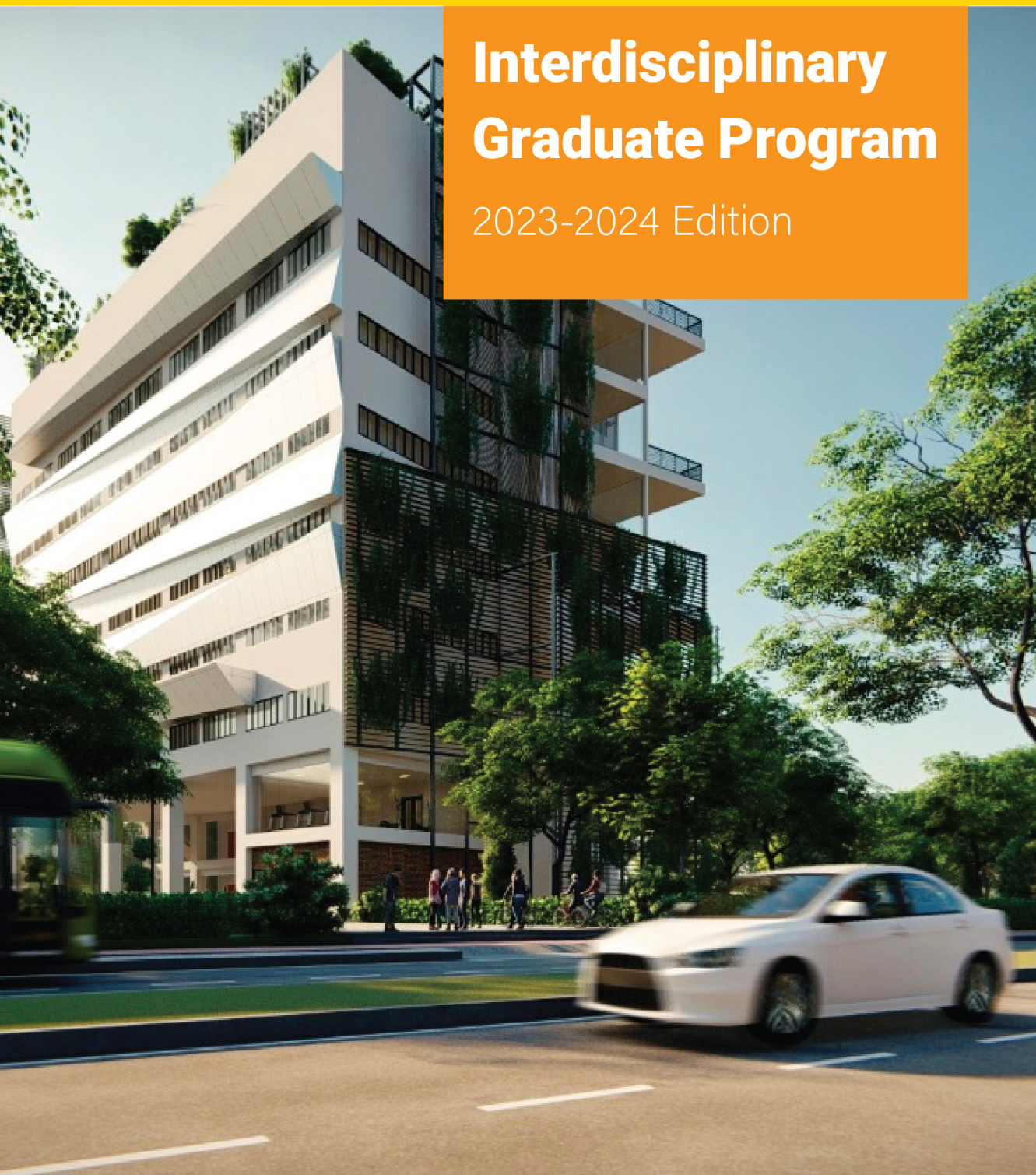


Interdisciplinary Graduate Program

2023-2024 Edition



FACULTY OF ENGINEERING
UNIVERSITAS INDONESIA
ACADEMIC GUIDEBOOK
2020 - 2024

2023 EDITION

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INTERDISCIPLINARY GRADUATE PROGRAM

2020 - 2024

2023 Edition

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PREFACE

Welcome to FTUI !

On behalf of the Faculty of Engineering Universitas Indonesia (FTUI). I would like to extend our warmest welcome to all students joining us this year. Our faculty is one of the largest faculty in the Universitas Indonesia and is proud to call ourselves one of Indonesia's leading education and research institutions. With the support of our faculty members, we provide an excellent learning and research environment for our students.

This 2023 Academic Guidebook is intended for all students of the Undergraduate Program (Regular, Parallel, International), Master Program, Professional Program, and Doctoral Program, to be used during their study at the Faculty of Engineering Universitas Indonesia. The curriculum, syllabus, and academic staff are listed, as well as all support information provided for you. The information contained within this book is also helpful for those considering continuing their study in the engineering field at the Universitas Indonesia.

Continuing the previous Academic Guidebook, we have refined the curriculum design based on the spirit of the Industrial Revolution 4.0 and the concept of "Merdeka Belajar Kampus Merdeka". The curriculum was designed based on the Outcome Based Education (OBE) system. The international standard engineering education outcome has been set in intended to prepare our graduates to be able to compete not only at the national or regional level but also in the global labor market.

In this guidebook, you will also find general information on FTUI and our Department/Study Program. It contains the education system, the academic regulations, the curriculum, and the syllabus of the subject taught in all our programs. In this guidebook, we are also proud to inform that starting the Academic Year 2023/2024, we opened the Professional Engineer Program (PPI) for the Recognition of Past Learning (RPL). This is a formal education program that uses work experience as the basis for continuing education for equality with certain qualifications. In addition, starting the Academic Year 2023/2024, FTUI will open the Master Program by Research. This program is a development of the existing Master Program by Course. This program is opened to provide learning opportunities for the community broad range, both from graduate students, and academics, to practitioners who already have research experience.

Lastly, I would like to convey my gratitude and appreciation to our stakeholders and the curriculum team for their contributions to the renewal curriculum. My sincere thank goes to all faculty members who have helped with the compilation of this academic guidebook, especially the Vice Dean for Academic, Research, and Student Affairs, the Vice Dean for Resources, Venture, and General Administration, the Associate Dean for Academic, the Heads and Vice Heads of Department, the Head of Study Programs, and the committee members. With the spirit of FTUI Entrepreneur Vision #ExcellentImpactful, let us deliver our graduates to be the best engineers in their field wherever they are.

Depok, November 2023
Faculty of Engineering Universitas Indonesia



Prof. Dr. Heri Hermansyah, ST., M.Eng., IPU

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CHAPTER 1

PROFILE OF DEPARTMENT



Profile of FTUI & Departments

History of FTUI

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

After successful accomplishment of the road renovation project, these young engineers with their iron will felt that there was more that they could do to serve their 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 the 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 Universitas 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 the Decree No. 76 dated July 17, 1964 regarding the establishment of the Faculty of Engineering. The Faculty of Engineering was officially established in Jakarta without any official ceremony or celebration under the banner of Universitas Indonesia as the youngest faculty. Thus, the history of the Faculty of Engineering of Universitas Indonesia began with its first three Study Programs and their respective Heads of Study Programs: Ir. Sutami as

the Head of the Civil Engineering Study Program, Ir. Ahmad Sayuti as the Head of the Mechanical Engineering Study Program, and Ir. K. Hadinoto as the Head of the Electrical Engineering Study Program.

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

In 1985, the Gas Engineering study program (originally under the Metallurgy Study Program) joined the Chemical Engineering study program (originally under the Mechanical Study Program) and formed the Gas and Petrochemical Engineering Study Program with Dr. Ir. H. Rachmantio as its first Head of the Study Program. The Industrial Engineering Study Program, was opened in 1999 with Ir. M. Dachyar, M.Sc. as its first Head of the Study Program. The Biomedical Engineering Study Program as the youngest study program in the Faculty of Engineering of UI, was opened in 2018 with Dr. Basari S.T., M.Eng. as the first Head of Study Program. The term "major" was later changed into "department", and it is still used today.

Vision and Mission of FTUI

FTUI Vision

To become a globally excellent and competitive engineering institution, through efforts to educate the nation's life to improve people's welfare, thereby contributing to the development of Indonesian society and the world.

FTUI Entrepreneur Vision #ExcellentImpactful

Establishing FTUI Entrepreneurs with Excellent Impact through Productivity-Based Multidisciplinary Collaboration Towards Excellent and Globally Competitive FTUI.

FTUI Mission

1. To provide wide, fair and good quality engineering education,

2. To organize Tridharma engineering activities that are of high quality and relevant to national and global challenges,
3. To create engineers who are highly intellectual, virtuous and able to compete globally.
4. To create academic climate in engineering that can support the realization of UI's vision.

FTUI Three Strategies for 2022-2026

1. Empowering Engineering Entrepreneurship,
2. Impactful Research and Innovation,
3. Modernization of Engineering Education

FTUI 11 Priority Programs for 2022-2026

1. Organization of Multidiscipline Engineering
2. Reverse Engineering Center
3. Engineering Seed Funds and Grants
4. Engineering Revenue Recognition
5. Database Engineering Networks
6. Organization of Strategic Engineering Education
7. Virtual Engineering Education Facility
8. Engineering Professional Program
9. Partnership and Collaboration Package
10. International Academic Recognition

UI and FTUI Administration

UI

Rector: Prof. Ari Kuncoro, S.E., M.A., Ph.D

Prof. Dr. rer. nat. Abdul Haris

Vice Rector for Academic and Student Affairs

Vita Silvira, S.E., MBA.

