002	MPKT B	Integrated Character Building Subject B	6
UIGE 6 0 0003	Bahasa Inggris	English	3
ENGE 6 0 0001	Kalkulus 1	Calculus 1	3
ENGE 6 0 0009	Kimia Dasar	Basic Chemistry	2
ENMT 6 0 1 001	Menggambar Teknik	Engineering Drawing	2
ENMT 6 0 1 002	Pengantar Material Teknik	Introduction to Engineering Materials	2
ENMT 6 0 1 003	Praktikum Kimia Dasar	Basic Chemistry Laboratory	1
<b>Sub Total</b>			<b>19</b>
<b>Semester 2</b>		<b>2nd Semester</b>	
UIGE 6 0 0001	MPKT A	Integrated Character Building Subject A	6
UIGE 6 0 00010-15	Agama	Religious Studies	2
UIGE 6 0 00020-48	Olah Raga / Seni	Sport & Art	1
ENGE 6 0 0004	Aljabar Linier	Linear Algebra	4
ENGE 6 0 0002	Kalkulus 2	Calculus 2	3
ENGE 6 0 0005	Fisika Mekanika dan Panas	Physics (Mechanic & Heat)	3
ENGE 6 0 0006	Praktikum Fisika Mekanika dan Panas	Physics (Mechanic & Heat) Laboratory	1
<b>Sub Total</b>			<b>20</b>
<b>Semester 3</b>		<b>3rd Semester</b>	
ENGE 6 0 0007	Fisika Listrik, Magnet, Gelombang dan Optik	Physics (Electric, Magnet, Wave & Optic)	3
ENGE 6 0 0008	Praktikum Fisika Listrik, Magnet, Gelombang dan Optik	Physics (Electric, Magnet, Wave & Optic) Laboratory	1
ENGE 6 0 0010	Statistik & Probabilitas	Statistics & Probability	2
ENMT 6 0 3 004	Elektro Kimia	Electro-Chemistry	3
ENMT 6 0 3 005	Karakterisasi Kimia Material	Chemical Characterization of Materials	2
ENMT 6 0 3 006	Metalurgi Fisik 1	Physical Metallurgy 1	4
ENMT 6 0 3 007	Statika & Mekanika Material	Static & Mechanic of Materials	3
ENMT 6 0 3 008	Termodinamika Material	Thermodynamics of Materials	3
<b>Sub Total</b>			<b>21</b>
<b>Semester 4</b>		<b>4th Semester</b>	
ENMT 6 0 4 009	Analisis Struktur Material	Tech. of Microstructural Analysis	2
ENMT 6 0 4 010	Kimia Polimer	Polymer Chemistry	4
ENMT 6 0 4 011	Komputasi Numerik	Numerical Computation	2
ENMT 6 0 4 012	Metalurgi Fisik 2	Physical Metallurgy 2	3
ENMT 6 0 4 013	Pengolahan Mineral	Mineral Processing	4

METALLURGY & MATERIALS ENGINEERING

ENMT 6 0 4 014	Pengujian Material	Testing of Materials	2
ENMT 6 0 4 015	Peristiwa Perpindahan	Transport Phenomenon	3
ENMT 6 0 4 016	Praktikum Karakterisasi Kimia Material	Chemical Characterization of Materials Laboratory	1
		<b>Sub Total</b>	<b>21</b>
	<b>Semester 5</b>	<b>5th Semester</b>	
ENGE 6 0 0012	K3LL	Health, Safety & Environment	2
ENMT 6 0 5 017	Manajemen Industri	Industrial Management	2
ENMT 6 0 5 018	Metalurgi Ekstraksi Non Ferrous	Non Ferrous Extractive Metallurgy	3
ENMT 6 0 5 019	Perlakuan Panas & Rek. Permukaan	Heat Treatment & Surface Engineering	3
ENMT 6 0 5 020	Proses Manufaktur Logam	Metal Manufacturing Process	4
ENMT 6 0 5 021	Teknologi Polimer	Polymer Technology	3
ENMT 6 0 5 022	Praktikum Analisis Struktur Material	Tech. of Microstructural Analysis Laboratory	1
ENMT 6 0 5 023	Praktikum Pengujian Material	Testing of Materials Laboratory	1
		<b>Sub Total</b>	<b>19</b>
	<b>Semester 6</b>	<b>6th Semester</b>	
ENMT 6 0 6 024	Korosi & Proteksi Logam	Corrosion & Protection of Metals	3
ENMT 6 0 6 025	Penyambungan Material	Materials Joining	3
ENMT 6 0 6 026	Proses Pembuatan Besi Baja	Iron & Steel Making Process	2
ENMT 6 0 6 027	Teknologi Keramik	Ceramic Technology	3
ENMT 6 0 6 028	Teknologi Komposit	Composite Technology	3
ENMT 6 0 6 029	Praktikum Korosi & Proteksi Logam	Corrosion & Protection of Metals Laboratory	1
ENMT 6 0 6 030	Praktikum Metalurgi Ekstraksi	Extractive Metallurgy Laboratory	1
ENMT 6 0 6 031	Praktikum Proses Manufaktur Logam	Metal Manufacturing Process Laboratory	2
		<b>Sub Total</b>	<b>18</b>
	<b>Semester 7</b>	<b>7th Semester</b>	
ENMT 6 0 7 032	Disain Rekayasa Produk	Engineering Design of Products	3
ENMT 6 0 7 033	Kapita Selecta	Capita Selecta	2
ENMT 6 0 7 034	Mekanika Perpatahan & Analisis Kegagalan	Fracture Mechanics & Failure Analysis	4
ENMT 6 0 0 035	Kerja Praktek	Internship	2
ENMT 6 0 0 036	Seminar	Seminar of Final Project Proposal	1
	Pilihan 1	Elective 1	2
	Pilihan 2	Elective 2	2
		<b>Sub Total</b>	<b>16</b>
	<b>Semester 8</b>	<b>8th Semester</b>	
ENMT 6 0 0 037	Skripsi	Final Project	4
	Pilihan 3	Elective 3	2
	Pilihan 4	Elective 4	2
	Pilihan 5	Elective 5	2
		<b>Sub Total</b>	<b>10</b>
		<b>TOTAL</b>	<b>144</b>

**ELECTIVES**

KODE	MATA AJAR	SUBJECT	SKS
ENMT 6 0 7 938	Aditif Polimer	Polymer Additives	2
ENMT 6 0 7 939	Baja Khusus & Paduan Super	Special Steels & Super Alloys	2
ENMT 6 0 7 940	Bio Material	Bio Material	2
ENMT 6 0 7 941	Desain Pabrik Metalurgi	Metallurgical Plant Design	2
ENMT 6 0 7 942	Korosi Temperatur Tinggi	High Temperature Corrosion	2
ENMT 6 0 7 943	Material Elektronik	Electronic Materials	2
ENMT 6 0 7 944	Metodologi Penelitian	Research Methodology	2
ENMT 6 0 7 945	Pemrosesan Plastik	Plastic Processing	2
ENMT 6 0 7 946	Refraktori Material	Refractory Materials	2
ENMT 6 0 7 947	Sistem Manajemen Mutu	Quality Management Systems	2
ENMT 6 0 8 948	Analisis Pembentukan Logam	Analysis of Deformation	2
ENMT 6 0 8 949	Ekologi Industri	Industrial Ecology	2
ENMT 6 0 8 950	Korosi Pada Beton	Concrete Corrosion	2
ENMT 6 0 8 951	Material Energi	Energy Materials	2
ENMT 6 0 8 952	Metalurgi Ekstraksi Lanjut	Advanced Extractive Metallurgy	2
ENMT 6 0 8 953	Peralatan Mekanika Industri	Industrial Mechanic Equipment	2
ENMT 6 0 8 954	Rekayasa Permukaan Material Lanjut	Advanced Surface Engineering	2
ENMT 6 0 8 955	Standardisasi Material	Material Standardization	2
ENMT 6 0 8 956	Teknologi Daur Ulang Polimer	Polymer Recycling Technology	2
ENMT 6 0 8 957	Teknologi Karet	Rubber Technology	2
ENMT 6 0 8 958	Teknologi Nano	Nano Technology	2

**COURSE STRUCTURE INTERNATIONAL UNDERGRADUATE  
METALLURGY & MATERIALS ENGINEERING**

KODE	SUBJECT	SKS
<b>1st Semester</b>		
ENGE 6 1 0001	Calculus 1	3
UIGE 6 1 0002	Academic Writing	3
ENGE 6 1 0005	Physics (Mechanic & Heat)	3
ENGE 6 1 0006	Physics (Mechanic & Heat) Laboratory	1
ENGE 6 1 0009	Basic Chemistry	2
ENMT 6 1 1 001	Engineering Drawing	2
ENMT 6 1 1 002	Introduction to Engineering Materials	2
ENMT 6 1 1 003	Thermodynamics of Materials	3
ENMT 6 1 1 004	Basic Chemistry Laboratory	1
	<b>Sub Total</b>	<b>20</b>
<b>2nd Semester</b>		
ENGE 6 1 0004	Linear Algebra	4

ENGE 6 1 0002	Calculus 2	3
ENGE 6 1 0007	Physics (Electric, Magnet, Wave & Optic)	3
ENGE 6 1 0008	Physics (Electric, Magnet, Wave & Optic) Laboratory	1
ENGE 6 1 0010	Statistics & Probability	2
ENMT 6 1 2 005	Polymer Chemistry	4
ENMT 6 1 2 006	Transport Phenomenon	3
	<b>Sub Total</b>	<b>20</b>
<b>3rd Semester</b>		
ENGE 6 1 0012	Health, Safety & Environment	2
ENMT 6 1 3 007	Chemical Characterization of Materials	2
ENMT 6 1 3 008	Electro-Chemistry	3
ENMT 6 1 3 009	Heat Treatment & Surface Engineering	3
ENMT 6 1 3 010	Physical Metallurgy 1	4
ENMT 6 1 3 011	Polymer Technology	3
ENMT 6 1 3 012	Static & Mechanic of Materials	3
	<b>Sub Total</b>	<b>20</b>
<b>4th Semester</b>		
ENMT 6 1 4 013	Corrosion & Protection of Metals	3
ENMT 6 1 4 014	Iron & Steel Making Process	2
ENMT 6 1 4 015	Mineral Processing	4
ENMT 6 1 4 016	Numerical Computation	2
ENMT 6 1 4 017	Physical Metallurgy 2	3
ENMT 6 1 4 018	Tech. of Microstructural Analysis	2
ENMT 6 1 4 019	Testing of Materials	2
ENMT 6 1 4 020	Chemical Characterization of Materials Laboratory	1
ENMT 6 1 4 021	Corrosion & Protection of Metals Laboratory	1
	<b>Sub Total</b>	<b>20</b>
<b>5th Semester</b>		
UIGE 6 1 0004	Integrated Character Building Subject B	6
ENMT 6 1 5 022	Industrial Management	2
ENMT 6 1 5 023	Metal Manufacturing Process	4
ENMT 6 1 5 024	Non Ferrous Extractive Metallurgy	3
ENMT 6 1 5 025	Tech. of Microstructural Analysis Laboratory	1
ENMT 6 1 5 026	Testing of Materials Laboratory	1
	<b>Sub Total</b>	<b>17</b>
<b>6th Semester</b>		
UIGE 6 1 0001	Integrated Character Building Subject A	6
UIGE 6 1 0005-9	Religious Studies	2
UIGE 6 1 0003	Sport & Art	1
ENMT 6 1 6 027	Ceramic Technology	3
ENMT 6 1 6 028	Composite Technology	3
ENMT 6 1 6 029	Materials Joining	3
ENMT 6 1 6 030	Extractive Metallurgy Laboratory	1
ENMT 6 1 6 031	Metal Manufacturing Process Laboratory	2



	<b>Sub Total</b>	<b>21</b>
<b>7th Semester</b>		
ENMT 6 1 7 032	Capita Selecta	2
ENMT 6 1 7 033	Engineering Design of Products	3
ENMT 6 1 7 034	Fracture Mechanics & Failure Analysis	4
ENMT 6 1 0 035	Internship	2
ENMT 6 1 0 036	Seminar of Final Project Proposal	1
	Elective 1	2
	Elective 2	2
	<b>Sub Total</b>	<b>16</b>
<b>8th Semester</b>		
ENMT 6 1 0 037	Final Project	4
	Elective 3	2
	Elective 4	2
	Elective 5	2
	<b>Sub Total</b>	<b>10</b>
	<b>TOTAL</b>	<b>144</b>

**Curriculum of 2016 - Subjects Syllabus**  
**Bachelor Degree - Dept. of Metallurgy & Materials Engineering**

**ENMT 601001 - ENGINEERING DRAWING - (2 Credit Points)**

Illustration: Function and benefit of Engineering Drawing; SAP; Measurement and Evaluation; Introduction to drawing equipment; Basic definition of geometric, paper format, draw regulation, line, fill, line configuration, basic geometric form; Visualization geometric: Skew projection and isometric, function and line types, configuration geometric form; Orthogonal Projection: Projection standard, viewing concept, width display principle; Advanced orthogonal projection: Circle region concept, special region concept, trimming concept, display width, refraction.

Prerequisite: -

**ENMT 601002 - INTRODUCTION TO ENGINEERING MATERIALS - (2 Credit Points)**

(1) Types of engineering materials and their applications; (2) Structures of engineering materials; (3) Properties of material; (4) Manufacturing and Processing of Metallic Materials; (5) Steel and iron: production and properties; (6) Aluminium: production and properties; (7) Other non-ferrous alloys: production and properties; (8) Polymer: processing and properties; (9) Ceramic: processing and properties; (10) Composite: processing and properties

Prerequisite: -

**ENMT 601003 - BASIC CHEMISTRY LABORATORY - (1 Credit Point)**

Physical and chemical properties; Separation and purification of the substance; Identification of alkali metal ions, alkaline earth, ammonium, sulfate, iodide, bromide and nitrate; acid-base titration; metal and acid reaction; Water crystals

Prerequisite: -

**ENMT 603004 - ELECTRO-CHEMISTRY - (3 Credit Points)**

Basic concepts and applications of electrochemistry, and conductivity solution, Faraday's law, and their application. Electrode electrochemical cell (definition, potential, equation Nernst, electrical double layer, the polarization, the measurement of potential, free energy and electrode potential, equilibrium potential), the reference electrode, Construction Pourbaix diagram and its application. Electrochemical kinetics, electrode reaction speed, mixed potential theory, Evans-diagram, the mixed-potential diagram

Prerequisite: -

**ENMT 603005 - CHEMICAL CHARACTERIZATION OF MATERIAL - (2 Credit Points)**

Review of structure and physicochemical characteristics of materials, concept of material analysis (qualitative and quantitative), principal of analysis instrument from spectroscopy method (UV/VIS, FTIR, XRF, Spark Emission) and thermal method (TGA, DSC/DTA, MFI and Vicat), material characterization strategy.

Prerequisite: -

**ENMT 603006 - PHYSICAL METALLURGY 1 - (4 Credit Points)**

(1) Definition of crystal; (2) Crystal lattice; (3) Unit cell; (4) Bravais lattice; (5) Miller index for planes and direction; (6) Stereographic projection; (7) Crystal symmetry; (8) Formation of crystal; (9) Identification of crystal; (10) Crystal defects: point defects, line defects (dislocations), edge dislocations, screw dislocations, burgers vector, movement of dislocations, energy of dislocation, dislocations in FCC, BCC and HCP structures, planar defects; (11) Fatigue and Fracture of Materials; (12) Creep of Materials; (13) Strengthening Mechanism: strain (work) hardening, grain boundary strengthening, solid solution strengthening, precipitation (two-phase) strengthening, steel alloys strengthening, composite strengthening, study case in materials strengthening.

Prerequisite: -

**ENMT 603007 - STATIC & MECHANIC OF MATERIALS - (3 Credit Points)**

General principle of mechanics, Vector and forces, Equilibrium points, Resultant of forces, Structure analysis, Center of gravity and centroid, Moment inertia, Internal forces, Friction. The concept of stress strain, Relation of stress and strain in axial loading, Twisting, Buckling, Transversals loading, Stress analysis, Design of shaft and beam, Beam deflection, Structural joints, Column and thick cylinder, Energy method.

Prerequisite: -

**ENMT 603008 - THERMODYNAMICS OF MATERIALS - (3 Credit Points)**

Definition of thermodynamics, first, second, and third law of thermodynamics, statistical interpretation of entropy, auxiliary functions, heat capacity, enthalpy and entropy, phase equilibrium in a component, gas and solution behavior, free energy, binary system composition, reaction of pure condensation phase and gas phase, equilibrium reaction of a system in a solution component

Prerequisite: -

**ENMT 604009 - TECH. OF MICROSTRUCTURAL ANALYSIS - (2 Credit Points)**

Techniques of microstructure analysis, Phase formation and general characteristic of material structures, Microstructure of steel; stable and metastable phases and the formation and mechanism, Microstructure of non-ferrous alloys; aluminum, copper, titanium, Macrostructure, Sampling techniques, Samples preparation, Observation techniques with optical and electron microscopes, Special measurements; micro-hardness, coating thickness, roughness, Quantitative metallography; grain size, volume fraction of phases and precipitates.

Prerequisite: Physical Metallurgy 1

**ENMT 604010 - POLYMER CHEMISTRY - (4 Credit Points)**

Fundamentals of organic chemistry (bonding atom and molecule, polar molecules, free radicals, the nomenclature of organic compounds, isomer, conjugation and resonance). Reaction types of organic compounds, addition reactions, nucleophilic and electrophilic substitution, elimination, rearrangement, and radical reaction mechanism. Basic Properties of Polymer Chemistry

Prerequisite: -

**ENMT 604011 - NUMERICAL COMPUTATION - (2 Credit Points)**

Introduction to models, types of models, basics of Matlab, array in Matlab, if and switch selection, loop in Matlab, function and m-file in Matlab, linear equation, Taylor expansion method, Euler, differential equation, basic of solid works, solid modeling, basics of simulink, first and second order simulink

Prerequisite: -

**ENMT 604012 - PHYSICAL METALLURGY 2 - (3 Credit Points)**

(1) Concept of Equilibrium: single component system, binary component system, the phase rule, binary phase diagrams; (2) Fe-Fe<sub>3</sub>C Phase Diagram; (3) Ternary Equilibrium: ternary system representation, ternary system containing 2 phase, ternary system containing 3 phase; (4) Diffusion in Materials: atomic mechanism of diffusion, interstitial diffusion, substitutional diffusion; (5) Crystal Interfaces and Microstructure: interfacial free energy, grain boundary, interphase interfaces in solids, interface migration; (6) Solidification: nucleation in pure metals, growth of a pure solid, solidification of alloy, solidification of ingots and castings, solidification of fusion welds, rapid solidification; (7) Diffusional Transformation in Solids: homogeneous and heterogeneous nucleation in solids, precipitate growth, transformation kinetics, eutectoid transformation, ordering transformation; (8) Diffusionless Transformation in Solids: theories of martensite nucleation, martensite growth, tempering of ferrous martensite, martensite transformation in nonferrous metals, case study in diffusionless transformation

Prerequisite: Thermodynamics of Materials

**ENMT 604013 - MINERAL PROCESSING - (4 Credit Points)**

Understanding mineralogy, classification of minerals, mineral properties, mineral that has economic

value. Terminology and basic concepts of processing mineral / ore, potential sources of mineral / ore that can be processed in a technically and economically, the processes of size reduction (comminution): The process of crushing, screening process, grinding process, the classification process, process of separation/concentration: Gravity concentration: Concentration Heavy Jigging Flowing Film, Media Separation, Flotation process, Magnetic Separation, High Tension Separation, Dewatering and Thickening process

Prerequisite: Physical Metallurgy 1

**ENMT 604014 - TESTING OF MATERIALS - (2 Credit Points)**

Introduction to material testing, Review of mechanical behavior of materials, Data analysis and presentation of test results, Testing procedures, Testing machine and instruments, Standardization of materials testing, Destructive testing (tensile, compression, shear, fatigue, stress relaxation, and wear), Non-destructive (visual, penetrant, ultrasonic, radiography, eddy current and magnetic particle)

Prerequisite: Physical Metallurgy 1

**ENMT 604015 - TRANSPORT PHENOMENON - (3 Credit Points)**

Mass transfer, Fluid flow concept, Laminar flow, momentum conservation, Turbulent flow, Enthalpy & heat transfer, Solid & liquid diffusion mass transport

Prerequisite: Thermodynamics of Materials

**ENMT 604016 - CHEMICAL CHARACTERIZATION OF MATERIAL LABORATORY - (1 Credit Point)**

Quantitative analysis of organic and anorganic matter using titrimetry method

Prerequisite: Chemical Characterization of Material

**ENMT 605017 - INDUSTRIAL MANAGEMENT - (2 Credit Points)**

Introduction to industrial management, organization and management functions, theories and techniques of decision-making, management of production / operations, the strategic decisions of products and processes, location and layout, management and control of stocks (inventory), R & D, project management, QC and productivity, management production practices, marketing and industrial management, HR management, IT and manufacturing industry, manufacturing industry in Indonesia

Prerequisite: -

**ENMT 605018 - NON-FERROUS EXTRACTIVE METALLURGY - (3 Credit Points)**

Basic principles of extractive metallurgy (pyrometallurgy, hydrometallurgy and electrometallurgy). Process/treatment process of ore to be extracted. Leaching method of oxide and sulfide ores, Bayer process, Al, Au leaching by cyanidation (Leaching; precipitation techniques; ion exchange; solvent extraction; reverse osmosis). Electrometallurgy (Electro winning and electro refining). Molten salt electro winning. Hall process. Electro winning of Mg, Ti. Secondary metals. Obtaining metals from scrap and secondary sources by using pyro, hydro, and electrometallurgy. Pyrometallurgy, mineral separation, slag, blast furnace, raw materials, reactions, material balance, iron ore, roasting, smelting, refining of Sn, Ni, Cu, Zn, Pb.

Prerequisite: Electro-chemistry, Mineral Processing

**ENMT 605019 - HEAT TREATMENT & SURFACE ENGINEERING - (3 Credit Points)**

Definition of heat treatment, phase transformation and microstructure, TTT and CCT diagram, the influence of heating and cooling rate, stable and metastable microstructure, hardenability, the influence of alloying element, hardening, softening, temper brittleness, distortion and its prevention, carburization, nitro-carburizing, nitriding, boronizing, non-ferrous heat treatment, various heat-treating furnace and its atmosphere, deviation in heat treatment process, special heat treatment, case study of heat treatment and surface engineering

Prerequisite: Physical Metallurgy 1

**ENMT 605020 - METAL MANUFACTURING PROCESS - (4 Credit Points)**

The forming of metals as a part of design process and manufacture; fundamentals of metal casting (mould, molten metal, solidification), mould (sand, ceramic, metal), pouring system (pattern, riser, pressure and unpressure, chill) and its simulation, solidification of cast iron and aluminum, liquid treatment for ferrous metals (inoculation, Mg treatment) and non-ferrous (modifier, grain refiner), various methods of casting, casting defect; common principle of solid forming of a metal, techniques of metal forming through: pressing, forging, rolling, extrusion, wire drawing, sheet metal forming; thermo-mechanical processing (TMP). General principle of powder metallurgy, powder fabrication and mechanism of powder forming, powder characteristics and characterization, mechanical alloying, pre-compaction process, compaction, precursor characteristic, sintering and powder consolidation, full density processing, sintering equipment and related aspects, application of powder metallurgy products

Prerequisite: Physical Metallurgy 1

**ENMT 605021 - POLYMER TECHNOLOGY - (3 Credit Points)**

Relationship of structure and behaviour of polymer molecule, polymer material characteristics (thermal, chemical, mechanic, optic and electrical), fabrication process stages (formulation, continuous & discontinuous manufacturing, product finalization) on thermoplastic, thermosetting and rubber product, polymer raw material formulation, case study of polymer product in packaging, automotive, electronic and construction application

Prerequisite: Polymer Chemistry

**ENMT 605022 - TECH. OF MICROSTRUCTURAL ANALYSIS LABORATORY - (1 Credit Point)**

Metallographic sample preparation (techniques of cutting, grinding, polishing and etching), microstructural analysis techniques of metal (ferrous and non-ferrous) with an optical microscope

Prerequisite: Tech. of Microstructural Analysis

**ENMT 605023 - TESTING OF MATERIALS LABORATORY - (1 Credit Points)**

Tensile test, Compressive test, Micro and Macro Hardness test, Impact Test, Wear Test

Prerequisite: Testing of Materials

**ENMT 606024 - CORROSION & PROTECTION OF METALS - (3 Credit Points)**

Principles of corrosion, kinetics of corrosion, polarization, passivation, measurement of corrosion rate, metallurgical aspects, corrosion tests, forms of corrosion, high temperature corrosion, cathodic protection, anodic protection, coating, inhibition, materials selection and design, monitoring and inspection, analysis of corrosion driven-damage, standards related to corrosion

Prerequisite: Electro-Chemistry

**ENMT 606025 - MATERIALS JOINING - (3 Credit Points)**

Principles of various material joining and its classification, adhesive bonding, mechanical joining, methods of welding: fusion welding (electric arc), electrical resistance welding, pressure welding (solid state welding), other welding process (EBW, laser welding, thermit welding, underwater welding), soldering and brazing, design of joint and welding symbol, welding metallurgy: carbon steel, low alloy steel, stainless steel, concrete steel, non ferrous, WPS and welding standards and code, weld defect and its prevention, control of joint and its testing

Prerequisite: Physical Metallurgy 1, Testing of Materials

**ENMT 606026 - IRON & STEEL MAKING PROCESS - (2 Credit Points)**

Classification and the development of steel (iron ores, reductor, etc.) and their preparatory process, thermodynamics and kinetics of iron and steel making process, blast furnace reduction of iron ores, direct reduction (hylsa, midrex, rotary kiln SL-RN, rotary hearth), smelting reduction, desulfurization, deoxidation, dephosphorisation, degassing, steel making in EAF (Electric Arc Furnace) and BOF (Basic Oxygen Furnace), secondary metallurgy process, continuous casting, hot and cold rolling, special steel making

Prerequisite: Mineral Processing

**ENMT 606027 - CERAMIC TECHNOLOGY - (3 Credit Points)**

Introduction to ceramics (general), crystal structure, glass structure, phase diagrams, phase transformations. Properties of ceramics: thermal, optical, mechanical, electrical and magnetic fields, as well as the nature dielektris. Manufacture of ceramic technology and applications: conventional ceramic (aluminum-silicate; clay, glaze); cement and concrete; glass and advanced ceramics (advanced ceramics). The processes for modern ceramics, ceramic thin film, ceramic for field application of mechanical, electronic, optical and magnetic. -Based ceramic matrix composites. Refractory ceramics. Refractory raw materials, types of refractories: refractory system Aluminium - silica, silica refractories, refractory magnesite, chromite refractories, refractory carbon, special refractories. Manufacture of refractories, the use of refractory metals in the industry and others, as well as the failure mechanism of refractory.

Prerequisite: Physical Metallurgy 2

**ENMT 606028 - COMPOSITE TECHNOLOGY - (3 Credit Points)**

The concept, definition and clarification of the composite, matrix and reinforcement type for composites, metal matrix composite, polymer matrix composite, ceramic matrix composite, fiber composite nature. Reinforced fibers and Whiskers, the rule of mixtures, the interface in composite materials, interfacial area, Interfacial Wettability, interfacial bonding

Prerequisite: Polymer Technology

**ENMT 606029 - CORROSION & PROTECTION OF METALS LABORATORY - (1 Credit Point)**

Corrosion cells, corrosion potential measurement of selected metals, polarization of stainless steel, cathodic protection, surface treatment.

Prerequisite: -

**ENMT 606030 - EXTRACTIVE METALLURGY LABORATORY - (1 Credit Point)**

Metals extraction test and electrometallurgy (e.g. Electroplating, froth flotation)

Prerequisite: Non Ferrous Extractive Metallurgy

**ENMT 606031 - METAL MANUFACTURING PROCESS LABORATORY - (2 Credit Points)**

(1) Sand particle size distribution, water content calculation, additive substance (bentonite) content in mould, sand flowability, relation of water and additive content in sand with permeability, shear and compressive strength of sand, (2) utilization of simulation software in calculation and design of casting, (3) Design of inlet and riser, mould making from patterns, making of the core of the mould, melting and pouring of molten metal to the mould, analysis of casting defect, analysis of casting product related to the alloying element and casting process. (4) Solid silinder forging, (5) Sheet metal rolling, (6) Sheet metal forming which includes non-simulative testing (tensile testing for n and r value), and simulative testing (stretching and deep-drawing, LDH and LDR)

Prerequisite: Metal Manufacturing Process

**ENMT 607032 - ENGINEERING DESIGN OF PRODUCT - (3 Credit Points)**

Introduction to Engineering Design, total design activity, group dynamics and design management, problem identification and design specification, creativity and the conception of design, modeling, optimallisation, materials and process selection, design communication and presentation.