Vice Rector for Finance and Logistics

drg. Nurtami, Ph.D., Sp,OF(K)

Vice Rector for Research and Innovation

Prof. Dr. Ir. Dedi Priadi, DEA

Vice Rector for Human Resources and Assets

dr. Agustin Kusumayati, M.Sc., Ph.D

University Secretary

FTUI

Dean: Prof. Dr. Heri Hermansyah, ST., M.Eng., IPU

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

Vice Dean for Academic Research and Student Affairs

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

Vice Dean for Resources, Venture and General Administration

Dr. Nyoman Suwartha, S.T., M.T., M.Agr.

Associate Dean for Academic

Dr.rer.pol. Romadhani Ardi, S.T., M.T.

Associate Dean for Student Affairs, Research and Community Engagement

Dr. Ajib Setyo Arifin, S.T., M.T.

Associate Dean for Human Resource and General Administration (Faculty)

Tikka Anggraeni, S.Sos., M.Si., CPR.

Associate Dean for Public Communication and General Administration

Dr.-Ing. Ir. Dalhar Susanto

Associate Dean for Cooperation, Venture, and Alumni

Prof. Dr. Ir. Winarto, M.Sc.

Head of Academic Quality Assurance Unit

Dr. Muhamad Sahlan, S.Si., M.Eng.

Head of Entrepreneur Innovation Unit and Head of Reverse Engineering Center

Prof. Dr. Ir. Harinaldi, M.Eng.

Head of Education Modernization and Internationalization Unit

Prof. Dr. Ir. Widodo Wahyu Purwanto, DEA.

Head of Interdisciplinary Engineering Education and Research Unit and Head of Master Study Program in Energy Systems Engineering

Departments

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

Civil Engineering:

- Ayomi Dita Rarasati, S.T., M.T., Ph.D
- Andyka Kusuma, S.T., M.Sc., Ph.D.

Mechanical Engineering:

- Dr. Agus Sunjarianto Pamitran, ST., M.Eng.
- Dr.-Ing. Mohammad Adhitya, S.T., M.Sc.

Electrical Engineering:

- Dr. Eng. Arief Udhiarto, S.T., M.T., IPM
- Dr. Abdul Halim, M.Eng

Metallurgical & Materials Engineering:

- Dr. Deni Ferdian, S.T., M.Sc.
- Dr. Ahmad Zakiyuddin, S.T., M.Eng.

Architecture:

- Dr. Ir. Achmad Hery Fuad, M.Eng.

- Kristanti Dewi Paramita, S.Ars., M.A., Ph.D.

Chemical Engineering:

- Dr. Bambang Heru Susanto, ST., MT
- Dr. Dianursanti, S.T., M.T

Industrial Engineering:

- Dr. Komarudin, ST., M.Eng
- Dr. Zulkarnain, ST., MT.

Study Programs

Professional Program for Engineers

- Prof. Dr. Fitri Yuli Zulkifli, M.Sc.

Energy Systems Engineering

- Prof. Dr. Ir. Widodo Wahyu Purwanto, DEA

Urban & Regional Planning

- Dr.-Ing. Ova Chandra Dewi, M.Sc.

Board of Professors

- Prof. Dr. Ir. Budi Susilo Soepandji
- Prof. Dr.-Ing. Ir. Bambang Suharno
- Prof. Dr. Ir. Sutanto Soehodjo, M.Eng
- Prof. Dr. Ir. Bondan T. Sofyan, M.Si
- 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. Ir. Nji Raden Poespawati, MT
- Prof. Dr. Ir. Iwa Garniwa, MK., MT
- Prof. Dr. Ir. A. Herman Yuwono, M.Phil.Eng
- Prof. Dr. Ir. Muhammad Idrus Alhamid
- Prof. Yandi A. Yatmo, S.T., M.Arch., Ph.D
- Prof. Dr. Ir. Riri Fitri Sari, M.Sc.MM
- Prof. Dr. Ir. Adi Surjosatyo, M.Eng
- Prof. Dr. Benyamin Kusumoputro, M.Eng
- Prof. Ir. Widjojo Adi Prakoso, M.Sc., Ph.D
- Prof. Dr. Ir. Kalamullah Ramli, M.Eng
- Prof. Dr. Ir. Winarto, M.Sc
- Prof. Dr. Ir. Eddy S. Siradj, M.Sc
- Prof. Dr. Ing. Ir. Misri Gozan, M.Tech.
- Prof. Dr. Ir. Johnny Wahyuadi Mudaryoto
- Prof. Dr. Ir. Nelson Saksono, MT
- Prof. Dr. Ir. Anne Zulfia, M.Sc
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- Prof. Ir. Kamarza Mulia, M.Sc., Ph.D.
- Prof. Dr. Ir. Engkos Achmad Kosasih, M.T
- Prof. Dr.-Ing. Nasruddin
- Prof. Ir. Warjito, M.Sc., Ph.D.
- Prof. Dr. Ir. Muhamad Asvial, M.Eng
- Prof. Dr. Ir. Wahyu Nirbito, MSME
- Prof. Dr. Akhmad Hidayatno, S.T., MBT
- Prof. Dr. Eng. Ir. Sri Harjanto
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15. **Prof. Dr. Katsuhiko Takahashi**,
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22. **Prof. Christopher Silver**,
(Professor (Emeritus) University of Florida)

Academic Programs at FTUI

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

1. Civil Engineering
2. Environmental Engineering

3. Mechanical Engineering
4. Naval Architecture and Marine Engineering
5. Electrical Engineering
6. Computer Engineering
7. Metallurgical & Materials Engineering
8. Architecture
9. Interior Architecture
10. Chemical Engineering
11. Bioprocess Engineering
12. Industrial Engineering
13. Biomedical Engineering

Twelve Master Programs:

1. Civil Engineering
2. Mechanical Engineering
3. Electrical Engineering
4. Metallurgical and Material Engineering
5. Architecture
6. Chemical Engineering
7. Industrial Engineering
8. Biomedical Technology
9. Energy Systems Engineering
10. Environmental Engineering
11. Urban & Regional Planning
12. Materials Integrity Management

Seven Doctoral Programs:

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

and two Professional Program:

1. Professional Program for Engineers
2. 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:

1. Civil Engineering :
Excellent
2. Mechanical Engineering :
Excellent
3. Electrical Engineering :
A
4. Computer Engineering :
Excellent
5. Metallurgical & Material Engineering :
Excellent
6. Architecture :
Excellent
7. Chemical Engineering :
Excellent
8. Industrial Engineering :
Excellent
9. Naval Architecture & Marine Engineering :
Excellent
10. Environmental Engineering :
Excellent
11. Architecture Interior :
Excellent
12. Bioprocess Engineering :
Excellent
13. Biomedical Engineering :
Good

Accreditation for Master Program is as follows:

1. Civil Engineering :
A
2. Mechanical Engineering :
A
3. Electrical Engineering :
A
4. Metallurgical and Materials Engineering :
A
5. Architecture :
A
6. Chemical Engineering :
Excellent
7. Industrial Engineering :
Excellent



8. Biomedical Technology :
B
9. Energy System Engineering :
Very Good
10. Environmental Engineering :
Good
11. Urban & Regional Planning :
Very Good
12. Materials Integrity Management :
Good

Accreditation for Doctoral Program is as follows:

1. Civil Engineering :
Excellent
2. Mechanical Engineering :
Excellent
3. Electrical Engineering :
A
4. Metallurgical and Materials Engineering :
Excellent
5. Architecture :
A
6. Chemical Engineering :
Excellent
7. Industrial Engineering :
Excellent

In 2008 & 2010, the Departments of Mechanical Engineering, Civil Engineering, Electrical Engineering, Metallurgical and Materials Engineering, Architecture and Chemical Engineering have been accredited by the Asean University Network (AUN),

In 2013 Departments of Industrial Engineering have been accredited by the ASEAN University Network (AUN). In 2016 Department of Civil Engineering have been re-accredited by AUN. In 2017 Technology Bioprocess and Naval Architecture & Marine Engineering Study Program have been accredited by AUN. In 2017 Department of Chemical Engineering have been accredited by JABEE (Japan Accreditation Board for Engineering Education) & in 2018 Chemical Engineering & Bioprocess Engineering Study Program have been accredited by IABEE (Indonesian Accreditation Board for Engineering Education).

In 2018 Environmental Engineering Study Program have been accredited by AUN. In 2019 Computer Engineering Study Program have been accredited by AUN

Undergraduate Regular Class Program

The Undergraduate Program in Universitas Indonesia focuses on producing graduates with the following qualifications:

- Having knowledge of the basic science and skill in particular field of study.
- Being able to implement the science, knowledge and skill acquired in accordance with their respective field of study.
- Being able to keep abreast the development and growth of science and technology.

The aim of Undergraduate Program in FTUI is to produce graduates with competencies set by the Accreditation Board for Engineering and Technology (ABET) and Washington Accord Based as follow:

- Being able to implement the basic science, the basic science of engineering, and technology.
- Being able to design and conduct experiments and data analyses.
- Being able to design system and its components.
- Understanding the professional responsibility and ethics.
- Being able to work together in a multidiscipline group.
- Being able to identify, formulate and solve engineering problems.
- Being able to communicate effectively.
- Having broad knowledge and understand of the technological impacts of their projects in both local and global scale.
- Having the motivation and ability to learn continuously.
- Having knowledge of the latest engineering problems.
- Being able and skilled in using the latest engineering methods.
- Producing graduates from the Architecture Study Program with the competence in accordance to the National Architectural Accrediting Board (NAAB).