Prerequisite: Polymer Technology, Composite Technology, Ceramic Technology, Iron & Steel Making Process

**ENMT 607033 - CAPITA SELECTA - (2 Credit Points)**

Specific topics that have not been included in Subjects and supplied by external resource persons which is experienced in industry

Prerequisite: Metal Manufacturing Process, Corrosion & Protection of Metals

**ENMT 607034 - FRACTURE MECHANICS & FAILURE ANALYSIS - (4 Credit Points)**

Aspects of failure engineering and its analysis, sources/factors contributing the material's failure, explanation of failure factors, types of fractures, stress system and residual stress, theories of fracture mechanics and introduction to the risk-based inspection, failure due to: fatigue, creep,

wear, brittleness, heat behavior, residual stress, corrosion and environment, case study.  
Prerequisite: Physical Metallurgy 1, Testing of Materials, Tech. of Microstructural Analysis, Corrosion & Protection of Metals

**ENMT 600035 - INTERNSHIP - (2 Credit Points)**

Specify the job objectives in the proposal; Implement an internship at a site that has been approved and in accordance with its specificity; Study and describe the process of technical work, quality control, project management, project specifications, engineering drawings and other aspects; Identify the problem related to the technical work, quality control, project management, project specifications, engineering drawings and other aspects; Conduct problems that occur at each stage of the project; Determine ways or solutions to overcome the problems associated with the project learned; Prepare a final report includes project description, existing problems and problem solving  
Prerequisite: Student has obtained minimum of 100 credits

**ENMT 600036 - SEMINAR OF FINAL PROJECT PROPOSAL - (1 Credit Points)**

Final assignment writing guide including initial research, abstract writing guide, research methodology, type of references, discussion, also conclusion. To make scientific paper from existing final report which then be presented according to certain journal term or final assignment proposal presentation.  
Prerequisite: Student has obtained minimum of 105 credits

**ENMT 600037 - FINAL PROJECT - (4 Credit Points)**

Implementation/application of various lectures taken by students on integration in a research to solve a problem in metallurgy and material engineering field. The research result is presented in a form of scientific report and presented in front of the judging lecturers.  
Prerequisite: Student has obtained minimum of 125 credits

**ELECTIVES**

**ENMT 607938 - POLYMER ADDITIVES - (2 Credit Points)**

Strategic role of polymer compounding industries, additives type and functions, modification of polymer product according to market, mixing theory in polymer base material, polymer compounding fabrication process for thermoplastic and rubber, success evaluation for polymer compounding, dispersion test / observation and additives distribution in plastic pellet product  
Prerequisite: Polymer Technology

**ENMT 607939 - SPECIAL STEELS & SUPER ALLOYS - (2 Credit Points)**

Classification, alloying elements and microstructures of special steels and super alloys which include: stainless steels (ferritic, austenitic, duplex, martensitic, and precipitation hardened), heat resistant steels, wear resistant steels, tool steels, Ni and Co based steels.  
Prerequisite: Iron & Steel Making Process

**ENMT 607940 - BIOMATERIALS - (2 Credit Points)**

Overview of Biomaterials and Their Use in Medical Devices, Physical and Mechanical Requirements for Medical Device Materials, Metallic Materials, Corrosion of Metallic Implants and Prosthetic Devices, Failure Analysis of Metallic Orthopedic Implants, Ceramic Materials, Polymeric Materials, Adhesives, Coatings, Biomaterials for Dental Applications, Tarnish and Corrosion of Dental Alloys, Friction and Wear of Dental Materials  
Prerequisite: Statics & Mechanics of Materials, Corrosion & Protection of Metals

**ENMT 907941 - METALLURGICAL PLANT DESIGN - (2 Credit Points)**

Risk-based approach to plan design, process economic and selection, business case, site selection, project development, managing technology risk, custom designed equipment, sustainability in plant design, design for safety, plant layout and logistics, project implementation  
Prerequisite: Non Ferrous Extractive Metallurgy, Iron & Steel Making Process

**ENMT 607942 - HIGH TEMPERATURE CORROSION - (2 Credit Points)**

Metal oxidation reaction thermodynamics, Ellingham diagram, oxide structure, type-n and type-p oxidation, Pilling-Bedworth ratio, oxide growth mechanism and rate, high temperature corrosion in specific environment (hot corrosion, boiler, carburization, thermal cycle), protection method (material selection, high temperature resistant alloy, coating / surface engineering)

Prerequisite: Corrosion & Protection of Metals

**ENMT 607943 - ELECTRONIC MATERIALS - (2 Credit points)**

Elementary concepts of electron theory (wave - particle duality, free electrons, nearly free electrons, band structure, insulators - conductors - semiconductors). Modern theory of solids (band theory of solids, density of states, Boltzmann and Fermi-Dirac statistics, electron effective mass and Fermi energy). Electrical conduction in materials (classical electron theory, quantum mechanical considerations, magnetism, superconductivity, dielectrics and insulator, thermoelectric phenomena). Semiconductors (intrinsic and extrinsic semiconductors, degenerate semiconductors, recombination and minority carrier junction, Schottky junctions and Ohmic contacts, semiconductor devices)

Prerequisite: Transport Phenomenon

**ENMT 607944 - RESEARCH METHODOLOGY - (2 Credit Points)**

Scientific understanding, research method, problem specification, hypothesis, literature study, data collection and processing, elaboration of research proposal and scientific work presentation

Prerequisite: -

**ENMT 607945 - PLASTIC PROCESSING - (2 Credit Points)**

Introduction of polymer and its product, polymer characteristics related to process, polymer rheology, polymer equipment (injection molding, blow molding, calendaring, thermoforming), polymer composites (reinforcing process, laminating process)

Prerequisite: Polymer Technology

**ENMT 607946 - REFRACTORY MATERIALS - (2 Credit Points)**

Introduction to refractory materials. Types of refractory materials (acid, basic, neutral refractory). Shape of refractory materials. Industrial application.

Prerequisite: Ceramic Technology

**ENMT 607947 - QUALITY MANAGEMENT SYSTEMS - (2 Credit Points)**

General introduction, ISO 9004 system approach and its connection with environment and safety, quality management system requirement, internal audit, correction and preventive procedure

Prerequisite: Statistic & Probability

**ENMT 608948 - ANALYSIS OF DEFORMATION - (2 Credit Points)**

Review of Stress and Strain, Energy-Balance Analysis, Force-Balance Analysis, Upper Bound Analysis, Slip Line Field Analysis, Finite Element Analysis, Circle Grid Analysis, Distortion and Deformations Analysis

Prerequisite: Statics & Mechanics of Materials, Metal Manufacturing Process, Engineering Design of Products

**ENMT 608949 - INDUSTRIAL ECOLOGY - (2 Credit Points)**

Views on Industrial Ecology, Life-Cycle Assessment: Method Basics, Environmental Evaluation and Advanced Methods, Aggregate Materials Flows, Environmental Policy Strategies

Prerequisite: Non Ferrous Extractive Metallurgy, Iron & Steel Making Process

**ENMT 608950 - CONCRETE CORROSION - (2 Credit Points)**

Cement material characteristics (types, water ratio, porosity, permeability), transport process of cement (water content and diffusion), cement degradation (sea water attack, acid attack), corrosion mechanism in cement, electrochemistry aspects, carbonated corrosion, chloride corrosion, stray current corrosion, hydrogen corrosion, corrosion protection (inhibitor, surface engineering, cathodic protection, inspection, monitoring, repair)



Prerequisite: Corrosion & Protection of Metals

**ENMT 608951 - ENERGY MATERIAL - (2 Credit Points)**

Introduction to energy material, photovoltaic material, dye-sensitized solar cell, lithium ion battery, copper nanoparticles, carbon nanotubes, applications and manufacturing process

Prerequisite: Polymer Technology, Composite Technology, Ceramic Technology

**ENMT 608952 - ADVANCED EXTRACTIVE METALLURGY - (2 Credit Points)**

Waste characterization for raw material, innovation in hydrometallurgy and pyrometallurgy for energy efficient process, metal recycle process, by-product process and utilization, mineral processing from tailing, metal recovery from red mud and water sludge, updated technology for metal recycle process.

Prerequisite: Non Ferrous Extractive Metallurgy

**ENMT 608953 - INDUSTRIAL MECHANIC EQUIPMENTS - (2 Credit Points)**

Code and Standard, Pipes and Pipe Fittings, Special Items, Valves, Pipe Connection to Process Equipments (Tanks, Pressure Vessels, Heat Exchangers, Columns, Pumps, Compressors), Piping System for Oil, Gas, LNG, Geothermal, Water, Chemical, Piping System for Instrumentation, Piping and Instrument Diagram (P & ID), Plot Plan, Isometric, Cross Section, Pipe Fabrication Drawings, Process Pipes, Utility Pipes, Onshore and Offshore

Prerequisite: Metal Manufacturing Process, Corrosion & Protection of Metals

**ENMT 608954 - ADVANCED SURFACE ENGINEERING - (2 Credit Points)**

Fundamental of surface engineering, conventional surface engineering, advanced surface engineering practices, surface coatings and surface modifications, advanced topics on characterizations for thin film

Prerequisite: Heat Treatment & Surface Engineering

**ENMT 608955 - MATERIAL STANDARDIZATION - (2 Credit points)**

Introduction to material standard. Types of material standard. Industrial standard of materials.

Prerequisite: -

**ENMT 608956 - PLASTIC RECYCLING TECHNOLOGY - (2 Credit Points)**

National and international regulation on polymer recycling, polymer material cycle, classification of polymer industry in Indonesia, ecology and polymer product, basic principal for recycling, selection of polymer recycle methods, physical and chemical engineering of polymer recycle product, case study of polymer recycle (PET, PP, PE, PS, Styrofoam, PVC, polyacrylate, thermoplastic, ABS, rubber, thermoset)

Prerequisite: Polymer Technology

**ENMT 608957 - RUBBER TECHNOLOGY - (2 Credit points)**

Introduction, types and characteristics of rubber raw material and products, additives for rubber product, manufacturing process and equipment for rubber product, testing methods and applications of rubber products

Prerequisite: Polymer Technology

**ENMT 608958 - NANO TECHNOLOGY - (2 Credit Points)**

Scope and definition of nanotechnology, physical and chemical of solid surface, nanostructures (zero, one and two dimensional), special nanomaterials, fabrication processes (lithography, nanolithography, soft lithography, assembly), nanomaterial characterizations (physical, chemical and structural) and applications (MEMS, DNA chips, photonics, crystal)

Prerequisite: Polymer Technology, Composite Technology, Ceramic Technology

**Curriculum of 2016 - Subjects Syllabus**  
**Bachelor Degree International**  
**Dept. of Metallurgy & Materials Engineering**

**ENMT 611001 - ENGINEERING DRAWING - (2 Credit Points)**

Illustration: Function and benefit of Engineering Drawing; SAP; Measurement and Evaluation; Introduction to drawing equipment; Basic definition of geometric, paper format, draw regulation, line, field, line configuration, basic geometric form; Visualization geometric: Skew projection and isometric, function and line types, configuration geometric form; Orthogonal Projection: Projection standard, viewing concept, width display principle; Advanced orthogonal projection: Circle region concept, special region concept, trimming concept, display width, refraction.

Prerequisite: -

**ENMT 611002 - INTRODUCTION TO ENGINEERING MATERIALS - (2 Credit Points)**

(1) Types of engineering materials and their applications; (2) Structures of engineering materials; (3) Properties of material; (4) Manufacturing and Processing of Metallic Materials; (5) Steel and iron: production and properties; (6) Aluminium: production and properties; (7) Other non-ferrous alloys: production and properties; (8) Polymer: processing and properties; (9) Ceramic: processing and properties; (10) Composite: processing and properties

Prerequisite: -

**ENMT 611003 - THERMODYNAMICS OF MATERIALS - (3 Credit Points)**

Definition of thermodynamics, first, second, and third law of thermodynamics, statistical interpretation of entropy, auxiliary functions, heat capacity, enthalpy and entropy, phase equilibrium in a component, gas and solution behavior, free energy, binary system composition, reaction of pure condensation phase and gas phase, equilibrium reaction of a system in a solution component

Prerequisite: -

**ENMT 611004 - BASIC CHEMISTRY LABORATORY - (1 Credit Point)**

Physical and chemical properties; Separation and purification of the substance; Identification of alkali metal ions, alkaline earth, ammonium, sulfate, iodide, bromide and nitrate; acid-base titration; metal and acid reaction; Water crystals

Prerequisite: -

**ENMT 612005 - POLYMER CHEMISTRY - (4 Credit Points)**

Fundamentals of organic chemistry (bonding atom and molecule, polar molecules, free radicals, the nomenclature of organic compounds, isomer, conjugation and resonance). Reaction types of organic compounds, addition reactions, nucleophilic and electrophilic substitution, elimination, rearrangement, and radical reaction mechanism. Basic Properties of Polymer Chemistry

Prerequisite: -

**ENMT 612006 - TRANSPORT PHENOMENON - (3 Credit Points)**

Mass transfer, Fluid flow concept, Laminar flow, momentum conservation, Turbulent flow, Enthalpy & heat transfer, Solid & liquid diffusion mass transport

Prerequisite: Thermodynamics of Materials

**ENMT 613007 - CHEMICAL CHARACTERIZATION OF MATERIAL LABORATORY - (1 Credit Point)**

Quantitative analysis of organic and anorganic matter using titrimetry method

Prerequisite: Chemical Characterization of Material

**ENMT 613008 - ELECTRO-CHEMISTRY - (3 Credit Points)**

Basic concepts and applications of electrochemistry, and conductivity solution, Faraday's law, and their application. Elektrode electrochemical cell (definition, potential, equation Nerst, electrical double layer, the polarization, the measurement of potential, free energy and electrode potential,

equilibrium potential), the reference electrode, Construction Pourbaix diagram and its application. Electrochemical kinetics, electrode reaction speed, mixed potential theory, Evans-diagram, the mixed-potential diagram

Prerequisite: -

**ENMT 613009 - HEAT TREATMENT & SURFACE ENGINEERING - (3 Credit Points)**

Definition of heat treatment, phase transformation and microstructure, TTT and CCT diagram, the influence of heating and cooling rate, stable and metastable microstructure, hardenability, the influence of alloying element, hardening, softening, temper brittleness, distortion and its prevention, carburization, nitro-carburizing, nitriding, boronizing, non-ferrous heat treatment, various heat-treating furnace and its atmosphere, deviation in heat treatment process, special heat treatment, case study of heat treatment and surface engineering

Prerequisite: Physical Metallurgy 1

**ENMT 613010 - PHYSICAL METALLURGY 1 - (4 Credit Points)**

(1) Definition of crystal; (2) Crystal lattice(3) Unit cell; (4) Bravais lattice; (5) Miller index for planes and direction; (6) Stereographic projection; (7) Crystal symmetry; (8) Formation of crystal; (9) Identification of crystal; (10) Crystal defects: point defects, line defects (dislocations), edge dislocations, screw dislocations, burgers vector, movement of dislocations, energy of dislocation, dislocations in FCC, BCC and HCP structures, planar defects; (11) Fatigue and Fracture of Materials; (12) Creep of Materials; (13) Strengthening Mechanism: strain (work) hardening, grain boundary strengthening, solid solution strengthening, precipitation (two-phase) strengthening, steel alloys strengthening, composite strengthening, study case in materials strengthening.