Besides ABET, FTUI has also received accreditation from the IABEE (Indonesian Accreditation Board for Engineering Education) based on the IABEE Criteria. IABEE Common Criteria (CC) are established as a framework to perform accreditation of higher education programs. These CC comprise of elements that must be fulfilled by the Study Program to be accredited. And the criteria are as follows:

- Programs to be accredited are four-year engineering Bachelor Programs or other higher education programs which IABEE considers as equivalent.
- The Program is not restricted to single Programs operated by a Department or Faculty. A Program may be formed and/or operated by multiple Departments / Faculties. Programs may include matriculated learning activities outside of its home campus, in conjunction with other higher education institutions.
- In cases where a Program is offered as Non Regular classes, evaluation by IABEE shall encompass all Non Regular classes. In cases where multiple Programs of the same nomenclature are offered in multiple locations by the same Program-Operating Institution (such as Programs established according to the Program Studi di Luar Kampus Utama (PKSDU) scheme as defined by the Indonesian Ministerial Regulation of Peraturan Menteri Riset, Teknologi, dan Pendidikan Tinggi No. 1/ 2017), evaluation by IABEE shall treat the Non Regular Programs as separate entities.
- The Program shall define the profile of autonomous professionals to be fostered, and define the knowledge, skills, and attitudes as Learning Outcomes that graduates are expected to master upon completion of their study.
- The Program should promote self-reliance, welfare, advancement, fairness and justice for the national and global community in general, based on science, technology, culture and sustainable utilization of natural resources.
- The Program is required to design the curriculum systematically to ascertain the achievement of Program Learning Outcomes. Student and faculty should be aware of these Learning Outcomes.
- The Program must disclose its Learning Outcomes to the public. The Program is also required to engage in continual improvement and at the same time to consider the sustainability of operation.
- Common Criteria consist of 4 elements, following the management approach of PDCA (Plan-DoCheck-Act) continual improvement cycle. Criterion:
 1. describes the orientation of the graduate competence,
 2. explains the learning implementation,
 3. explains the assessment of the expected Learning Outcomes,
 4. explains the continual improvements.
- In addition to these Common Criteria, Program

seeking for accreditation shall fulfill also the Category and Discipline Criteria, as well as eligibility requirements and accreditation policies stipulated in the Rules and Procedures of Evaluation and Accreditation (RPEA).

Undergraduate Non Regular Class Program

To improve the capacity usage for educational purposes, Universitas Indonesia has opened the Undergraduate Non Regular Class Program. This program is provided with the same facilities and curriculum as those provided for the Undergraduate Regular Program. However, only eight out of thirteen study programs are available for future students to choose from.

The classes are held in FTUI Depok from morning to late evening, different from the classes of the regular program which are held from morning to early evening.

The Undergraduate Non Regular Program allows all high school graduates from any years to register to the program. This differs from the Undergraduate Regular Program which limits registration to students with a maximum graduation time of three years. This arrangement makes this program available to all high school graduates from any years to pursue their Bachelor's degree.

Unlike the students of the Undergraduate Regular Program, the students of the Undergraduate Non Regular Program are required to pay full education fees in accordance with the listed fees. This means that they are not allowed to apply for Biaya Pendidikan Berkeadilan (BOP-B), i.e. a cost reduction program allocated to their Regular Program classmates. The graduation requirements and accreditation for the Undergraduate Regular Program also apply to the Undergraduate Non Regular Program.

International Undergraduate Program (Double-Degree & Single Degree)

Since 1999, the Faculty of Engineering has established an international undergraduate program in engineering (the double-degree program) with the following renowned Australian higher education institutions: Queensland University of Technology (QUT), Monash University, Curtin University of Technology, Deakin University, and the University of Queensland. Students can also continue their studies to the University of Duisburg Essen (UDE), Germany. Graduates from this international undergraduate program will be awarded both a

Bachelor of Engineering degree from our University partner and a Sarjana Teknik degree from the Faculty of Engineering of UI when they return to FTUI and fulfill certain requirements. The double degree cooperation with QUT involves the study programs of Civil Engineering, Mechanical Engineering, Electrical Engineering, and Architecture. The double degree cooperation with Monash University involves the study programs of Metallurgical and Materials Engineering and Chemical Engineering. The double degree cooperation with Curtin University involves the study programs of Chemical Engineering, Architecture, Metallurgical and Materials Engineering, and Electrical Engineering, with other study programs to follow. The double degree cooperation with the University of Queensland involves the study programs of Civil Engineering, Mechanical Engineering, Electrical Engineering, Chemical Engineering, and Metallurgical and Materials Engineering. The double degree cooperation with UDE involves the study programs of Electrical Engineering and Metallurgical and Materials Engineering. This international undergraduate program provides high quality engineering education in the international level.

Before continuing their studies at our partner university, students should fulfill the minimum English proficiency in accordance with our partner university's requirement as stated in the Dean's Decree No. 740/D/SK/FTUI/IX/2018.

Since 2011, students have also had a choice to continue their final two years at FTUI as part of the newly opened Single Degree International Program. The undergraduate single degree international program was launched 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 semesters of studies at one of our partner universities like their classmates who wish to pursue a double degree. However, students of the single degree program are required to study abroad for at least one semester at an overseas university with academic link or cooperation with Universitas Indonesia. The list of universities can be found here: <http://international.ui.ac.id/international-engagement.html>. The aims are to widen the international perspective of the students, to provide students with the experience of studying in an overseas university, to enhance students' language capability, and to enhance students'

Before finishing their study, students should fulfill the minimum English proficiency level as the set forth in Dean's Decree No. 3 year 2019: achieved a minimum IELTS score of .0 with no bands lower than 5.5 or TOEFL iBT score of 75 with no bands lower than 17.

Undergraduate Non Regular Class Program (Diploma Track)

The Undergraduate Non Regular Program (Diploma Track) at FTUI was initiated in 1993 and it was named the Extension Program. At the beginning, the program was offered only by four Study Programs (Civil, Mechanical, Electrical, and Metallurgy Engineering). In 1995 the program was also opened by 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 closed. However, the faculty still provides future FTUI students that are graduates from the Diploma Program with the opportunity to continue their education at FTUI Undergraduate Program. Students are now able to apply through the Undergraduate Non Regular Program (Diploma Track) by using the Credit Transfer System. The number of credits acknowledged will be decided by their respective Departments.

The Undergraduate Non Regular Program is a full time academic program where students are expected to be full time students in campus. This is due to the schedule set for the program which starts from morning to afternoon. There are six Study Programs available to choose from: Civil Engineering, Mechanical Engineering, Electrical Engineering, Metallurgy and Materials Engineering, Chemical Engineering, and Industrial Engineering.

Professional Program

Professional Program for Architects

This one-year professional program is intended to provide graduates who have the ability to design with necessary professional skills and competence based on policies (code compliance) to be qualified architects. Graduates of this program may work in various fields within the construction industry as an executive architect or construction supervisor. Graduates may also work as researchers and lecturers at educational institutions associated with the field of architecture. Besides that, graduates may also choose to work in the fields of urban design, real estate, building maintenance, housing and settlements, and the environment, as well as becoming assessors for project feasibility studies or building managers. They might also work in the industry of building materials and elements or in the government sector and take charge of projects related to urban design, building, and development in the area of built environment.

Professional Program for Engineers

The aim of this Professional Program for Engineer is to fulfill the need for graduates with high competence in engineering, in accordance with the Engineer Law.

The Professional Program for Engineer aims to produce engineers with the following characteristics:

- Having an understanding of an engineer's code of ethics and engineer's code of conduct
- Having the necessary technical skills of an engineer, including consultation service, pre-design creation, licensing process, the development of design and completion of various technical and bidding documents.
- Having a sound understanding of code of compliances, including those related to providing service to clients, complying with current regulation, and dealing with various engineering problems such as those related to building construction and mechanical or electrical engineering

The Professional Program for Engineers Study Program is a higher education program which students may take after completing their undergraduate program in order to improve their engineering skills. Completing the Professional Program for Engineers is a prerequisite to acquire the title of an Engineer and to submit an application for professional certification. This program is a continuation of the existing undergraduate program in which graduates are expected to possess certain academic abilities: critical thinking (analytical and synthetic) and the ability to perform creative design. The undergraduate program is designed to be completed in 4 years (8 semesters) with 144 credits. To fulfill the requirements for obtaining the title of an Engineer, a graduate is required to pursue a further professional education for a minimum period of 1 year with 24 credits to complete. The composition of the curriculum of the Professional Program for Engineers is 84% engineering practices, including internship in any industry, case studies, and problem solving, and 16% face-to-face classroom lectures.

In the Ministry of Research, Technology, and Higher Education's Regulation, it is stated that the Professional Program for Engineers is a higher education program as a continuation of the undergraduate Bachelor's program designed to improve students' engineering competency. Graduates of this Professional Program for Engineers Study Program will be awarded with an Professional Engineer Certificate from the university and is entitled to use the professional engineering degree "Ir."

A person with a Professional Engineer Certificate is eligible to take the Professional Engineer

Competence Examination held by a professional certification institution. Engineers that have passed this Professional Engineers Competence Examination will be awarded a Certificate of Competence as a professional engineer. Certificate of Competence is an important document which enables an individual to work as an Engineer, and this is also a requirement for obtaining the Engineer Registration Certificate issued by Persatuan Insinyur Indonesia (PII), an Indonesian professional engineers' association.

Master Program

The Master's Degree Program of the Faculty of Engineering, Universitas Indonesia, was opened in 1992 with four study programs: Civil Engineering, Mechanical Engineering, Electrical Engineering, and Metallurgical Engineering. In 2000, the faculty opened the Master's Degree Program for Chemical Engineering (from the Gas Engineering Study Program in the Metallurgical Engineering Department), Industrial Engineering (from the Industrial Management Study Program in the Mechanical Engineering Department), and Architecture.

Each Study Program in the Master's Degree Program is led by a Head of Study Program held ex-officio by the Head of the Department. Each Department has one or more specializations to provide in-depth and more specific engineering knowledge for each student of the said study program.

Types of Classes for Master Program:

- Regular Class Program is held full time from Monday – Friday in FTUI Campus, Depok.
- Special Class Program is held at specific with the following details:
 - Special Class program for Metallurgical & Materials Engineering: Saturday (08.00 am– 07.00 pm) in FTUI Campus, Depok.
 - Special Class program for Industrial Engineering: Friday (05.00 pm – 09.00 pm) and Saturday (08.00 am – 05.00 pm) in FTUI Campus, Salemba.
 - Special Class program for Energy System Engineering, Biomedical Technology, and other Special Class program: Monday – Friday (05.00 pm – 09.30 pm) in FTUI Campus, Salemba.

Doctoral Program

FTUI Doctoral program was officially opened in 2000 with two study programs: Civil Engineering

and Electrical Engineering Doctoral Programs. This was followed by the inclusion of the Opto-electrotechnique and Laser Application study programs into the Postgraduate Program of FTUI. The Mechanical Engineering study program was officially opened in 2006, while the Metallurgical and Materials Engineering and Chemical Engineering Doctoral Programs were opened in 2007.

In 2009, the Department of Architecture opened the Architecture Doctoral Program. In 2011, the Opto-electrotechnique and Laser Application study programs were closed and merged into the Electrical Engineering study program. Department of Industrial Engineering opened the Industrial Engineering Doctoral Program in 2014. Each Doctoral study program is led by a Head of Study Program which is held *ex-officio* by the Head of the relevant Department at the Faculty of Engineering UI. FTUI Doctoral study programs have one or more focuses of study to provide more specific knowledge of a particular engineering field for all students of the program.

CHAPTER 2

ACADEMICS SYSTEM AND REGULATION



Academic System and Regulation

General

Teaching and Learning Activities

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

Semester Credits Units (SKS)

Education in FTUI is provided in a variety of ways, including lectures, assignments (e.g., calculation tasks, planning, designs), practical work, seminars, lab, studio, and research for thesis writing. All educational activities that must be undertaken by a student to earn a bachelor's degree are contained within the academic loads and measured in semester credit units (SKS).

- Semester Credit is the measurement of the learning experience obtained by students in 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 of 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.
- One Semester Credit of online learning is 170 (one hundred seventy) minutes per week per semester.
- One semester is an effective learning process for at least 16 weeks of lectures or other scheduled activities and additional activities. Also included in the schedule is one week of

midterm examination and another one or two weeks of final examination.

- To earn a bachelor's degree, a student must complete all educational activities with a total academic load of 144 credits spread 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 a minimum of 18-20 hours of scheduled interactions 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 (6,25%), Basic Engineering Subjects (15-20%), Basic Skills Subjects (30-35%), Core Subjects (35-40%). Subjects are categorized as either compulsory subjects and electives. They can be taken across departments or faculties.

Grade Point Average

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

The calculation is made by multiplying the number of credits and the letter grade for each course, divided by the number of credits.

$$IP = \left(\frac{\sum_{MA} (\text{Bobotnilai} \times \text{sks})}{\sum_{MA} \text{sks}} \right)$$

Semester Grade Point Average (SGPA)

Grade Point Average (GPA/IPK)

If the calculation involves the grade point values of all subjects taken during the educational program period, the result is called the Cumulative Grade Point Average (CGPA), which is used as a basis for study evaluation. Courses taken into account are the ones listed in the Study Plan Form (FRS). CGPA 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 a letter grade of 'BS', 'I', or 'TK'.

Academic Performance Evaluation

Assessment of academic ability is performed on an ongoing basis by CLO (Course Learning Outcomes). There is at least one CLO derived from the Expected Learning Outcome (ELO) for each subject. Each CLO might be derived into several sub-CLO where each sub-CLO consists of several lecture materials and types of learning evaluations. A student will be assessed on their academic ability if they meet 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 every semester, students can download Semester Grade Record as a report of their academic performance from SIAK NG (<https://academic.ui.ac.id/>). Assessment of study efficacy is carried out using letters and grade points according to Table 2.1.

The highest grade is 'A' with a grade point of 4.00, and the minimum passing grade of a course is 'C' with a grade point of 2.00. A lecturer may assign an 'Incomplete' (I) grade if a student has not made a reasonable attempt to complete major session assignments or laboratory projects. The lecturer should make a reasonable effort to inform the student as early as possible that an essential part of the session work is incomplete. The 'I' mark should be changed to another

grade within one month; otherwise, it will automatically change to 'E' grade. The 'T' mark is given for no attendance in the exam. The 'BS' mark is given for special lecture (such as internship, seminar, and final project) that has not been completed. These 'BS' courses are not taken into account in the calculation of Semester Study Unit, SGPA, and CGPA.

Table 2.1. Grade Value and Point

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

Length of Study and Academic Load

Undergraduate Program

The academic load students can take proposed by the students for the approval of the Academic Counselor based on their previous Semester Grade Point Average (SGPA) as stated in the Study Plan (FRS). Students must take the entire allocated credits and courses during their first semesters. The minimum academic load for the Undergraduate Program is 144 (one hundred and forty-four) credits, while the maximum academic load is 160 (one hundred and sixty) credits, including the final project. The entire academic load can be completed in a minimum of 7 (seven) semesters and maximum of 12 (twelve) semesters.

As for the second semester, these following rules apply:

- Students can take all credits load allocated for the second semester according to the structure of the applicable curriculum.
- Students can take more credits from the credit load allocated for the second semester if the SGPA obtain in the 1st semester is in accordance with the provision of the maximum credit load amounts shall follow the provision in the Maximum Credit Load Table.

From the third semester onward, the maximum credit load allowed to be taken is determined by the SGPA of the previous Semester (not including the short semester). It follows the provision of Maximum Credit Load as shown in Table 2.2 with respect to course prerequisites (if any). If necessary, the Academic Advisor (PA) can add a maximum of 2 extra credits upon the approval of the Vice Dean.

Master Program

The academic load in the FTUI's Master Program curriculum is set at 40-44 credits after finishing

the Undergraduate Program. The length of study is scheduled for 4 (four) semesters and can be completed in minimum 2 (two) semesters and a maximum of 6 (six) semesters; exclude short semester.

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

SGPA	Maximum Credit
< 2,00	12
2,00 – 2,49	15
2,50 – 2,99	18
3,00 – 3,49	21
3,50 – 4,00	24

The student's academic load is proposed by the students for the Academic Counselor (PA) approval based on their last semester SGPA as stated in the Semester Grade List (DNS). Provisions on the academic load are as follows:

- AA semester's academic load is registered by a student as they carry out online registration according to the predetermined schedule. Students are required to take all subjects as allocated in the first-semester curriculum.
- For students with SGPA less than 2.50, a provision stating that the number of credits taken for the following semester does not exceed nine credits is applicable.
- The maximum number of credits that can be taken on the Master Program is 18 (eighteen) credits (for Regular Master Program) per semester.
- Any Exemption from the provisions of academic load should be with the permission of the Vice Dean.

Matriculation for Master

The Matriculation Program is aimed at synchronizing the students' ability to achieve the minimum requirements for continuing education in the Master Program of FTUI. The program is compulsory for students coming from a four-year diploma program (D4) or graduates from a non-linear undergraduate study program.

Matriculation is achieved by taking classes of subjects required by each Faculty/Study Program within the Undergraduate Program curriculum. The maximum allowed credit load for this Matriculation Program is 12 (twelve) credits, which can be completed in 2 (two) semesters (6 credits in the first semester and 6 credits in the second semester). Students are allowed to continue their study in the Master Program only if they pass all matriculation subjects in a maximum

2 (two) semesters with a matriculation GPA of 3.00 (three points zero).

Fast Track (Master – Doctoral Program)

Fast Track (Master – Doctoral Program) is an educational program organized to accelerate students who have excellent academic ability to complete their studies in the Master Program and Doctoral Program in the same field of science within a maximum of 10 (ten) semesters.

To take part in the Master-Doctoral Fast-Track Program, students must fulfill the following requirement:

- have obtained 18 (eighteen) credits with a minimum GPA of 3.50 (three point five zero) at the end of the second semester.
- The study period for the Master-Doctoral Fast-Track Program is a maximum of 10 (ten) semesters.
- Study Load on the curriculum of the Master-Doctoral Fast-Track Program, as follows:
 - For the Master program, that is according to the total credits in the master study program including 12 - 16 (twelve to sixteen) the credits include elective courses taken from the compulsory doctoral program;
 - For the Doctoral program, a minimum of 50 (fifty) credits, including 12 - 16 (twelve to sixteen) credits, are courses that are recognized through credit transfers.

Students who cannot complete their education within 10 (ten) semesters only get a Master's Degree.