Prerequisite: -

**ENMT 613011 - POLYMER TECHNOLOGY - (3 Credit Points)**

Relationship of structure and behaviour of polymer molecule, polymer material characteristics (thermal, chemical, mechanic, optic and electrical), fabrication process stages (formulation, continuous & discontinuous manufacturing, product finalization) on thermoplastic, thermosetting and rubber product, polymer raw material formulation, case study of polymer product in packaging, automotive, electronic and construction application

Prerequisite: Polymer Chemistry

**ENMT 613012 - STATIC & MECHANIC OF MATERIALS - (3 Credit Points)**

General principle of mechanics, Vector and forces, Equilibrium points, Resultant of forces, Structure analysis, Center of gravity and centroid, Moment inertia, Internal forces, Friction. The concept of stress strain, Relation of stress and strain in axial loading, Twisting, Buckling, Transversals loading, Stress analysis, Design of shaft and beam, Beam deflection, Structural joints, Column and thick cylinder, Energy method.

Prerequisite: -

**ENMT 614013 - CORROSION & PROTECTION OF METALS - (3 Credit Points)**

Principles of corrosion, kinetics of corrosion, polarization, passivation, measurement of corrosion rate, metallurgical aspects, corrosion tests, forms of corrosion, high temperature corrosion, cathodic protection, anodic protection, coating, inhibition, materials selection and design, monitoring and inspection, analysis of corrosion driven-damage, standards related to corrosion

Prerequisite: Electro-Chemistry

**ENMT 614014 - IRON & STEEL MAKING PROCESS - (2 Credit Points)**

Classification and the development of steel (iron ores, reductor, etc.) and their preparatory process, thermodynamics and kinetics of iron and steel making process, blast furnace reduction of iron ores, direct reduction (hylsa, midrex, rotary kiln SL-RN, rotary hearth), smelting reduction, desulfurization, deoxidation, dephosphorisation, degassing, steel making in EAF (Electric Arc Furnace) and BOF (Basic Oxygen Furnace), secondary metallurgy process, continuous casting, hot and cold rolling, special steel making

Prerequisite: Mineral Processing

**ENMT 614015 - MINERAL PROCESSING - (4 Credit Points)**

Understanding mineralogy, classification of minerals, mineral properties, mineral that has economic value. Terminology and basic concepts of processing mineral / ore, potential sources of mineral / ore that can be processed in a technically and economically, the processes of size reduction (comminution): The process of crushing, screening process, grinding process, the classification process, process of separation/concentration: Gravity concentration: Concentration Heavy Jigging Flowing Film, Media Separation, Flotation process, Magnetic Separation, High Tension Separation, Dewatering and Thickening process

Prerequisite: Physical Metallurgy 1

**ENMT 614016 - NUMERICAL COMPUTATION - (2 Credit Points)**

Introduction to models, types of models, basics of Matlab, array in Matlab, if and switch selection, loop in Matlab, function and m-file in Matlab, linear equation, Taylor expansion method, Euler, differential equation, basic of solid works, solid modeling, basics of simulink, first and second order simulink

Prerequisite: -

**ENMT 614017 - PHYSICAL METALLURGY 2 - (3 Credit Points)**

(1) Concept of Equilibrium: single component system, binary component system, the phase rule, binary phase diagrams; (2) Fe-Fe<sub>3</sub>C Phase Diagram; (3) Ternary Equilibrium: ternary system representation, ternary system containing 2 phase, ternary system containing 3 phase; (4) Diffusion in Materials: atomic mechanism of diffusion, interstitial diffusion, substitutional diffusion; (5) Crystal Interfaces and Microstructure: interfacial free energy, grain boundary, interphase interfaces in solids, interface migration; (6) Solidification: nucleation in pure metals, growth of a pure solid, solidification of alloy, solidification of ingots and castings, solidification of fusion welds, rapid solidification; (7) Diffusional Transformation in Solids: homogeneous and heterogeneous nucleation in solids, precipitate growth, transformation kinetics, eutectoid transformation, ordering transformation; (8) Diffusionless Transformation in Solids: theories of martensite nucleation, martensite growth, tempering of ferrous martensite, martensite transformation in nonferrous metals, case study in diffusionless transformation

Prerequisite: Thermodynamics of Materials

**ENMT 614018 - TECH. OF MICROSTRUCTURAL ANALYSIS - (2 Credit Points)**

Techniques of microstructure analysis, Phase formation and general characteristic of material structures, Microstructure of steel; stable and metastable phases and the formation and mechanism, Microstructure of non-ferrous alloys; aluminum, copper, titanium, Macrostructure, Sampling techniques, Samples preparation, Observation techniques with optical and electron microscopes, Special measurements; micro-hardness, coating thickness, roughness, Quantitative metallography; grain size, volume fraction of phases and precipitates.

Prerequisite: Physical Metallurgy 1

**ENMT 614019 - TESTING OF MATERIALS - (2 Credit Points)**

Introduction to material testing, Review of mechanical behavior of materials, Data analysis and presentation of test results, Testing procedures, Testing machine and instruments, Standardization of materials testing, Destructive testing (tensile, compression, shear, fatigue, stress relaxation, and wear), Non-destructive (visual, penetrant, ultrasonic, radiography, eddy current and magnetic particle)

Prerequisite: Physical Metallurgy 1

**ENMT 614020 - CHEMICAL CHARACTERIZATION OF MATERIAL LABORATORY - (1 Credit Point)**

Quantitative analysis of organic and anorganic matter using titrimetry method

Prerequisite: Chemical Characterization of Material

**ENMT 614021 - CORROSION & PROTECTION OF METALS LABORATORY - (1 Credit Point)**

Corrosion cells, corrosion potential measurement of selected metals, polarization of stainless steel, cathodic protection, surface treatment.

Prerequisite: -

**ENMT 615022 - INDUSTRIAL MANAGEMENT - (2 Credit Points)**

Introduction to industrial management, organization and management functions, theories and techniques of decision-making, management of production / operations, the strategic decisions of products and processes, location and layout, management and control of stocks (inventory), R & D, project management, QC and productivity, management production practices, marketing and industrial management, HR management, IT and manufacturing industry, manufacturing industry in Indonesia

Prerequisite: -

**ENMT 615023- METAL MANUFACTURING PROCESS - (4 Credit Points)**

The forming of metals as a part of design process and manufacture; fundamentals of metal casting (mould, molten metal, solidification), mould (sand, ceramic, metal), pouring system (pattern, riser, pressure and unpressure, chill) and its simulation, solidification of cast iron and aluminum, liquid treatment for ferrous metals (inoculation, Mg treatment) and non-ferrous (modifier, grain refiner), various methods of casting, casting defect; common principle of solid forming of a metal, techniques of metal forming through: pressing, forging, rolling, extrusion, wire drawing, sheet metal forming; thermo-mechanical processing (TMP). General principle of powder metallurgy, powder fabrication and mechanism of powder forming, powder characteristics and characterization, mechanical alloying, pre-compaction process, compaction, precursor characteristic, sintering and powder consolidation, full density processing, sintering equipment and related aspects, application of powder metallurgy products

Prerequisite: Physical Metallurgy 1

**ENMT 615024 - NON-FERROUS EXTRACTIVE METALLURGY - (3 Credit Points)**

Basic principles of extractive metallurgy (pyrometallurgy, hydrometallurgy and electrometallurgy). Process/treatment process of ore to be extracted. Leaching method of oxide and sulfide ores, Bayer process, Al, Au leaching by cyanidation (Leaching; precipitation techniques; ion exchange; solvent extraction; reverse osmosis). Electrometallurgy (Electro winning and electro refining). Molten salt electro winning. Hall process. Electro winning of Mg, Ti. Secondary metals. Obtaining metals from scrap and secondary sources by using pyro, hydro, and electrometallurgy. Pyrometallurgy, mineral separation, slag, blast furnace, raw materials, reactions, material balance, iron ore, roasting, smelting, refining of Sn, Ni, Cu, Zn, Pb.

Prerequisite: Electro-chemistry, Mineral Processing

**ENMT 615025 - TECH. OF MICROSTRUCTURAL ANALYSIS LABORATORY - (1 Credit Point)**

Metallographic sample preparation (techniques of cutting, grinding, polishing and etching), microstructural analysis techniques of metal (ferrous and non-ferrous) with an optical microscope

Prerequisite: Tech. of Microstructural Analysis

**ENMT 615026 - TESTING OF MATERIALS LABORATORY - (1 Credit Points)**

Tensile test, Compressive test, Micro and Macro Hardness test, Impact Test, Wear Test

Prerequisite: Testing of Materials

**ENMT 616027 - CERAMIC TECHNOLOGY - (3 Credit Points)**

Introduction to ceramics (general), crystal structure, glass structure, phase diagrams, phase transformations. Properties of ceramics: thermal, optical, mechanical, electrical and magnetic fields, as well as the nature dielektris. Manufacture of ceramic technology and applications: conventional ceramic (aluminum-silicate; clay, glaze); cement and concrete; glass and advanced ceramics

(advanced ceramics). The processes for modern ceramics, ceramic thin film, ceramic for field application of mechanical, electronic, optical and magnetic. -Based ceramic matrix composites. Refractory ceramics. Refractory raw materials, types of refractories: refractory system Aluminium - silica, silica refractories, refractory magnesite, chromite refractories, refractory carbon, special refractories. Manufacture of refractories, the use of refractory metals in the industry and others, as well as the failure mechanism of refractory.

Prerequisite: Physical Metallurgy 2

#### **ENMT 616028 - COMPOSITE TECHNOLOGY - (3 Credit Points)**

The concept, definition and clarification of the composite, matrix and reinforcement type for composites, metal matrix composite, polymer matrix composite, ceramic matrix composite, fiber composite nature. Reinforced fibers and Whiskers, the rule of mixtures, the interface in composite materials, interfacial area, Interfacial Wettability, interfacial bonding

Prerequisite: Polymer Technology

#### **ENMT 616029 - MATERIALS JOINING - (3 Credit Points)**

Principles of various material joining and its classification, adhesive bonding, mechanical joining, methods of welding: fusion welding (electric arc), electrical resistance welding, pressure welding (solid state welding), other welding process (EBW, laser welding, thermit welding, underwater welding), soldering and brazing, design of joint and welding symbol, welding metallurgy: carbon steel, low alloy steel, stainless steel, concrete steel, non ferrous, WPS and welding standards and code, weld defect and its prevention, control of joint and its testing

Prerequisite: Physical Metallurgy 1, Testing of Materials

#### **ENMT 616030 - EXTRACTIVE METALLURGY LABORATORY - (1 Credit Point)**

Metals extraction test and electrometallurgy (e.g. Electroplating, froth flotation)

Prerequisite: Non Ferrous Extractive Metallurgy

#### **ENMT 616031 - METAL MANUFACTURING PROCESS LABORATORY - (2 Credit Points)**

(1) Sand particle size distribution, water content calculation, additive substance (bentonite) content in mould, sand flowability, relation of water and additive content in sand with permeability, shear and compressive strength of sand, (2) utilization of simulation software in calculation and design of casting, (3) Design of inlet and riser, mould making from patterns, making of the core of the mould, melting and pouring of molten metal to the mould, analysis of casting defect, analysis of casting product related to the alloying element and casting process. (4) Solid silinder forging, (5) Sheet metal rolling, (6) Sheet metal forming which includes non-simulative testing (tensile testing for n and r value), and simulative testing (stretching and deep-drawing, LDH and LDR)

Prerequisite: Metal Manufacturing Process Metal

#### **ENMT 616032 - CAPITA SELECTA - (2 Credit Points)**

Specific topics that have not been included in Subjects and supplied by external resource persons which is experienced in industry

Prerequisite: Metal Manufacturing Process, Corrosion & Protection of Metals

#### **ENMT 616033 - ENGINEERING DESIGN OF PRODUCT - (3 Credit Points)**

Introduction to Engineering Design, total design activity, group dynamics and design management, problem identification and design specification, creativity and the conception of design, modeling, optimallisation, materials and process selection, design communication and presentation.

Prerequisite: Polymer Technology, Composite Technology, Ceramic Technology, Iron & Steel Making Process

#### **ENMT 616034 - FRACTURE MECHANICS & FAILURE ANALYSIS - (4 Credit Points)**

Aspects of failure engineering and its analysis, sources/factors contributing the material's failure, explanation of failure factors, types of fractures, stress system and residual stress, theories of fracture mechanics and introduction to the risk-based inspection, failure due to: fatigue, creep, wear, brittleness, heat behavior, residual stress, corrosion and environment, case study.

Prerequisite: Physical Metallurgy 1, Testing of Materials, Tech. of Microstructural Analysis, Corrosion



& Protection of Metals

**ENMT 616035 - INTERNSHIP - (2 Credit Points)**

Specify the job objectives in the proposal; Implement an internship at a site that has been approved and in accordance with its specificity; Study and describe the process of technical work, quality control, project management, project specifications, engineering drawings and other aspects; Identify the problem related to the technical work, quality control, project management, project specifications, engineering drawings and other aspects; Conduct problems that occur at each stage of the project; Determine ways or solutions to overcome the problems associated with the project learned; Prepare a final report includes project description, existing problems and problem solving  
Prerequisite: Student has obtained minimum of 100 credits

**ENMT 616036 - SEMINAR OF FINAL PROJECT PROPOSAL - (1 Credit Points)**

Final assignment writing guide including initial research, abstract writing guide, research methodology, type of references, discussion, also conclusion. To make scientific paper from existing final report which then be presented according to certain journal term or final assignment proposal presentation.