Doctoral Program

The academic load in the FTUI's Doctoral Program curriculum is set at 50 credits after finishing the Master Program. The students register a semester's academic load through online academic registration during the predetermined schedule. New students are required to take all subjects as allocated in the curriculum for the first and second semesters. Students must retake any research courses with a 'BS' grade from previous semesters. The students propose students' academic load for each semester for the approval of the Academic Counselor (PA) or the Doctorate Promoter.

The length of study is scheduled for 6 (six) semesters and can be completed in a minimum of 4 (four) semesters and a maximum of 10 (ten) semesters. Students in the Doctoral Program may be granted an extension of maximum 2 (two) semesters if they have never received an extension before, have

achieved a minimum grade of 'B' for research result examination, and have obtained a recommendation from their Promoter and a guarantee that they will complete their study within the granted extension period. The proposal for such extension is regulated in a Rector's Decree based on the proposal of the Dean.

Undergraduate Final Project (Skripsi)

Undergraduate Final Project (Skripsi) is a compulsory course for undergraduate students of FTUI taken to complete their study and earn a degree in engineering. The course is the application of science that has been obtained student has studied, in the form of a scientific paper, engineering design, assembly or models and accessories. It is equivalent to other skills courses and tailored to the scope of each Study Program. The following requirements, both academic and administrative, must be met before students are allowed to start writing their undergraduate thesis:

- The Undergraduate final project 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 Final Project can be taken in both odd and even semesters in the running academic year. On SIAK NG, students must fill out the name of their Skripsi Supervisor and the title of their Skripsi to be verified by the Vice Head of Department. At the end of the semester, the supervisor will announce the Skripsi grade on SIAK NG and change the title of the thesis (if necessary). The completed undergraduate final project must be submitted in the form of a hardcover book, and students must upload their final revision in a pdf file to UI-ana (lib.ui.ac.id/unggah). The undergraduate's final project must be assessed in an undergraduate thesis examination by the Supervisor and examiners assigned by the Head of Department.

Thesis (Master Program)

The thesis is a report of research findings 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 theory using a certain method. The thesis should be written in Bahasa Indonesia with English abstract. For Master Program students who are given the opportunity to conduct research and thesis preparation abroad, they are

allowed to write the thesis in English with a Bahasa Indonesia abstract while still following the appropriate format stated in the Final Project Writing Guidelines of Universitas Indonesia. Exemption from this rule applies only to Study Programs in collaboration with universities abroad, as stated in the cooperation charter.

Requirements for a student to start writing a Thesis are:

- The student's thesis has been registered in the Study Plan Form (FRS) every semester.
- The Head of Study Program has designated a lecturer to be the student's Thesis Supervisor.

Students are responsible for all thesis research costs. Students can actively meet with any of their lecturers as potential supervisors to request a thesis topic. In addition, in the middle of the second semester, the Head of Study Program can start announcing thesis topics from which the students of the Master Program can choose to prepare their thesis proposal in the form of a seminar. The Head of Study Program will also announce a list of Thesis Supervisors assigned to guide the students in writing and finish the approved topic. The thesis examination committee consists of a committee chair and a minimum of 3 or a maximum of 5 examiners, including the Thesis Supervisor. Responsible for the implementation of the thesis writing is the Thesis Coordinator in each Department. Thesis counseling should be provided by a maximum of two people, the main Supervisor and the second Supervisor. The main Supervisor should be the permanent university lecture holding a Ph.D degree. The second Supervisor is the university permanent lecture or temporary lecturer or expert from national or international institutions holding a Ph.D. or Master's Degree with professional certifications and qualifications equal to level nine (9) of the Indonesian Qualifications Framework (KKNI).

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

- The thesis has been registered in Study Plan Form [FRS] in the said semester
- The thesis has been declared eligible for examination by the Thesis Advisor
- The thesis that 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 is carried out under the guidance and evaluation of a Promoter with the following qualifications: a full-time university lecturer; a Professor or Doctor with an academic title of Associate Professor; have expertise relevant to the dissertation topic, and 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 acknowledged by a team of experts appointed by the Academic Senate of Universitas Indonesia. The 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. The Co-promoter must have the following qualifications: a full-time or a part-time lecturer or an expert from another institution; hold a minimum title of Doctor/ Ph.D with an academic title of at least Senior Lecturer, and have expertise relevant to the dissertation topic.

Internship for Undergraduate Student

The internship is an out-of-campus activity that encourages students to apply their scientific knowledge in a real work situation. The requirements for internship are set by each Department, and it accounts for 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 Double Degree Undergraduate Program, students are required to complete internships when they are in partner universities (except in UDE, Germany). For example, in Australia, the internship is one of the requirements set by the Institution of Engineers Australia (IEAust) to obtain an accredited B.E. (Bachelor of Engineering) Degree. The internship is a good opportunity for students to apply their skills and build networks in the industry. It is strongly suggested that students do their internships in partner universities. However, if they cannot do so, they are allowed to have their internship in Indonesia with prior permission from the partner universities.

Supplementary Exam

Students are allowed to take a supplementary examination for midterm and final examinations on the following conditions: sick, grievance, or representing Universitas Indonesia in a competition. Students with a sickness excuse are obliged to submit an application for supplementary exam signed by their parents/guardian and a medical certificate from a doctor or hospital that treats them; students with grievance or death in the family (death of the father, mother, older or younger siblings) are obliged to

submit an application for supplementary exam signed by their parents/guardian; students representing Universitas Indonesia in the competition are obliged to submit a Letter of Assignment/Letter of Reference stating the competition in which they represent UI. The supplementary exam can only be taken with 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 the number of credits a student may obtain from a university after an evaluation process by a Credit Transfer Team in each Faculty/ Department in the University. Students who have registered and studied at an undergraduate study program or other equivalent education programs, whether in Universitas Indonesia or 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 as the courses listed in the curriculum for the Undergraduate Program in FTUI, (ii) the academic record must date back not more than 5 years from the credit transfer application date, (iii) if the academic record is obtained from a university other than 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 the Undergraduate Program is 50% of the total academic load that a student is required to complete in accordance with the curriculum of the Study Program he/ she is currently studying in. The courses transferred will be indicated with a 'TK' mark in the academic transcript.

The credit transfer procedures are as follows: (i) The student submits a letter requesting credit transfer to the Head of the designated Department; (ii) The Head of Department will form a team to recommend which courses the student has previously taken can be transferred; (iii) The recommendation will be sent to the Dean of FTUI; (iv) The Dean of FTUI will issue a Credit Transfer Decree; and (v) The Faculty's Center of Administration will assign a 'TK' mark to all the relevant courses in the student's SIAK NG account.

Credit Transfer for Parallel Class Students of Diploma Graduates

As of 2011, all Extension Programs in FTUI are merged into Parallel Classes in the Undergraduate Program. For diploma graduates registered as students in these Parallel Classes, credits obtained from the previous diploma program will be transferred in blocks of credits equivalent to the number of the first

and second semester credits in their study program. Students begin their study in the third semester by taking a full academic load according to the package provided for the third semester. Afterward, they can take credits according to their SGPA 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 programs abroad, such as in Japan, Korea, Taiwan, Singapore, and many other countries. Student exchange programs generally last for 1-2 semesters and are 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. Students 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 (Undergraduate – Master Program)

FTUI 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's 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 a 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:

1. 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.
2. For the Master Program is 40-44 credits including the 16-22 credits from subjects mentioned in point an above and are acknowledge through credit transfer.

If a 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 elective subjects in their completion of the Undergraduate Program and cannot be acknowledged 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:

1. Have a minimum GPA of 3.50 with a total of 120 credits (until 6th semester).
2. Have a minimum Institutional TOEFL/EPT score of 500 (students may use the score from the EPT test they took as a new student in FTUI)
3. Have a high motivation for research

Procedure for Fast Track Program:

1. 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).
2. Students who are interested in participating in the Fast Track Program are required to fill out the Registration Form.
3. The Fast Track Registration Forms will be evaluated by a team headed by the Head of Department.
4. 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 Form. The student's Study Plan Form 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.

5. Undergraduate thesis and thesis of the student are expected to be of continuous research to maximize knowledge, experience and quality research result.
6. 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.

Fast Track (Undergraduate – Doctoral Program)

Fast Track (Undergraduate – Doctoral Program) is an educational program organized by the University to accelerate students who have an excellent academic performance to complete their studies in the Undergraduate Program and Doctoral program in the same study field at the maximum of 12 (twelve) semesters.

Merdeka Belajar Kampus Merdeka Program

Merdeka Belajar Kampus Merdeka Program is a policy of the Minister of Education and Culture, which aims to encourage students to master various sciences useful for entering the world of work. Merdeka Campus provides an opportunity for students to choose freely several courses they will take. The implementation of Merdeka Belajar – Kampus Merdeka Program in the curriculum starting on 2020/2021 Academic Year. The Merdeka Belajar – Kampus Merdeka Program is the right for all undergraduate study programs.

Fulfillment of time and study load for undergraduate students or applied undergraduate programs can be implemented by:

- a. follow the entire learning process in the study program to the period and study load; or
- b. follow the study program's learning process to fulfill part of the time and learning load, and perform the rest learning process outside the study program.

The student may apply for the following elective courses scheme:

- a. Fast-Tack program with a minimum of 24 (twenty-four) and a maximum of 54 (fifty-four) credits of choice focused on elective courses and postgraduate level courses at the same field of science as the field of science at the bachelor level.
- b. Major-Minor Program with a minimum of 24 (twenty-four) and a maximum of 54 (fifty-four) credits the choice is focused on one different Study Program (across Study Programs/cross faculties/cross clumps of knowledge).
- c. Double Major Program with a minimum of 24 (twenty-four) and a maximum of 54 (fifty-four) credits the choice is focused on one different Study Program (across Study Programs/cross faculties/cross disciplines) plus the rest of the Mandatory courses in the second Study Program to fulfill the minimum Expected Learning Outcome of the second study program.
- d. Independent study Choice with a maximum of 54 (fifty-four) Optional credits are used for outside learning activities study program as stated in the Policy Merdeka Learning - Merdeka Campus.
- e. The selection of the selected subject application scheme is consulted with the Study Program.

The form of learning activities that can be carried out outside the Study program include:

- a. Student Exchange
- b. Internship/Work Practice
- c. Teaching assistant in education unit
- d. Research
- e. Humanity project Proyek
- f. Entrepreneurial activities
- g. Independent Study/Project
- h. Building a Thematic Real Work Village/Lecture

The number of hours of learning activities is 45 Hours per week for one credit. Implementation of activities must be accompanied by lecturers advisor. The conversion of activities to credits will be carried out by faculty evaluators and verifiers, based on the number of hours and type/form of activities. The evaluator is a lecturer in the study program from the student or other Study Programs in the Faculty assigned to assist and monitor student activities. Verificators are officials at the Faculty level who are responsible for Education and/or Student Affairs in

charge of perform verification, assign weighting, and propose assessment of student performance in student activities.

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

- **Administrative registration in Universitas Indonesia**
July - August
- **Academic registration in Universitas Indonesia**
August
- **Course period**
August – January
- **Mid-semester examination**
October
- **End of Semester Examination**
December - January
- **Deadline for grade assignment in SIAK-NG**
January
- **Departmental Judicium**
1st: October
2nd: January
- **Faculty Yudicium**
1st: November
2nd: January
- **Graduation**
February

Term 2

- **Administrative registration in FTUI**
January - February
- **Academic registration in FTUI**
January - February
- **Course Period and examination**
February - May
- **Mid-semester examination**
March - April
- **End of Semester Examination**
May
- **Graduation**

August

Short Semester

- **Administrative Registration**
June
- **Academic Registration**
May - June
- **Course period**
June - August
- **Mid-semester Examination**
July
- **End of Semester Examination**
August

Note:

*) Schedules are subject to change

Note:

1. Short Semester course period is held for 8 weeks, including mid-semester and final semester examinations.
2. 2 credit courses consist of two 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.
3. 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.
4. A student can take up to a maximum of 12 credits during the short semester.
5. Courses offered are determined by the Department.
6. 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.
7. 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.
8. 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 dead line will not be registered at that particular semester will be included toward student's allowed length of study. A 50% penalty will be imposed to students who do not make payment on time. 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 Study 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 Form particularly in selecting courses and in solving their academic problems
- Monitoring and evaluating student's academic performance during their period of study.

Students should login to <https://academic.ui.ac.id> using username and password provided by the Office of Direktorat Sistem & Teknologi Informasi (DSTI) 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 are not followed to take part in the academic activities in the relevant semester, which is counted towards their length of study
3. Students who are not active as referred to in points (1) are not charged with tuition.
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.

Exception Administrative Registration

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

- The students are required to obtain the approval of 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 relevant semester.
- The approval will be used by the students for paying the tuition fee manually.
- The 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 the minimum GPA as required at the end fourth semester for the 2+2 program;
2. Have 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
3. Program curriculum for semester 1-4.
4. Achieve the minimum IELTS or TOEFL scores as

required.

5. If their GPA is less than required, the students must stay at UI and repeat some subjects to improve their GPA, while administratively and academically registered at FTUI.
6. If their 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
Queensland Univ. of Technology	3.0	IELTS minimum 6.5 with no band lower than 6 TOEFL iBT in accordance to partner university's requirement
Curtin University		
The Univ. of Queensland		
The Univ. of Sydney		
Monash University	3.2	

English Language Requirements for Undergraduate International Program Single Degree

Students of the Undergraduate International Program Single Degree are required 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	6.0	No bands lower than 5.5
TOEFL iBT	75	No bands lower than 17

This English Language Certificate is one of the requirements before they may proceed to have their Undergraduate Thesis/ Final Project Exam.

1. Student choose a Partner University
 - Find out list of UI's Partner Universities
 - Information on Study Abroad/ Student Exchange Information from International Office UI through <http://international.ui.ac.id>
2. Student contacted the selected partner University for Information on:
 - List of subjects offered and course description
 - List of requirements/documents needed.
 - Application and Tuition Fees.
 - Other Documents needed.
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:
 - Name and Student ID of student participating in the Study Abroad/Student Exchange Program
 - Name of Partner University and length of study of said program
 - List of subjects that the students will take at Partner University.
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:
 - Application Form
 - IELTS/TOEFL iBT
 - Other language requirement
 - Reference Letter and Academic Transcript from the Faculty.
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

Procedure for Study Abroad/ Student Exchange to

Partner University for Undergraduate International Program Single Degree.

Graduate Predicate

Students are considered to have passed the Undergraduate Program and will earn a Bachelor's 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 compulsory courses and acquired a minimum of 144 credits in accordance with the applicable curriculum with 'C' as the lowest grade and completed all 8-semester scheduled academic load within 8-12 semesters; have completed all administrative obligations, including returning all borrowed library and laboratory collections; and have completed all obligations within their study period and/or all assignments given in accordance with the curriculum of the Study Program (including revising Final Project) with a GPA of ≥ 2.00 (two point zero). Honors predicate for a graduate is determined by the student's CGPA as follows: Summa cum laude (3.90-4.00), Cum Laude (3.61-3.89), Very Satisfactory (3.25-3.60), Satisfactory (2.76-3.24). For an undergraduate student to graduate Cum Laude, he/she must finish his/her study within 8 (eight) semesters with minimum GPA 3,51 and without retaking any courses.

Students are considered to have passed the Master Program and will earn a Master of Engineering or Master of Architecture Degree if they have passed all the required 40–44 credits; achieve a ≥ 3.00 GPA with 'C' as the lowest grade; do not exceed the maximum study period; and have met all administrative requirements. The honors predicate for a graduate is determined by the student's CGPA as follows: Summa cum laude (3.95-4.00), Cum Laude (3.76-3.94), Very Satisfactory (3.51-3.75), Satisfactory (3.00-3.50). For a Master Program student to graduate Cum Laude, his/her length of study must not exceed 4 (four) semesters with minimum GPA 3,76 and without retaking any courses.

Students are considered to have passed the Doctoral Program and will earn a Doctoral Degree if they have passed all the required 50 credits; achieve a minimum GPA of 3.00 with minimum 'C' for in-class courses and minimum 'B' for research courses; do not exceed the maximum study period; and have met all administrative requirements. Honors predicate for a graduate is determined by the student's CGPA as follows: Summa cum laude (3.95-4.00), Cum Laude (3.76-3.94), Very Satisfactory (3.51-3.75), Satisfactory (3.00-3.50). For a Doctoral Program student to graduate Cum Laude, his/her length of study must

not exceed 8 (eight) semesters without retaking any courses or academic leave (except for a student with outstanding achievement based on the Promoter and examiner team's judgment, the length of his/her study must not exceed 10 (ten) semesters). The mark 'BS' is not counted as course repetition. If a student's GPA is within the 3.76–4.00 range but he/she fails to meet the other requirements, he/she will be awarded a 'Very Satisfactory' predicate.

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 at least 120 credits with a minimum of C at the end of their tenth semester;
- Attain all required credit with a minimum of C at the end of their twelfth semester;

Or:

- Have the following issues: 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.
- It was proven to be in violation of rules or regulations that caused the student to lose his right as FTUI student.
- Deemed unfit to continue their study based on consideration from a team of Medical Doctors appointed by the Head of the University.

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

Master's 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 9 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 Vice Dean with a copy to the Head of the Department.

Doctoral Program

The Maximum length of study to earn a Doctoral degree in FTUI is 10 (ten) semesters, starting from registration to graduation. **Students of the Doctoral Program (Class and Research)** will lose their right to continue to study (dropping out) if:

- Students do not register academically and administratively for two consecutive semesters, thus automatically being considered to have resigned from UI.
- Students fail to obtain a minimum of ‘B’ for their research proposal examination or a similar exam at the end of their fourth semester.
- Students fail to complete a minimum of 50% of their research based on the judgment of the Promoter Team by the end of their sixth semester.
- Students fail to complete a minimum of 75% of their research based on the judgment of the Promoter Team by the end of their eighth

semester.

- At the end of the study period (ten semesters), students fail to complete 4 points above.
- Students fail to do the following by the end of their study period of ten semesters: producing 1 (one) scientific paper based on research for their dissertation as the main author with an option to work with the Promoter Team as their co-writer that has been accepted to be published in an indexed international journal (8 credits); submitting proof of compliance with the foregoing requirement as part of the requirements for promotion exam, and submitting 1 (one) dissertation and participating in a promotion exam as the final step of the Doctoral Program (6-8 credits).
- Students exceed the maximum length of study (10 semesters).
- Students are proven to be in violation of rules or regulations that causes the students to lose their rights as an FTUI student.