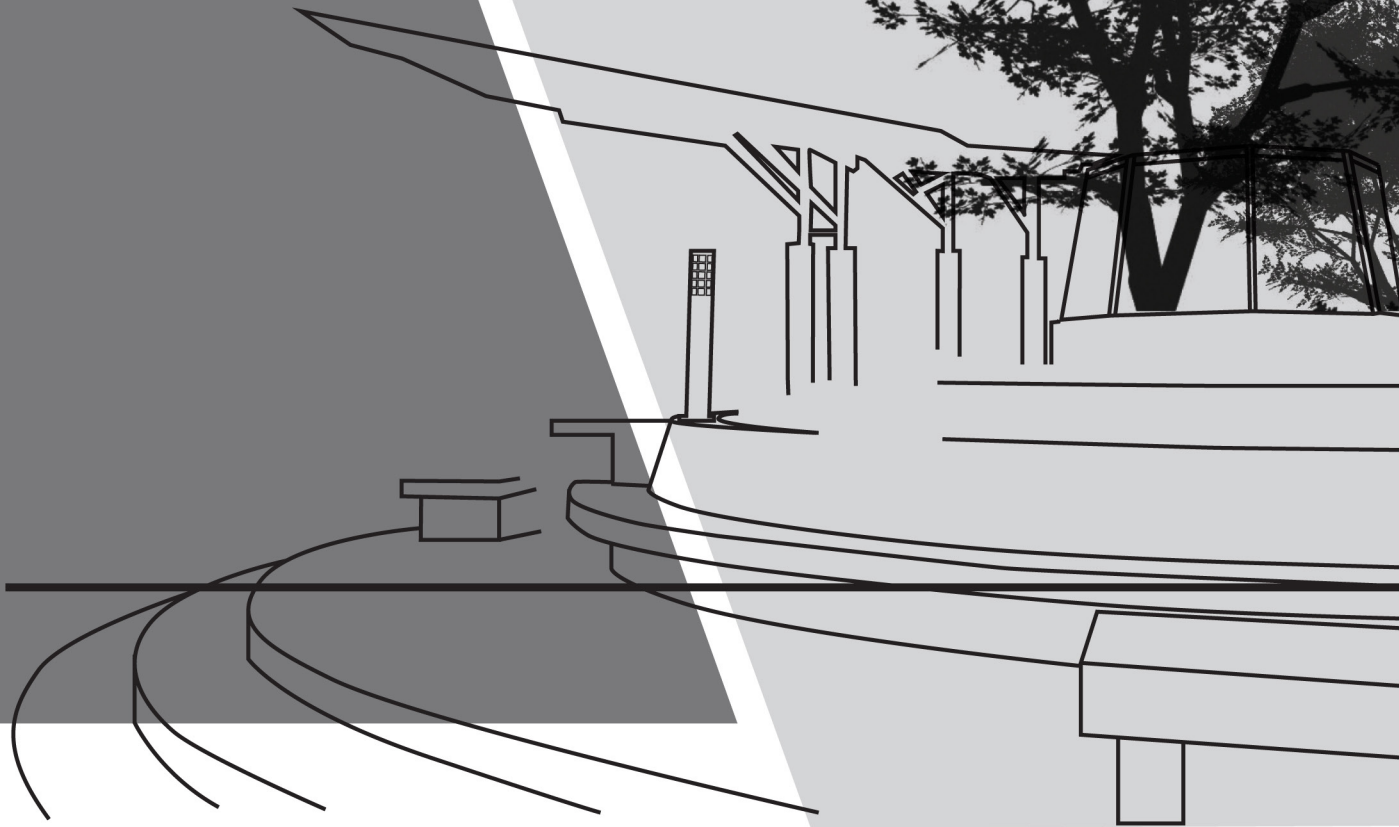
Prerequisite: Student has obtained minimum of 105 credits

**ENMT 616037 - FINAL PROJECT - (4 Credit Points)**

Implementation/application of various lectures taken by students on integration in a research to solve a problem in metallurgy and material engineering field. The research result is presented in a form of scientific report and presented in front of the judging lecturers.

Prerequisite: Student has obtained minimum of 125 credits

MASTER  
PROGRAM





6.4. MASTER PROGRAM IN METALLURGY AND MATERIALS ENGINEERING

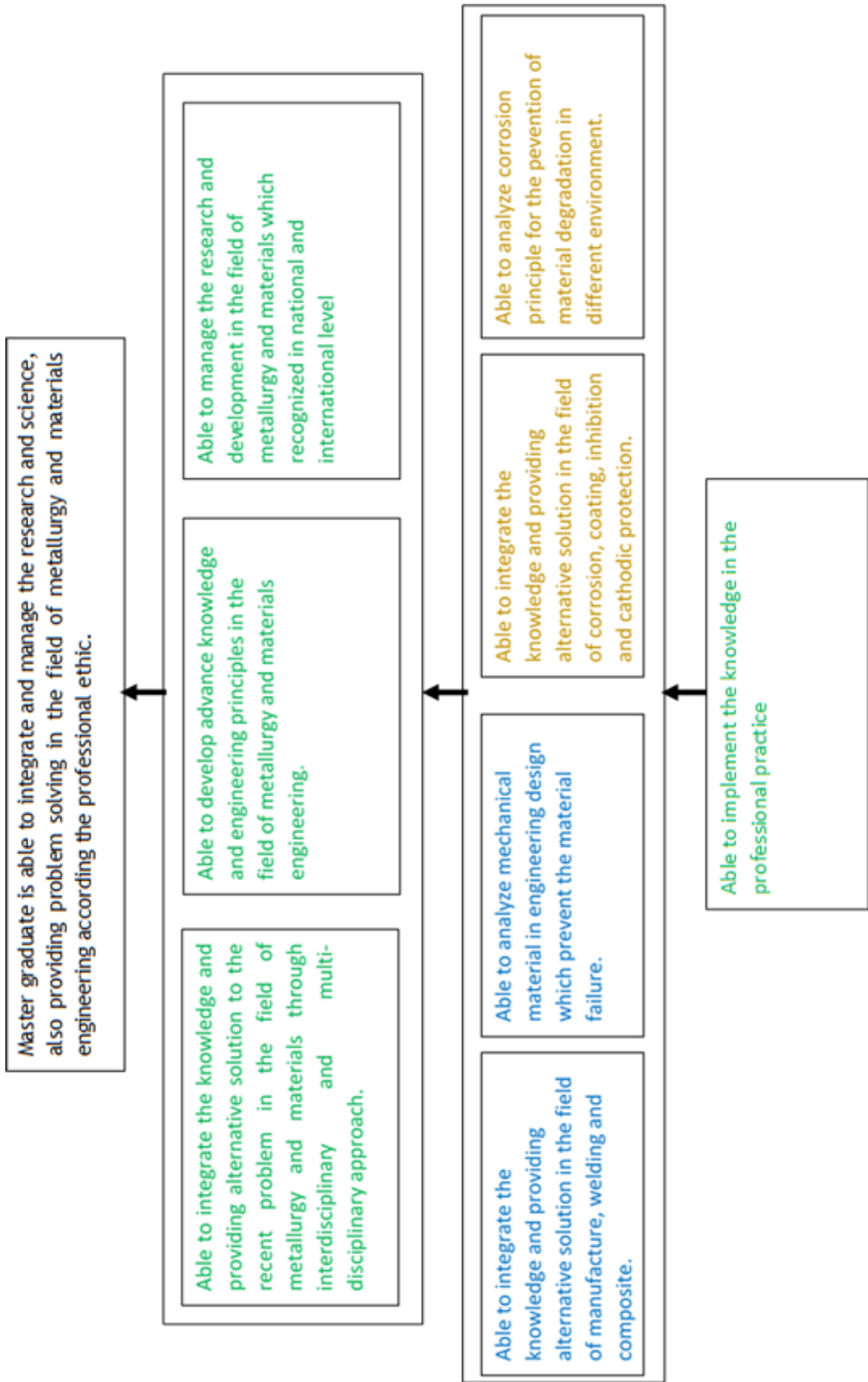
Program Specification

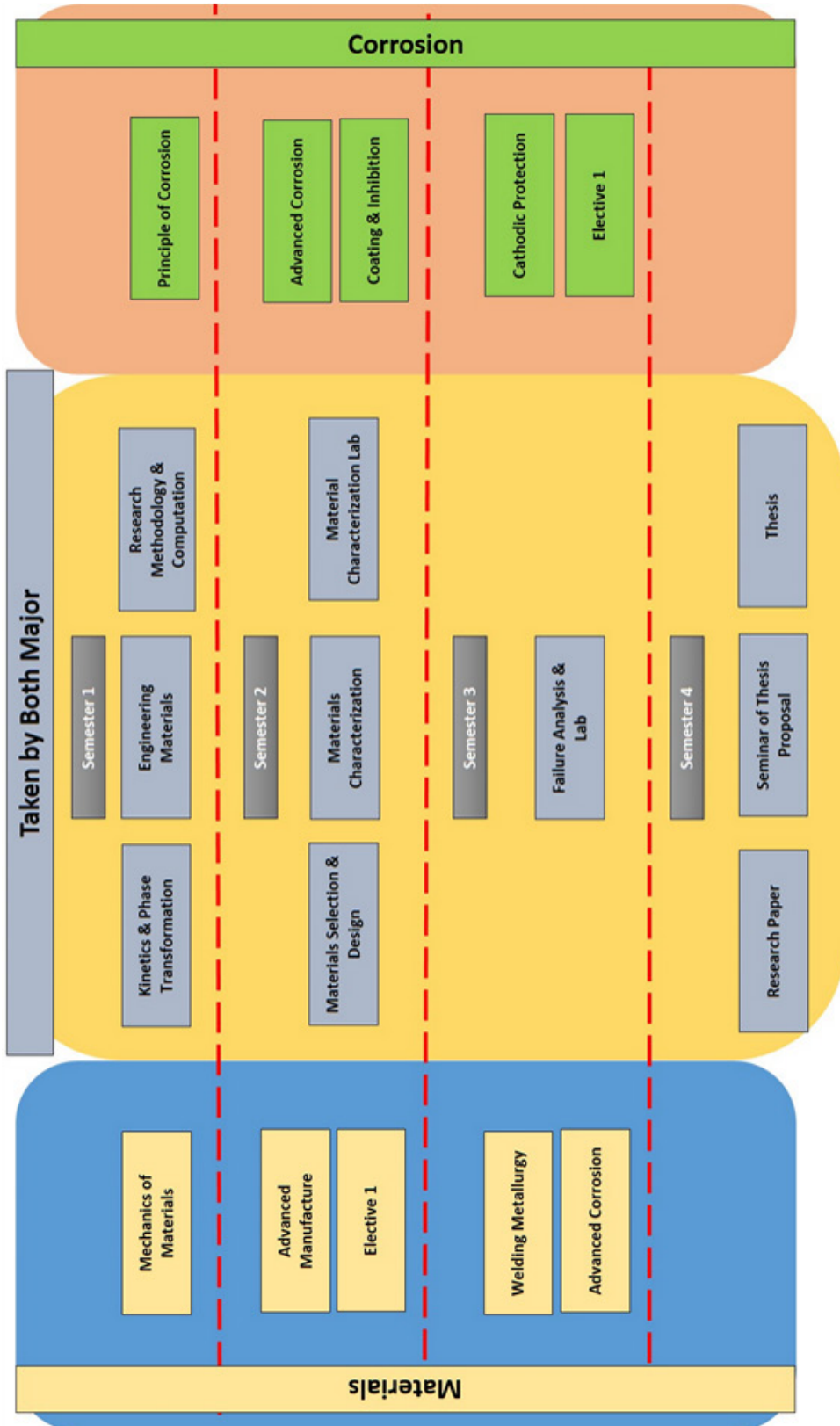
1	<b>Degree Awarding Institution</b>		Universitas Indonesia Double degree : Universitas Indonesia & partner universities
2	<b>Organizing Institution</b>		Universitas Indonesia Double degree : Universitas Indonesia & partner universities
3	<b>Name of Study Program</b>		Graduate Program in Metallurgy and Materials Engineering
4	<b>Type of class</b>		Regular, Special
5	<b>Awarding Degree</b>		Magister Teknik (M.T.) Double Degree: Magister Teknik (M.T.) dan Master of Engineering (M.Eng.)
6	<b>Grade of Accreditation</b>		BAN-PT: "A" Grade AUN-QA: Accredited
7	<b>Literate Language</b>		Bahasa (Indonesia) and English
8	<b>Scheme of Learning (Full-time / Part-time)</b>		Full-time
9	<b>Study requirements</b>		Bachelor Graduate (S1) / equivalent
10	<b>Term of Study</b>		Programmed for 2 years
	Type of Semester	Number of semester	Number of weeks /semester
	Regular	4	17
	Short (optional)	1	8
11	<b>Specialization:</b> Materials Specialization Corrosion Specialization		
12	<b>Graduate profile:</b> Master graduate is able to integrate and manage the research and science, also providing problem solving in the field of metallurgy and materials engineering according the professional ethic.		
13	<b>List of Competence Graduates:</b>		
	1. Able to develop advance knowledge and engineering principles in the field of etallurgy and materials engineering.		
	2. Able to implement the knowledge in the profesional practice		
	3. Able to integrate the knowledge and providing alternative solution to the recent problem in the field of metallurgy and materials through interdisplinary and multidisplinary approach.		
	4. Able to manage the research and development in the field of metallurgy and materials which recognized in national and international level		
	5. Able to analyze mechanical material in engineering design which prevent the material failure.		
	6. Able to integrate the knowledge and providing alternative solution in the field of manufacture, welding and composite.		
	7. Able to analyze corrosion principle for the pevention of material degradation in different environment.		
	8. Able to integrate the knowledge and providing alternative solution in the field of corrosion, coating, inhibition and cathodic protection.		
14	<b>Course Composition</b>		
No	Types of Courses	(SKS)	Percentage
i	Compulsory Courses	33	75 %
ii	Elective Courses	3	7 %
iii	Seminar and Thesis	8	18 %
		44	100 %
14	<b>Total Credits to Graduate</b>		44 SKS

With the increasing development of technology-based industrial materials, the Department of Metallurgical Engineering & Material continuously seek to improve the curriculum in accordance with technological developments. Metallurgy and Materials engineering is a discipline that studies the production, characterization, materials selection and engineering design (engineering materials). Functionally, the role of a master engineering such as designing new materials / modification, develop new manufacturing processes / modifications, material selection, structural characterization (nano, micro and macro) and properties of the material and analyzing the event of a failure in its use.