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 do not register academically and administratively for two consecutive semesters, thus automatically being considered to have resigned from UI.
- Students fail to obtain a minimum of ‘B’ for their research proposal examination or a similar exam at the end of their fourth semester.
- Students fail to complete a minimum of 50% of their research based on the judgment of the Promoter Team by the end of their sixth semester.
- Students fail to complete a minimum of 75% of their research based on the judgment of the Promoter Team by the end of their eighth semester.
- At the end of the study period (ten semesters), students fail to complete 4 points above.
- Students fail to do the following by the end of their study period of ten semesters: producing 1 (one) scientific paper based on research for their dissertation as the main writer that is presented at an international scientific conference and published in the proceedings as a full paper (6 credits); producing 1 (one) scientific paper based on research for their dissertation as the main writer with an

option to work with the Promoter Team as their co-writer that has been accepted to be published in an indexed international journal (8 credits); submitting 1 (one) scientific paper that has been accepted to be published in a nationally accredited journal; submitting proof of compliance with the foregoing requirement as part of the requirements for promotion exam; and submitting 1 (one) dissertation and participating in a promotion exam as the final step of the Doctoral Program (6-8 credits).

- Students exceed the maximum length of study (10 semesters).
- Students are proven to be in violation of rules or regulations that causes the students to lose their rights as an FTUI student.

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.

Academic Leave

Students who wish to be away from their academic endeavors at FTUI for one to two semesters, but intend to return to FTUI are eligible for an academic leave of absence. Leave of absence can only be given to a student who has studied at FTUI for at least two semesters, unless under specific circumstances. Academic leave for special circumstances is an academic leave that is given to a student for unavoidable reasons, such as: carrying out state task, undertaking university task, or undergoing medical treatment, which prohibit the said student from participating in academic activities. Academic leave is not counted as part of the length of study.

Procedures of Academic Leave

1. To apply for academic leave, a student must write a letter requesting for academic leave to the Head of Department. Head of Department will give recommendation to Vice Dean based on the student request before the beginning of the administrative registration period of the relevant semester.
2. If the academic leave is approved by the Vice Dean, PAF will change the status of the student to 'academic leave' before the beginning of the administrative registration period of the relevant semester, and the amount of tuition will be automatically changed.
3. The student must pay 25% of tuition during the period of administrative registration of the

intended semester.

4. If the student has been granted an academic leave but fails to pay the required tuition during the registration period, the academic leave will be canceled, and the student's status will change to 'inactive' (empty).
5. In the situation as stated above, if the student still insists on making payment after the registration period has passed, the student will be charged a late administrative registration fee in the amount stated in the Rector's Regulation on Academic Fees.
6. If the student fails to pay during the prescribed period of administrative registration, Exceptional Administrative Registration will apply.
7. If the academic leave is proposed not in accordance with point (1) above, or proposed after the semester starts, the student must pay the full amount (100%) of tuition.

Faculty and Department Judiciums

Judicium 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.

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 on student's request, while the diploma and academic transcripts are issued only once at the time of the student's graduation. Student Academic History and Academic Transcript contain the names, course codes and grades of all courses that the student have taken 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 highest education level), 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 in hard copy form on a student request as required. A valid DNS is signed by

the academic administration official in the Faculty level.

Academic Record chronologically lists all academic activities of a student since the FRS time registered as a student until no longer registered, either due to graduation, expulsion, or resignation. The academic status of a student for each semester is recorded in the Academic Record. The Academic Record is also used as a source of information for the student, Academic Advisor, and Study Program to help the student to achieve success in their study and is issued as required on the student's request and validated by the Vice Dean of the Faculty.

Academic Transcript is given to students that have been declared to fulfill all requirements to graduate from a Study Program in a faculty meeting and contains 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 languages, Bahasa Indonesia and English. The Academic Transcript will be given to students with no outstanding tuition fees.

Diploma is given to a student who has been verified in a faculty members meeting to complete all requirements to graduate from a Study Program. Diploma contains information on the personal identity of the diploma holder (name, place and date of birth), academic title, name and signature of the Rector and Dean, issuance date of diploma, 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 may request another 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 outstanding tuition fees.

Offenses and Sanctions

In any courses, no student shall engage in any form of unethical or improper conducts, including but not limited to examination offenses, such as:

1. Utilizing unauthorized materials/notes to enhance performance during on examination.
2. Attempting to observe the work of another student.

3. Taking an examination for another person, or permitting someone else to do so.
4. Collaborating improperly by joint effort on discussion in anyway expressly prohibited by lecturer.
5. 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 Panitia Penyelesaian Pelanggaran Tata Tertib (Offence Settlement Committee) (PT32) may be held.

Academic Sanction for Perpetrators of Academic Cheating In Exams

1. Academic sanction in the form of the revocation of the said exam (E grade) for the student caught or proven committing academic offence in the examination process, such as working with any other student, copying any other student's work or giving answer to any other student;
2. Academic sanction in the form of study period revocation (for all subjects) for the said semester for the student caught or proven committing academic offence in examination process such as opening books, notes or any other equipment prepared beforehand;
3. Academic sanction in the form of revocation of study period for the said semester and one semester suspension for the student caught or proven committing academic offence in the examination process due to collaborating with any third party outside of the examination room;
4. Academic sanction in the form of expulsion from the Faculty of Engineering, Universitas Indonesia, for the student caught or proven committing academic offence in the examination process by substituting any other examinee or by having someone else to take their place;
5. Academic sanction in the form of expulsion from the Faculty of Engineering, Universitas Indonesia, for the student caught or proven committing academic

offence in the examination process for planning and carrying out the plan to help any other examinee;

6. Other academic offence will be handled through a hearing by the Offence Settlement Committee (Panitia Penyelesaian Pelanggaran Tata Tertib (P3T2)), Faculty of Engineering, Universitas Indonesia;
7. Student is entitled to submit an appeal to the Faculty Academic Senate with the help of their Academic Advisor and the Vice Dean for Academic, Research, and Student Affairs, Faculty of Engineering, Universitas Indonesia..

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.

Academic Regulation Of The Universitas Indonesia

List of Academic Regulations at Universitas Indonesia can be accessed via <http://respository.ui.ac.id>. Below is a list of Decrees that functioned as reference for education program at Universitas Indonesia

General:

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

2. Decree of the Board of Trustees Universitas Indonesia Number: 006/MWA-UI/2004 on the Universitas Indonesia's Academic Curriculum
3. Decree of the Rector of Universitas Indonesia Number: 491/SK/R/UI/2004 on Universitas Indonesia Education Activities Conclusion Regulations
4. Decree of the Board of Trustees Universitas Indonesia Number: 001/TAP/MWA-UI/2005 on the Establishment of Academic Degrees in the Universitas Indonesia.
5. 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
6. Regulation of the Board of Trustees Universitas Indonesia Number: 006/Peraturan/MWA-UI/2005 on Student Learning Outcomes Evaluation at Universitas Indonesia
7. Regulation of the Board of Trustees Universitas Indonesia Number: 007/Peraturan/MWA-UI/2005 on Academic Education Implementation Norms in Universitas Indonesia
8. Regulation of the Board of Trustees Universitas Indonesia Number: 008/Peraturan/MWA-UI/2005 on Professional Education Curriculum Norms in Universitas Indonesia
9. Decree of the Rector of Universitas Indonesia Number: 838/SK/R/UI/2006 on Administration of Universitas Indonesia Student's Learning Outcomes
10. Decree of the Rector of Universitas Indonesia Number: 012/SK/R/UI/2007 on Implementation of the of Students Learning Activity in Universitas Indonesia
11. Decree of the Rector of Universitas Indonesia Number: 450/SK/R/UI/2008 on the Implementation of E-Learning in the University Indonesia
12. Decree of the Dean of Faculty of Engineering Universitas Indonesia Number: 3 year 2019 on the English Requirements for Undergraduate International Program Single Degree and Double Degree Faculty of Engineering Universitas Indonesia.
13. Decree of the Rector of Universitas Indonesia Number : 24 year 2022 on the Implementation of Undergraduate Program in Universitas Indonesia
14. Decree of the Rector of Universitas Indonesia Number : 25 year 2022 on the Implementation of Master Program in Universitas Indonesia
15. Decree of the Rector of Universitas Indonesia Number : 26 year 2022 on the Implementation of Doctoral Program in Universitas Indonesia
16. Decree of the Rector of Universitas Indonesia Number : 29 year 2022 on the Implementation of Professional Education Programs in Universitas Indonesia
17. 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.
18. 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.
19. 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.
20. Decree of the Dean of Faculty of Engineering Universitas Indonesia Number : 2 year 2022 on the Scientific Publication Assessment Guide for Master Program and Doctoral Program in Faculty of Engineering Universitas Indonesia.
21. Decree of the Dean of Faculty of Engineering Universitas Indonesia Number : 703 year 2016 ont the Credit Transfer

Research

1. Decree of the Board of Trustees Universitas Indonesia Number 002/SK/MWA-UI/2008 on University's Research Norms
2. Decree of the Board of Trustees Universitas Indonesia Number 003/SK/MWA-UI/2008 on Research Policy at Universitas Indonesia
3. 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