Master's program curriculum in the field of metallurgical engineering and materials designed to provide opportunities for learners are able to design, select and develop metallurgical processes and material technology, new materials characterization / modifications and be able to control the damage / degradation of material due to media and the environment through corrosion protection techniques and material selection. To that end, the curriculum syllabus 2012 master program FTUI metallurgical engineering and materials designed for 2 (two) types of specialization are:

1. Specialisation of Materials (Materials)
2. Specialisation Corrosion (Corrosion)





COURSE STRUCTURE MASTER METALLURGY & MATERIALS ENGINEERING

Kode MK 2016	Mata Kuliah	Subject	SKS			
			Kekhususan / Major		Fast Track	
	Semester 1	1st Semester	Manu-faktur	Ko-rosi	Manu-faktur	Ko-rosi
ENMT 8 0 1 001	Kinetika & Transformasi Fasa	Kinetics & Phase Transformation	3	3		
ENMT 8 0 1 002	Material Teknik	Engineering Materials	2	2		
ENMT 8 0 1 003	Metode Penelitian & Komputasi	Research & Computational Methods	3	3		
ENMT 8 0 1 104	Mekanika Material	Mechanics of Materials	3		3	
ENMT 8 0 1 205	Prinsip Korosi	Principles of Corrosion		3		3
	<b>Sub Total</b>		<b>11</b>	<b>11</b>	<b>3</b>	<b>3</b>
	Semester 2	2nd Semester				
ENMT 8 0 2 006	Disain & Pemilihan Material	Design & Selection of Materials	3	3		
ENMT 8 0 2 007	Karakterisasi Material	Material Characterization	3	3	3	3
ENMT 8 0 2 008	Praktikum Karakterisasi Material	Material Characterization Laboratory	1	1	1	1
ENMT 8 0 2 109	Manufaktur Lanjut	Advanced Manufacture	3		3	
ENMT 8 0 2 210	Korosi Lanjut	Advanced Corrosion		3		3
ENMT 8 0 2 211	Pelapisan & Inhibisi	Coating & Inhibition of Materials		3		3
	Pilihan	Elective	3			
	<b>Sub Total</b>		<b>13</b>	<b>13</b>	<b>7</b>	<b>10</b>
	Semester 3	3rd Semester				
ENMT 8 0 3 012	Analisa Kerusakan & Lab.	Failure Analysis + Laboratory	4	4		
ENMT 8 0 3 113	Metallurgi Las	Welding Metallurgy	3		3	
ENMT 8 0 3 114	Komposit Lanjut	Advanced Composites	3		3	
ENMT 8 0 3 215	Proteksi Katodik	Cathodic Protection		3		3
	Pilihan	Elective		3		
	<b>Sub Total</b>		<b>10</b>	<b>10</b>	<b>6</b>	<b>3</b>
	Semester 4	4th Semester				
ENMT 8 0 0 016	Makalah Penelitian	Research Journal	2	2	2	2
ENMT 8 0 0 017	Seminar Proposal Tesis	Seminar of Thesis Proposal	2	2	2	2
ENMT 8 0 0 018	Tesis	Thesis	6	6	6	6
	<b>Sub Total</b>		<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>
	<b>TOTAL</b>		<b>44</b>	<b>44</b>	<b>26</b>	<b>26</b>

## ELECTIVES

KODE	MATA AJAR	SUBJECT	SKS
ENMT 8 0 3 919	Manajemen Proyek	Project Management	3
ENMT 8 0 3 920	Material Elektronik	Electronic Material	3
ENMT 8 0 3 921	Material Turunan Polimer	Polymer Derivative Materials	3
ENMT 8 0 3 922	RBI & Integrity	RBI & Integrity	3
ENMT 8 0 4 923	Manufaktur Lanjut Polimer	Advanced Polymer Manufacture	3
ENMT 8 0 4 924	Metalurgi Ekstraksi Lanjut	Advanced Extractive Metallurgy	3
ENMT 8 0 4 925	Rekayasa Permukaan Material Lanjut	Advanced Surface Treatment	3
ENMT 8 0 4 926	Teknologi Manufaktur Polimer	Polymer Manufacture Tehcnology	3
ENMT 8 0 4 927	Teknologi Nano	Nano Technology	3

Curriculum of 2016 - Subjects Syllabus  
Master Degree - Dept. of Metallurgy & Materials Engineering

**ENMT 801001 - KINETICS & PHASE TRANSFORMATION- (3 Credit Points)**

Review on Thermodynamics and Phase Equilibrium: Single Component System, Binary Component System, The Phase Rule, Binary Phase Diagrams, Reactions in the solid state; Fe-Fe<sub>3</sub>C Phase Diagram; Ternary System Representation, Ternary System containing 2 phase; Diffusion in Materials: Atomic mechanism of diffusion, Interstitial diffusion, Substitutional diffusion, Tracer diffusion in binary alloys, Diffusion in multiphase binary system, Journal review; Crystal Interface and Microstructure: Interfacial free energy, Grain boundary, Interphase interfaces in solids, Interface migration, Morphology of precipitates, Case study in Crystal Interface; Solidification: Nucleation in pure metals, Growth of pure solid, Cellular and dendritic solidification, Solidification of alloy, Application of solidification theory in casting and welding, Solidification during quenching from the melts, Case study; diffusional Transformation in Solids: Homogeneous and heterogeneous nucleation in solids, Precipitate growth, Transformation kinetics, Eutectoid transformation, Ordering transformation, Case study; (8) Diffusionless Transformation in Solids: Theories of martensite nucleation, Martensite growth, Tempering of ferrous martensite, Martensite transformation in nonferrous metals, Spinodal transformation, Case study in Diffusionless transformation

**ENMT 801002 - ENGINEERING MATERIALS - (2 Credit Points)**

Fundamental theories of materials including theories of atom, atomic bonding, bonding system; crystal structures; material structures and properties; ferrous material selection: classification designation and specifications of steel, low alloy steel, heat treatable carbon steel, and low alloy steel; selection of tool steels, stainless steels, cast irons; non-ferrous material selection (Al, Ti, Mg, Ni, and their alloys); shape memory alloys (smart materials); inorganic materials: ceramics and glasses, mechanical behaviour of ceramics; polymer materials, selection of plastics, polymerisation and composite materials.

**ENMT 801003 - RESEARCH AND COMPUTATIONAL METHODS - (3 Credit Points)**

Scientific understanding, research method, problem specification, hypothesis, literature study, data collection and processing, elaboration of research proposal and scientific work presentation; Computation, matlab basics, logical expression, vectorisation, flow control using if and while, loop in matlab, function and m-file, test output, programming matlab, binary number, floating point numbers, device precision, linear equation, curve fitting, differential equation, statistics and analysis of process data.

**ENMT 801104 - MECHANICS OF MATERIALS - (3 Credit Points)**

Introduction to mechanics of materials, types of material failure, engineering and selection of materials, elastic deformation and theory of strength, inelastic deformation, metals and alloys processing, composites, ceramics and glasses, polymers, concept of stress and strain, rheological model, plastic deformation, creep deformation, anisotropic materials, theory of mechanical testing of materials, stress-strain properties, tendency of tensile behaviour, interpretation of true stress-strain, compression, hardness, impact, bending and torsion testings, plane stress, plane strain, three dimensional stress condition, stress on octahedral plane, complex strain condition, common form of failure criteria, concept of fracture mechanics, fracture toughness value, application of K value in design and analysis, fatigue based on stress, loading cycle, stress-time curve, average stress, multiaxial stress, fatigue crack growth, fatigue based on strain, strain vs age, effect of average stress, lifetime estimation of structural components and creep.

**ENMT 801205 - PRINCIPLES OF CORROSION - (3 Credit Points)**

Fundamental concepts of electrochemistry and its application, definition of corrosion, forms of corrosion, cost of corrosion, electrical concept relevant to corrosion, relevant concept of chemistry and electrochemistry, thermodynamic prediction of corrosion propensity, electrolyte, Kinetics of corrosion, over-potential (polarisation), passivation, corrosion rate measurement, metallurgical

aspects, forms of corrosion and joint potential theory, corrosion testing (weight loss coupon method, electrochemistry).

**ENMT 802006 - DESIGN AND SELECTION OF MATERIALS - (3 Credit Points)**

Classification of engineering materials, factors and systematics of design and selection of materials, material property chart and performance index, design for corrosion resistance, design of high temperature materials and design of wear and fatigue resistant materials, design of plastics and composites, design of various carbon steel, cast iron and steel alloys (tool steel, stainless steel, heat resistant steel, wear resistant steel), super alloys, and case studies of material selections.

**ENMT 802007 - MATERIALS CHARACTERIZATIONS - (3 Credit Points)**

**ENMT 802008 - LABORATORY - (1 Credit Points)**

Introduction, standards and procedure of testing, principles and methods of advanced analysis for engineering materials chemical composition (AAS, OES, EDS, XPS), identification of crystal structure (x-ray diffraction), advanced metallography (SEM, EPMA, TEM), and thermal analysis (DTA, TGA, DSC, TMA).

**ENMT 802109 ADVANCED MANUFACTURE - (3 Credit Points)**

Metal forming as part of design and manufacture process; general principles, phenomena and mechanism related to casting of metals; mold (sand, ceramics, metals), gating system, and simulation. Solidification process of cast iron and aluminium, liquid treatment for ferrous metal (innoculation, Mg treatment) and nonferrous (modifier, grain refiner), various methods of casting, casting defects; General principles, phenomena and mechanism of solid phase metals through forging, rolling, extrusion, drawing, sheet metal forming, and thermo mechanical treatment. The phenomenon and mechanism of powder metallurgy, fabrication of metal powder, and mechanism of powder formation, characterisation and characters of powder, mechanical alloying, pre compaction process, compaction, preform characteristics, sintering, and powder consolidation, full density processing; types of sintering devices and related aspects, application and utilization of powder metallurgy products. Case study of processing selection and evaluation of manufacturing process.

**ENMT 802210 - ADVANCED CORROSION - (3 Credit Points)**

Introduction, thin and aqueous solution, thermodynamics aspects of aqueous corrosion, kinetics of corrosion, application of aqueous corrosion in practice (sea water corrosion, under soil corrosion, corrosion on soil environment), application of corrosion for non-ferrous metal, atmospheric corrosion, oxidation reaction at high temperature, thermodynamics of oxidation, growth of oxide layer, characteristics and properties of oxides, pilling-bedworth ratio, oxidation reaction rate, effect of oxygen pressure corrosion in specific environment, carburization at high temperature, decarburization, metal dusting, hot corrosion, high temperature corrosion testing, material protection at high temperature, high temperature resistant material, coating (aluminizing, chromizing, siliconizing). Case studies.

**ENMT 802211 - COATING & INHIBITION OF MATERIALS - (3 Credit Points)**

Coating: metallic coating, type and classification of metallic coating, protection mechanism, electroplating and electroless plating, anodizing, phosphating, chromating, hot dip galvanizing, Service life prediction, Organic Coating (paints), properties of organic coating, classification and formulation of paints, mechanism of protection, standard of surface preparation, application method, coating defects and painting failure. Inhibition; types, classification, and mechanism of inhibition (anodic, cathodic, and mixed inhibitor), formulation of corrosion inhibitor in general, application and limitation (in automotive, water coolant, drinking water system, petrochemical and refinery plant) VCI, layer forming corrosion resistant materials

**ENMT 803012 - FAILURE ANALYSIS + LAB - (4 Credit Points)**

Definition and goals of failure analysis, general factors contributing to material failure, general procedure in failure analysis techniques, classification of failure origins, characteristics & mechanism of failure analysis, ductile fracture, brittle fracture, fatigue fracture, and failure or brittleness affected by environmental conditions (thermal/ creep, corrosion, and wear), method and tool selections on failed material, yield criteria, initiation of plastic deformation, stress concentration, residual stress,



static failure, fundamental principles of fracture mechanics, failure analysis case study analysis and report making and presentation of failure analysis results.

**ENMT 803113 - WELDING METALLURGY - (3 Credit Points)**

Introduction to material joining, classification, basic principles and process characteristics of electric arc welding and its benefits and drawbacks, classification & characteristics of welding machines and welding electrodes, flux and gas, parameter of welding and heat input, fundamental principles of welding metallurgy, metal transfer inside electric arc welding, microstructure of weld joint, alloying effect, temperature change in welding (HAZ), factors affecting cooling rate of weld metal, weldability of ferrous metal (steel and alloys, heat resistant steel and cast iron) & non-ferrous (Al, Cu, Mg, Ni, and their alloys), welding defects and prevention, heat treatment for welding (preheating & PWHT), weld joint quality control, case studies.

**ENMT 803114 - ADVANCED COMPOSITES - (3 Credit Points)**

Concepts, definition and classification of composites, matrix and reinforcement, composite fabrication, rule of mixture, interfacial and wetting theory, nano composites, composite mechanics, geometric aspect in composites, lamina and laminate, elastic behaviour, fire effect, theory of laminate, unidirectional strength of lamina, strength of laminate, strength of short fibre composites, fracture energy of composites, and case studies of composites.

**ENMT 803215 - CATHODIC PROTECTION - (3 Credit Points)**

Fundamental theory of cathodic protection, protection criteria, cathodic protection system using sacrificial anode, properties of sacrificial anode material and its selections, application of sacrificial anode cathodic protection, impressed current corrosion protection system (ICCP), instrument for corrosion protection, cathodic protection in sea water, soil, and internal structure of concrete (cement) environment, classification of material, specific relation of material and environment, corrosion protection design guidelines, resistant properties of stainless steel and super duplex SS, corrosion resistance of commonly used engineering materials (cast iron, carbon steel, low alloy steel, nickel, aluminium, copper, zinc, titanium, and their alloys), corrosion resistance of non metallic material (rubber, plastic, composite, ceramic).

**ENMT 800016 - RESEARCH PAPER - (2 Credit Points)**

Research result written in journal paper format and published in minimum of national journal or international proceeding.

**ENMT 800017 - SEMINAR OF THESIS PROPOSAL - (2 Credit Points)**

Work sheet/paper that will be presented in a seminar according to thesis proposal. Paper includes: problem and hypothesis, methodology and its discussion.

**ENMT 800018 - THESIS - (6 Credit Point)**

Application of various courses attended in an integral manner in a research to solve a metallurgical and materials engineering problem. The research result is written to a scientific report and presented before a panel of lecturer.

**ELECTIVES**

**ENMT 803919 - PROJECT MANAGEMENT - (3 Credit Points)**

The concept of project management system and system approach, engineering systems and procedures, basic planning, cost estimation and budgeting, project quality management, execution and project control, project organization, and context of project management, project communication, and project risk management.

**ENMT 803920 - ELECTRONIC MATERIALS - (3 Credit Points)**

concepts of electron theory (wave - particle duality, free electrons, nearly free electrons, band structure, insulators - conductors - semiconductors). Modern theory of solids (band theory of solids, density of states, Boltzmann and Fermi-Dirac statistics, electron effective mass and Fermi energy).

Electrical conduction in materials (classical electron theory, quantum mechanical considerations, magnetism, superconductivity, dielectrics and insulator, thermoelectric phenomena). Semiconductors (intrinsic and extrinsic semiconductors, degenerate semiconductors, recombination and minority carrier junction, Schottky junctions and Ohmic contacts, semiconductor devices)

**ENMT 803921 - POLYMER DERIVATIVES - (3 Credit Points)**

Industrial strategic approaches in polymer derivatives material. General introduction in polymer derivatives (polyblends, polyalloys, thermoplastic elastomer, polymer matrix composites, liquid crystal polymer, conductive polymers, pyro and piezo polymers, shape memory polymers. Biodegradable polymer (definition, types, manufacturing process). Polymer material selection for polyblends and polyalloys synthesis. Process method selection (physics and chemical) for polymer alloying. Testing and evaluation of polymer alloying. Case studies.

**ENMT 803922 - RBI & INTEGRITY - (3 Credit Points)**

Definition: Asset Integrity & Risk Based Inspection, Policy including Health, Safety & Environment (HSE), Strategy /Prioritization, Program Planning, Hazard/Threat Identification, Damage Mechanism, Probability of Failure, Consequence of Failure, Asset Register, Risk Assessment, Program Implementation, Data Compilation-Evaluation-Interpretation, Corrective Actions & Recommendations, Inspection Interval, Inspection Methods, Inspection Scope, Inspection Work package.

**ENMT 803923 - ADVANCED POLYMER MANUFACTURING - (3 Credit Points)**

Fabrication steps of polymer production (formulation, establishment and finalization). Purpose and process of finalizing the type of polymer products (deflashing, smoothing and polishing, sawing and cutting, drilling, grinding and sanding, routing, milling & turning, tapping & threading, cleaning, annealing, assembling, and decoration). Types of assembling processes (mechanical joining, welding and adhesive bonding). This type of decorating process (painting, plating, thermal spray coating, vacuum metalizing, hot stamping, coloring). Construction machinery and mechanisms work finalization processes. The selection of the process of finalizing the fabrication of a polymer product. Case studies on the fabrication process of finalizing the product packaging (rigid and flexible), automotive, electronics and construction equipment.

**ENMT 803924 - ADVANCED EXTRACTIVE METALLURGY - (3 Credit Points)**

Waste characterization processes for raw materials. Innovation wet metallurgical process (hydrometallurgy) and metallurgical heat (pyrometallurgy) for low grade raw materials and energy efficiency: reaction mechanisms and applications, such as metal extraction with plasma, microwave. Metal recycling process. Slag processing, metallurgical dust and ash particles. Processing and utilization of by-products (by product): the use of slag, dross processing, processing of flash. Obtaining metals from waste processes (such as tailings, residue, sludges) from the mineral processing tailings, red mud from metal recovery, metal recovery from waste sludge. The new technology of metal recycling process.

**ENMT 803925 - ADVANCED SURFACE ENGINEERING - (3 Credit Points)**

Fundamental of surface engineering, conventional surface engineering, advanced surface engineering practices, surface coatings and surface modifications, advanced topics on characterizations for thin film

**ENMT 803926 - POLYMER MANUFACTURING TECHNOLOGY - (3 Credit Points)**

Polymer introduction and its product. Types and steps of polymer manufacturing machines. Extrusion and its derivatives (blown film, calendaring, blow molding, thermoforming and pultrusion). Rotational molding. Reinforcing process. Laminating process. Casting process. Injection molding and its derivatives (stretch blow molding and RIM). Machine types for rubber product (formulation and fabrication). General construction and work mechanism in rubber product processing.

**ENMT 803927 - NANO TECHNOLOGY - (3 Credit Point)**

Scope and definition of nanotechnology, physical and chemical of solid surface, nanostructures (zero, one and two dimensional), special nanomaterials, fabrication processes (lithography, nanolithography, soft lithography, assembly), nanomaterial characterizations (physical, chemical and structural) and applications (MEMS, DNA chips, photonics, crystal)

DOCTORAL  
PROGRAM



## 7. DOCTORAL PROGRAM

FTUI holds Doctoral Program for the six following study programs:

1. Civil Engineering
2. Mechanical Engineering
3. Electrical Engineering
4. Metallurgy & Material Engineering
5. Chemical Engineering
6. Architecture
7. Industrial Engineering

FTUI Doctoral program was officially opened in 2000 with the opening of the Civil Engineering and Electrical Engineering Doctoral program followed by the emersion of the Opto-electrotechnique and Laser Application study program into the Postgraduate Program of FTUI. The Mechanical Engineering study program was officially opened in 2006 while the Metallurgy & Material Engineering and Chemical Engineering followed in 2007. And In 2009, respectively Department of Architecture opened the Architecture Doctoral Program. In 2001, the Opto-electrotechnique and Laser Application was closed and was emerged into the Electrical Engineering study program. Each Doctoral study program is headed by the Head of Study Program which is held ex-officio by the Head of Department in the Faculty of Engineering UI. The Doctoral study programs have one or more focus subjects to give a more specific knowledge on engineering field to all students of the program.

Currently, the Doctoral Program is held in two ways: Lecture & Research; and Research.

### New Students Selection

Selection process for new students for the FTUI Doctoral Program is as follow:

1. Pre-admission stage: future student is encouraged to informally contact their prospective Promotor or the Head of Department to further discuss his/her desired dissertation topic. This is important to make sure the availability of Promotor in accordance to said research topic. Communication may be done through email or face to face. The Head of Department and future Promotor then would discuss the student's proposal internally.
2. Future student should register online via <http://penerimaan.ui.ac.id> and complete the required documents and prerequisites.
3. Future student will then take the entrance examination (SIMAK UI) which consists of: (i) Academic Potential Examination and (ii) English Proficiency Test.
4. The results of the Entrance Examination will then be sent to FTUI by the UI Entrance Examination Committee. These results will then be discussed in a Department Committee Meeting headed by the Head of Department to determine which students accepted, and the proposed research topic approved, and the availability of future Promotor. An interview have to be arrange with the future student to determine the suitability of research topic, with previous study field, and the student's commitment to participate in the Doctoral program full time. Interview may be done directly or through email or messenger application.
5. The outcome of the Department Committee Meeting will then be submitted to the UI Entrance Examination Committee to be announced.

### Academic Counseling

Since the day a student is registered as student for the Doctoral program until the time that he/she passes qualification examination, the student will be under the guidance of an academic advisor who the student expected to be their Promotor or Co-Promotor. Head of Department accepts a proposal of future Promotor/Academic Advisor from a committee in the Department. Once the student pass the qualification examination, the student will earn status as Doctor Candidate and the Academic Advisor's status will revert to Promotor/Co-Promotor.

### Promotor and Co-Promotor

Promotor and Co-Promotor for Doctoral Program are lecturers or experts from related field and are assigned by Head of Department based on a Rector's Decree to guide and advise a Doctor candidate in

conducting research and dissertation writing. Academic Advisor consist of 1 Promotor and a maximum of 2 (two) Co-Promotors. Promotor is a first chair Advisor who holds an academic degree of Professor or Doctor and a minimum of Senior Lecture academic position; has a relevant expertise in the field which the student's dissertation topic is; and is acknowledge as a full time faculty at the Universitas Indonesia, and for the last five years has produced at the latest: one scientific paper in an accredited national journal or a reputable international journal; or one other form of scientific product which is acknowledge by a group of experts set up by the Academic Senate of Universitas Indonesia.

Co-Promotors are the Promotor's companions who act as second and/or third chair advisor who hold academic degree of Doctor or Senior Lecturer, and has a relevant expertise in the field with the student's dissertation topic. Co-Promotor from outside of the Faculty of Engineering UI must have the approval from the Promotor. Promotor and Co-Promotors are appointed by the Rector based on the proposal submitted by the Dean which are also based on suggestions from the Head of Department after the student has pass the qualification examination. The appointment must be done at the latest 1 (one) semester after the qualification examination. A change of Promotor/Co-Promotor must be proposed by the Dean to the Rector based on a proposal from the Head of Department.

## Program Specification

1	<b>Awarding Institution</b>		Universitas Indonesia
2	<b>Teaching Institution</b>		Universitas Indonesia
3	<b>Programme Title</b>		Doctoral Program in Civil Engineering Doctoral Program in Mechanical Engineering Doctoral Program in Electrical Engineering Doctoral Program in Metallurgy & Material Engineering Doctoral Program in Chemical Engineering Engineering Doctoral Program in Architecture Doctoral Program in Industrial Engineering
4	<b>Class</b>		Regular
5	<b>Final Award</b>		Doctor (Dr.)
6	<b>Accreditation / Recognition</b>		Civil Engineering Doctoral Program: Accreditation A from BAN-PT Mechanical Engineering Doctoral Program: A Accreditation A from BAN-PT Electrical Engineering Doctoral Program: Accreditation A from BAN-PT Metallurgy & Material Engineering Doctoral Program: Accreditation A from BAN-PT Chemical Engineering Engineering Doctoral Program: Accreditation A from BAN-PT Architecture Doctoral Program: Accreditation B from BAN-PT Industrial Engineering Doctoral Program: On Accreditation Process
7	<b>Language(s) of Instruction</b>		Indonesia
8	<b>Study Scheme (Full Time / Part Time)</b>		Full Time
9	<b>Entry Requirements</b>		Master graduate from study programs in line with study program chosen and pass the entrance examination
10	<b>Study Duration</b>		Designed for 3 years
	Type of Semester	Number of semester	Number of weeks /semester
	Regular	6	14 - 17
	Short (optional)	none	none

11	<p><b>Streams:</b></p> <p><i>The Civil Engineering Doctoral Program has six streams as follow:</i></p> <ul style="list-style-type: none"> <li>• <i>Structure</i></li> <li>• <i>Construction Management</i></li> <li>• <i>Transportation</i></li> <li>• <i>Water Resource Management</i></li> <li>• <i>Project Management</i></li> <li>• <i>Geotechnique</i></li> </ul> <p><i>The Mechanical Engineering Doctoral Program has four streams as follow:</i></p> <ul style="list-style-type: none"> <li>• <i>Energy Conversion</i></li> <li>• <i>Engineering Design and Product Development</i></li> <li>• <i>Manufacture Engineering</i></li> <li>• <i>Fire Safety Engineering and Management</i></li> </ul> <p><i>The Electrical Engineering Doctoral Program has eight streams as follow:</i></p> <ul style="list-style-type: none"> <li>• <i>Telecommunication Engineering</i></li> <li>• <i>Electrical Power and Energy Engineering</i></li> <li>• <i>Photonic and Electronic Engineering</i></li> <li>• <i>Control Engineering</i></li> <li>• <i>Multimedia and Information Engineering</i></li> <li>• <i>Security of Information Network Engineering</i></li> <li>• <i>Telecommunication Management</i></li> <li>• <i>Electrical Power and Energy Management</i></li> </ul> <p><i>The Metallurgy &amp; Material Engineering Doctoral Program has two streams as follow:</i></p> <ul style="list-style-type: none"> <li>• <i>Corrosion and Protection</i></li> <li>• <i>Material Engineering and Manufacture Process</i></li> </ul> <p><i>The Chemical Engineering Doctoral Program has five streams as follow:</i></p> <ul style="list-style-type: none"> <li>• <i>Industry Catalist</i></li> <li>• <i>Gas Management</i></li> <li>• <i>Product Design and Chemical Process</i></li> <li>• <i>Environmental Protection and Work Safety</i></li> <li>• <i>Gas Technology</i></li> </ul> <p><i>The Industrial Engineering Doctoral Program has two streams as follow:</i></p> <ul style="list-style-type: none"> <li>• <i>Rekayasa Kualitas Manufaktur</i></li> <li>• <i>Rekayasa Sistem Jasa</i></li> </ul>
12	<p><b>Graduate Profiles:</b></p> <p>FTUI Doctoral Program Graduates has the capabilities of demonstrating expansion, novelty breakthrough in research in the engineering or architecture field in accordance to certain stream or sub-stream. The FTUI Doctoral Program prepares student to work in academic and research in accordance to their own stream; dedicate their expertise in research laboratory, industry or government institution; or create a business based on their innovation.</p> <p>Graduates are able to possess the following skill:</p> <ul style="list-style-type: none"> <li>• Be able to show expertise in the engineering or architecture discipline;</li> <li>• Be able to uphold the academic and research ethics;</li> <li>• Be able to work collaboratively in research;</li> <li>• Be able to position themselves as leader in their community;</li> <li>• Be able to communicate well in their community and build networks;</li> <li>• Be able to demonstrate individual live skill in connection to human relationship;</li> <li>• Be able to demonstrate attitude, behavior and way of thinking which support their success in society.</li> </ul>



13	<b>Graduates Competence:</b> The aim of Doctoral Program in FTUI is in line with the Doctoral Program of Universitas Indonesia, to produce quality graduates with the following competence:		
	<ol style="list-style-type: none"> <li>1. Able to independently update their knowledge on science and technology in engineering or architecture through research based innovation breakthrough.</li> <li>2. Able to show professionalism in their field of study that can be accountable towards the development of science and technology.</li> <li>3. Able to write a scientific paper in engineering or architecture and convey the result of their research to the public both orally or written in an international scientific activity.</li> <li>4. Able to recommend a solution for a complex problem faced by society in the field of engineering or architecture through inter, multi and trans discipline approach.</li> <li>5. Able to lead a working or research team to solve problem in the field of engineering or architecture that can be of benefit for the good of mankind.</li> <li>6. Able to develop and maintain a network of cooperation with fellow researcher and research community in the field of engineering and architecture both in national and international level.</li> </ol>		
14	<b>Classification of Subjects. (Course &amp; Research)</b>		
No	Classification	Credit Hours	Percentage
i	Course Component	18	34 %
ii	Research Component	34	66 %
	Total	52	100 %
14	<b>Classification of Subjects. (Research)</b>		
No	Classification	Credit Hours	Percentage
i	Course Component	0	0 %
ii	Research Component	52	100 %
	Total	52	100 %
15	<b>Total Credit Hours to Graduate</b>		52 CP

### Curriculum Structure for FTUI Doctoral Program

The curriculum structure for the Doctoral Program in all study programs are the same, they are only differentiated by their codes for the research component. The code “xx” for each study programs are as follow:

ENCV for Civil Engineering, ENME for Mechanical Engineering, ENEE for Electrical Engineering, ENMT for Metallurgy & Material Engineering, ENAR for Architecture, and ENCH for Chemical Engineering.

The FTUI Doctoral Program is held in two program: Course and Research and Research.

#### 1.1. DOCTORAL PROGRAM (COURSE & RESEARCH)

The following is the curriculum structure for Course & Research Doctoral Program in Table 1.  
Table 1. The Curriculum Structure - Doctoral Program in Course and Research

KODE/CODE	MATA AJARAN	SUBJECT	SKS
	<b>Semester 1</b>	<b>1st Semester</b>	
ENGE900001	Metode Penelitian Lanjut	Advanced Research Method	6
ENMT900001	Kekhususan 1	Special Subject 1	4
		<b>Sub Total</b>	<b>10</b>
	<b>Semester 2</b>	<b>2nd Semester</b>	
ENGE900002	Analisis Kualitatif & Kuantitatif	Qualitative & Quantitative Analysis	4
ENMT900002	Kekhususan 2	Special Subject 2	4
ENMT900004	Proposal Riset	Research Proposal	6
		<b>Sub Total</b>	<b>14</b>
	<b>Semester 3</b>	<b>3rd Semester</b>	
ENMT900006	Publikasi - Konferensi Internasional	Publication - International Conference	4
		<b>Sub Total</b>	<b>4</b>
	<b>Semester 4</b>	<b>4th Semester</b>	
ENMT900007	Ujian Hasil Riset	Research Result Examination	10
		<b>Sub Total</b>	<b>10</b>
	<b>Semester 5</b>	<b>5th Semester</b>	
ENMT900008	Publikasi II - Jurnal Internasional	Publication II - International Journal	8
		<b>Sub Total</b>	<b>8</b>
	<b>Semester 6</b>	<b>6th Semester</b>	
ENMT900010	Sidang Promosi	Sidang Promosi	6
		<b>Sub Total</b>	<b>6</b>
	<b>Total</b>		<b>52</b>

The Lecture Component includes four subjects:

- Advanced Research Method, 6 sks
- Qualitative and Quantitative Analysis, 4 sks
- Special Subject I, 4 SKS.
- Special Subject II, 4 SKS.

The Research Component includes:

- Research Proposal, 6 SKS
- Publication - International Conference, 4 SKS

3. Research Result Examination, 10 SKS
4. Publication - International Journal, 8 SKS
5. Promotion Exam, 6 SKS

### 1.2. DOCTORAL PROGRAM (RESEARCH)

The following is the curriculum structure for Research Doctoral Program in Table 2.

Table 2. The Curriculum Structure - Doctoral Program in Research

KODE/CODE	MATA AJARAN	SUBJECT	SKS
	<b>Semester 1</b>	<b>1st Semester</b>	
ENMT900003	Seminar Berkala Kelompok Ilmu	Research Group Periodic Seminar	8
		<b>Sub Total</b>	<b>8</b>
	<b>Semester 2</b>	<b>2nd Semester</b>	
ENMT900004	Proposal Riset	Research Proposal	6
		<b>Sub Total</b>	<b>6</b>
	<b>Semester 3</b>	<b>3rd Semester</b>	
ENMT900005	Publikasi I - Konferensi Internasional	Publication I - International Conference	4
		<b>Sub Total</b>	<b>4</b>
	<b>Semester 4</b>	<b>4th Semester</b>	
ENMT900007	Ujian Hasil Riset	Research Result Examination	10
		<b>Sub Total</b>	<b>10</b>
	<b>Semester 5</b>	<b>5th Semester</b>	
ENMT900008	Publikasi II - Jurnal Internasional	Publication II - International Journal	8
		<b>Sub Total</b>	<b>8</b>
	<b>Semester 6</b>	<b>6th Semester</b>	
ENMT900009	Publikasi III - Jurnal Internasional	Publication III - International Conference	8
ENMT900010	Sidang Promosi	Sidang Promosi	6
		<b>Sub Total</b>	<b>14</b>
<b>Total</b>			<b>52</b>

**Description of Subjects****ENGE900001****ADVANCED RESEARCH METHOD****6 SKS**

**Learning Objective(s):** Course participants are expected to: (a) master the scientific work process based on science philosophy, which is the scientific justification aspects, innovative aspects and scientific ethics aspects, (b) able to write a research proposal and or draft of scientific writing related to the student's doctoral topic, (c) can map research result from the latest international journal in their field and understand the state-of-the-art from their research topic, and can determine the knowledge gap yet explored in the international level for further research in their Doctoral Program.

**Syllabus:** (1) Relationship between philosophy and engineering science; (2) Science Philosophy; (3) Epistemology in Engineering Science; (4) Research Method; (5) Problem formulation and hypothesis; (6) Research and state of the art; (7) Research Evaluation; (8) Design Evaluation and research Stages; (9) Introduction to the analysis of the data processing method; (10) Benchmark on research output and conclusion formulation; (11) Various citation method; (12) Finalization of research proposal draft and / or scientific article draft.

**Prerequisite(s):** None**Textbooks:**Haryono Imam R dan C. Verhaak, *Filsafat Ilmu Pengetahuan*, Gramedia, Jakarta, 1995Willie Tan, *“Practical Research Methods”*, Prentice Hall, 2002.R. Kumar, *Research Methodology, A Step-by-step Guide for Beginner*, 3rd ed., Sage Pub, 2012**ENGE900002****QUALITATIVE AND QUANTITATIVE ANALYSIS****4 SKS**

**Learning Objective(s):** Discuss the qualitative and quantitative in data analysis and exploring specific data analysis areas. After participating in this subject which discuss the qualitative and quantitative approach in data analysis in exploring specific areas of data analysis. Students are expected to be able to build the following learning outcome: (1) awareness to situations requiring qualitative data analysis in the inductive paradigm; (2) awareness to situations requiring quantitative data analysis in the deductive paradigm; (3) appreciation toward various approaches; (4) possessing skills in giving critical appraisal; (5) possessing skills in performing qualitative and quantitative data analysis.

**Syllabus:** Introduction; Qualitative Analysis; Quantitative Analysis; Non-Parametric Analysis; Uncertainty Analysis; Critical Appraisal; Design of Experiment; ANOVA revisit; Multivariate Techniques.

**Prerequisite(s):** None**Textbooks:**Miles M & Huberman M, *Qualitative Data Analysis*, London Sage Publications, (1994)Montgomery, D.C., & Runger, G.C, *Applied Statistics and Probability for Engineers 3rd Ed.*, John Wiley and Sons, Inc., New York, (2003)Kirkup, L, *Experimental Method: An Introduction to the Analysis and Presentation*, John Wiley and Sons, Australia, Ltd., Queensland, (1994)Montgomery, D.C, *Design and Analysis of Experiments 6th Ed.*, John Wiley and Sons, Inc., New York, (2005)Hair, J.F., B.Black, B.Babin and R.E Anderson, *Multivariate Data Analysis 6th Ed.*, Pearson Education Inc., New Jersey, (2006)**ENMT900001****Special Subject 1****4 SKS****ENMT900002****Special Subject 2****4 SKS**

Special Subject 1 in the 1<sup>st</sup> first semester (4 SKS) and Special Subject 2 in the 2<sup>nd</sup> semester (4 SKS) are determined together with the student's Academic Advisor to support the student's research and/or to develop the student's knowledge with information and knowledge from unrelated field. Academic Advisor is also allowed to propose a special content for the student to Head of Department.

The following are the requirements for the implementation of Special Subject 1 and 2:

For students who do not have in line Master degree educational background from the Faculty of Engineering Universitas Indonesia, they are allowed to take the similar courses of the related field of study available at the Master Program in FTUI during the running semester.

Students are also allowed to take courses from other study programs within the Faculty of Engineering Universitas Indonesia or courses from other faculties in UI as stated in the Guidance Book or the Master/Doctoral Program Catalog.

Students are allowed to take classes in other Master Program in the Faculty of Engineering Universitas Indonesia or other faculties within the Universitas Indonesia as deemed necessary by their Academic Advisor

In the event where neither conditions is viable for the students, the Academic Advisor is allowed to conduct a class of said course.

#### **ENMT900003**

##### **Research Group Periodic Seminar**

**8 SKS**

Research Group Periodic Seminar is an early activity of research in the Doctoral Program in Research where students conduct literature study in relation to the materials for their research. This literature study must be done intensively by mapping out the research results from the latest international journals in related field. The final aim was so that students have a state-of-the-art understanding of their research topic, and can determine the knowledge gap previously unexplored in the international level for further research in their Doctoral Program. The result of this literature study is compiled in a literature study report presented in the Research Group Periodic Seminar to be examined by a panel comprises of future Promoter/ Academic Advisor and Examiners from related field of study. Students will passed this Research Group Periodic Seminar if they received a minimum grade of B.

#### **ENMT900004**

##### **Research Proposal**

**6 SKS**

Research Proposal is the continuous activity of the literature study, where after gaining a state-of-the-art knowledge of their research topic, students can formulize the scope of their Doctoral research and determine which research method will be use. The result of this activity is a comprehensive research proposal which include: goals, background and data analysis from early study or experiments done. Included in this research proposal is plan of work for each semester and its publication goals. At this level, it is expected for students to begin experiment activity or early study which can show the direction of their research is feasible and recent in his field. The early experiment or study result, the literature study and the whole research plan is then compiled in a Research Proposal Report to be presented and examined in a Research Proposal Examination. Students will passed this Research Proposal if they received a minimum grade of B.

#### **ENMT900007**

##### **Research Output Examination**

**10 SKS**

At this stage, students are expected to have a research output with a minimum of 75% from their research plan. Doctorate candidate are expected to have reach a research outcome which is the main part of the originally planned contribution. The outcome of this research is measured through the Research Output Examination. The examination committee is appointed through the Dean's Decree based on the Head of Department's proposal. These examiners consist of experts related in the field of study of the Doctorate candidate with at least one examiner from an institution outside of Universitas Indonesia. Doctor Candidate will passed this Research Output Examination if they received a minimum grade of B. At this stage, a Doctor Candidate are allowed to design a scientific article framework to be published in an indexed International Journal and determine which International Journal they will send the article to.

**ENMT900006****Publication - International Conference****4 SKS****ENMT900005****Publication I - International Conference****6 SKS**

At this stage, students are expected to have an experiment result or study to focused on in their research topic and clarify their research direction. The result of the experiment must also show innovation or breakthrough, mastery of knowledge on their stream in relation to their research topic, the depth of their research materials, and the mastery of the state of the art development in their field or research interest, originality, and the contribution towards science and/or its implementation. Once presented in front of their promoter and co-promoter, the whole research result at this stage will be deemed worthy for international conference publication.

**ENMT900008****Publication II - International Journal****8 SKS****ENMT900009****Publication III - International Journal****8 SKS**

The scientific publication is an integral part of research activity and a prerequisite in participating in a Promotion Examination. International Journal meant here is an English language journal which its editorial board consists of member from at least three different countries or more. A mandatory publication must have an "Accepted" status before the Promotion Examination. FTUI itself publish their own international journal, the International Journal of Technology (IJTech), which students can utilize as one of the international journal to publish their Doctoral research.

**ENMT900008****Promotion Examination****6 SKS**

Before deemed fit to participate in a Promotion Examination. Doctor Candidate are required to conduct additional research as a follow up from the Research Output Examination. The inputs and revisions given during the Research Output Examination must be completed and revised through a series of final research. At this stage, the Doctor Candidate must prove the authenticity and originality of their research as new contribution to the scientific world. Thus, at this stage, the Doctor Candidate is required to have an "Accepted" for their international Journal, they are also required to complete their dissertation paper ready to be tested during the Promotion Examination.

**Dissertation** is an academic scientific paper study output and/or in depth research done independently and contained new contribution to issues that are temporary already known the answer or new questions ask on issues that are seen to have been established in the field of science and technology by the Doctor Candidate under the guidance of his Academic Advisor. A Doctor Candidate that has completed the revision of their dissertation are required to submit a completed version of their dissertation in five hard cover books and original approval form that has been signed by their advisors and submitted to PAF FTUI signifying the end of their study. The format for writing and binding the Dissertation should follow the writing and binding guidelines in the Technical Guidelines of Final Project Writing for Students of

Universitas Indonesia that can be downloaded at <http://www.ui.ac.id/download>.

Promotion Examination is a scheduled academic activity as a medium of evaluation for the Doctor Candidate Dissertation as a requirement to obtain the highest academic title, Doctor. The requirements and provision for Promotion Examination are as follow:

- Promotion Examination can be done if all the scientific publication requirements are completed by the Doctor Candidate: a minimum of one publication in an International Scientific Journal (in "Accepted" status) in relation to their dissertation research. The Publication is required to state Faculty of Engineering Universitas Indonesia as one of the affiliation institution.
- Promoter and Co-Promoter gave a written approval on the dissertation as a sign that the dissertation can move forward to the Promotion Examination.
- The Promotion Examination is carried out by the Committee of Promotion Examination which is appointed with a Rector's Decree based on a proposal from the Head of Department and the Dean of the Faculty of Engineering Universitas Indonesia.
- The Committee of the Promotion Examination comprises of: (a) Promoter and Co-Promoter, (b) The Examiners, (c) a minimum of one examiner from outside of Universitas Indonesia.
- Examiners consist of experts from related field of study. In a special circumstances, an expert that is not from the academic community can be invited as part of the examiners team.
- The Promotion Examination is led by the Head of the Examiners Committee that is also a member of the committee outside of the Promoter/Co-Promoter and outside examiner. If the Head of the Examiners Committee is unavailable, his/her position can be replaced by one of the member of the examiner team.
- The Promotion Examination is held as an open session for a period of maximum three hours divided into two stages: the dissertation presentation given by the Doctor Candidate for 15-30 minutes and a question and answer session for 120-165 minutes.
- The Doctor Candidate will pass the Promotion Examination if they received a minimum grade of B with GPA 3.00.

#### **Facilities for Doctoral Program Students**

To make sure that student of FTUI Doctoral Program are able to conduct full time research and produce excellent publications as required, FTUI provides the following facilities:

#### **Doctoral Program Students' Workstation**

Compact cubicles in comfortable rooms are available as Doctoral program students' workstation. The locations for these workstations are located on the 2<sup>nd</sup> and 3<sup>rd</sup> floor of the Engineering Center Building. Access to these workstations requires a swipe card to guarantee security. A round the clock wi-fi service is also available. To procure a workstation and access card, students are requested to register to the Associate Dean for General Affairs in the Dean's building, 2<sup>nd</sup> floor, FTUI Depok.

#### **International Journal Article Writing Training**

These free of charge trainings for the FTUI Doctoral program students are held several times each year. The information regarding these trainings are communicated through an announcement in SIAK-NG, posters at each Department, Doctoral program mailing list and FTUI website ([www.eng.ui.ac.id](http://www.eng.ui.ac.id)).

#### **Research Proposal Writing Training**

These free of charge trainings for the FTUI Doctoral program students are held several times each year. The information regarding these trainings are communicated through an announcement in SIAK-NG, posters at each Department, Doctoral program mailing list and FTUI website ([www.eng.ui.ac.id](http://www.eng.ui.ac.id)).

#### **Line Editing Draft for International Journal Article**

FTUI provides funds for line editing drafts for International Journal Articles. Requirement for applying for this funds are: the article must include the promoter name as part of the writing team and state FTUI as the main affiliation. To be grant this facility, students only needs to send a draft of their article through email to the FTUI Associate Dean of Academic and Research ([rissetf@eng.ui.ac.id](mailto:rissetf@eng.ui.ac.id)). The time required for line editing is 2-4 weeks.

**Doctoral Program Mailing-List**

The Doctoral Program mailing list is used as a communication tool between the Dean's Faculty Heads, the Faculty Center Administration staff and all Doctoral program students in FTUI. Information regarding trainings, seminars, grants or other academic matters is announced through this mailing list. Complaints and suggestions are also accommodated by this mailing list. The mailing list address is: [programdokterft@group.eng.ui.ac.id](mailto:programdokterft@group.eng.ui.ac.id)

**Research and Incentive Grants for Master and Doctoral Program**

Research funds including consumables and tests for research as part of the thesis and dissertation writing is the responsibility of the student. There are a number of competitive research grants, incentive research grant schemes available from which Master and Doctoral program students may propose to finance his/her research. Complete guidance and research proposal examples are available at the Associate Dean for Research and Community Development secretary at the Dean's Building, 2<sup>nd</sup> floor or through <http://research.eng.ui.ac.id>.

**International Journal Writing Incentive**

This incentives are given to lecturer of State of Private Universities that have published an article in an international journal. Each proposer must be the first writer of the article and include an institution affiliation in Indonesia.





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[www.eng.ui.ac.id](http://www.eng.ui.ac.id)