CHAPTER 3

PROFESSIONAL PROGRAM



Professional Program for Engineers

Program Specification

1.	Awarding Institution	Universitas Indonesia	
2.	Teaching Institution	Universitas Indonesia	
3.	Faculty	Engineering	
4.	Program	Professional Education Program for Engineers	
5.	Vision and Mission	Vision : To Produce Professional engineers who are dignified, have a high entrepreneurial spirit, and competencies that are following the requirements set both at national and international level. Mission : a. Carrying out Professional Education Programs following engineering principles, ethics, and professional standards; b. Encourage competence, technical skills, and professional responsibilities starting from the stage Design up to implementation in various engineering profession activities; c. Equipping managerial skills and a dignified entrepreneurial spirit.	
6.	Class type	Regular, RPL	
7.	Final Award	Insinyur (Ir)	
8.	Accreditation Status	Accredited BAN-PT: B	
9.	Language of Instruction	Indonesia	
10.	Study Scheme (Full Time / Part-Time)	Full Time	
11.	Entry Requirements	Pass the entrance exam (SIMAK-UI), and Graduate (S1) from the field of Engineering and its equivalent RPL: additional requirements in the form of work experience of more than 5 years and have a portfolio of engineering practice	
12.	Study Duration	Regular: Scheduled for 1 year RPL: Scheduled for 1 semester	
	Semester Type	Number of semester	Number of weeks/semesters
	Special	2	16
13.	Aims of the programme:	To produce engineers who can master the code of ethics and the behavior of engineers; mastering engineering technical skills including developing designs and completing various technical and tender documents; and mastering the code of compliance, whether it concerns services to clients, compliance with regulations, and engineering issues such as safety, environment and sustainability	
14.	Profile of Graduates:	Professional graduates who are able to solve problems in the engineering field based on technology in accordance with professional ethics	



15.	Expected Learning Outcomes (ELO - KKN Level 7) :		
	a. Able to manage engineering resources under its responsibility comprehensively by utilizing science and technology to produce technical steps in the strategic development of the organization in its field of work.		
	b. Able to research to make strategic decisions with full accountability and responsibility for all aspects under the responsibility of their area of expertise.		
	c. Able to solve problems with science and technology.		
	d. Generate added value and benefits for the community in the field of engineering through monodisciplinary and multidisciplinary approaches.		
16.	Classification of Subjects		
No.	Types of Subjects	Credits	Percentage
I	Code of Ethics and Ethics of Engineers	2	8.3%
II	Professionalism	2	8.3%
III	Health, Safety and the Environment	2	8.3%
IV	Engineering Practices	12	50%
V	Case Studies	4	16.6%
VI	Seminar, Workshop and other Dissemination	2	8.3%
	Total	24	100%

Career Prospects and Job Opportunities

Graduates from this study program can work in various industrial sectors and fields, including energy and power generation, information technology, construction, chemical, electronics, oil & gas, telecommunications, education and other related industries. Graduates who have worked previously have the opportunity to advance to a higher career path. Participants who have been declared to have passed the Professional Engineer Study Program obtain an Engineer Degree from a Higher Education and are entitled to use the professional engineer title which is abbreviated as "Ir" and can then take the Professional Engineer Competency Test conducted by professional associations. Certificate of Competence as a professional engineer and Engineer Registration Certificate (STRI).

Process of Equalizing Recognition of Prior Learning (RPL) Portfolio with Regular Program Courses

The process of equalization so that the equivalent of the RPL track with the regular track can be seen in Figure 1 with

activities that can be evaluated based on a portfolio consisting of:

- Engineering Ethics
- K3L
- Engineering Professionalism
- Case study
- Seminar

The engineering practice activities are carried out in their respective workplaces with field supervisors. While the process of supervising the preparation of the final project report is carried out in campus (can be online or offline).

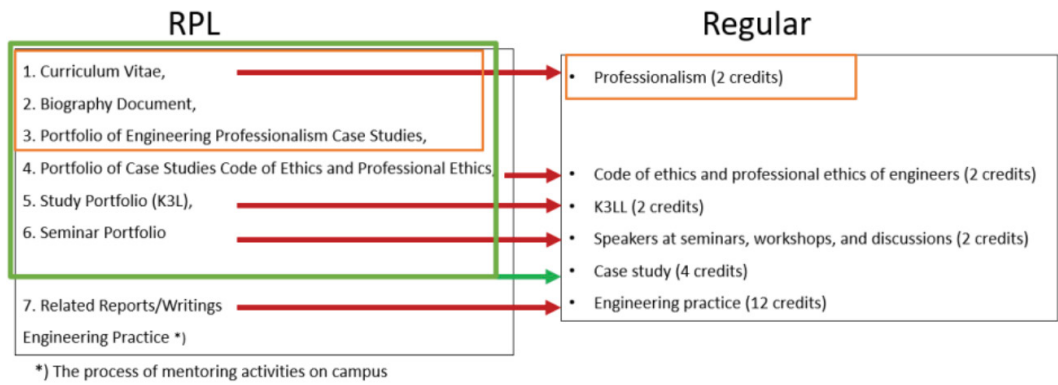
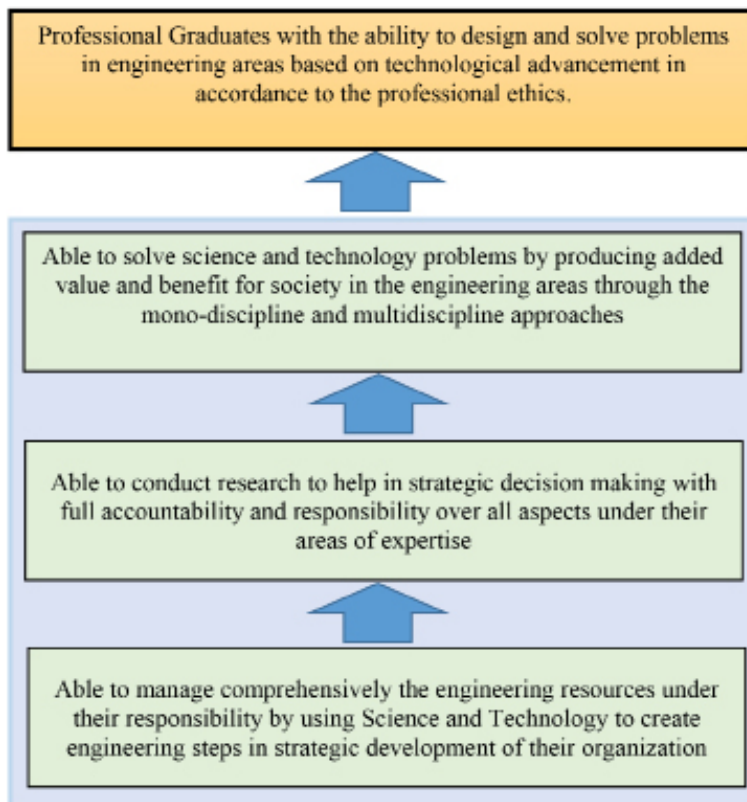


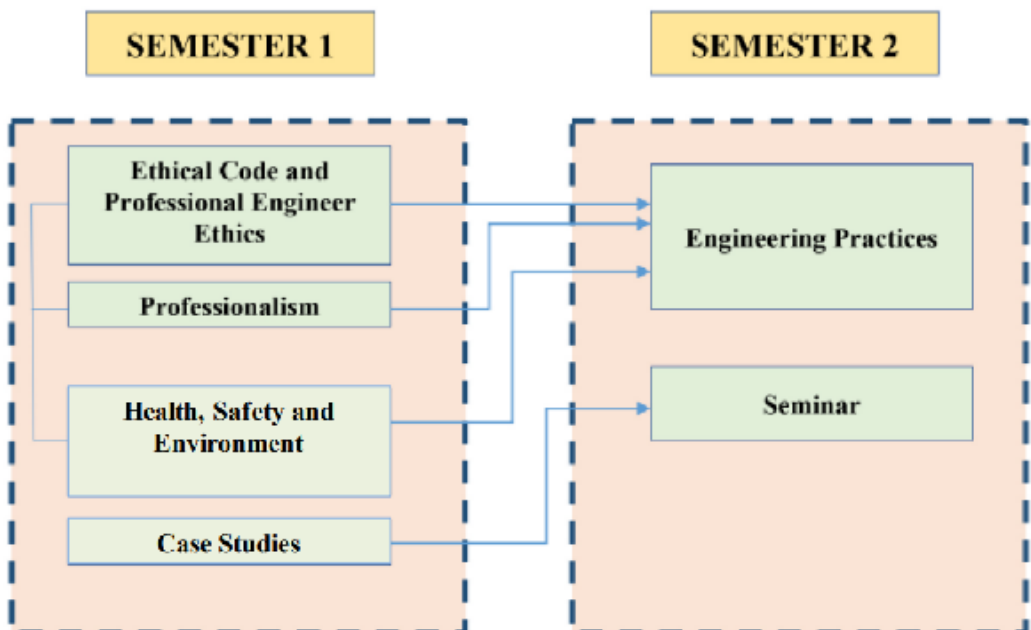
Figure 1. Equalization Scheme of RPL track with Regular track Learning Outcomes (ELO)

Expected Learning Outcomes (ELO)

Competency Framework Professional Engineer Study Program



Curriculum Flow Diagram Professional Program for Engineers





Course Structure Professional Program for Engineers

Code	Subject	SKS
1st Semester		
ENIR701001	Code of Ethics and Ethics of Engineers	2
ENIR701002	Professionalism	2
ENIR701003	Health, Safety and Environment	2
ENIR701004	Case Study	4
	Sub Total	10
2nd Semester		
ENIR702005	Engineering Practices	12
ENIR702006	Seminar	2
	Sub Total	14
	Total	24

Syllabus Professional Education Program for Engineers

Code of Ethics and Ethics of Engineers

ENIR701001

2 CREDITS

Course Learning Outcomes :

1. Understanding the meaning of professional, professionalism, ethical code, and code of rules for engineering behavior.
2. Understanding competency and engineering body of knowledge.
3. Recognizing engineer ethics responsibility, sensitivity, and care on duty, function, responsibility, and accountability.
4. Understanding the Indonesia Engineer Ethics Code
5. Able to discuss the dilemma faced during decision making process in regards to Engineering Ethics Code
6. Able to increase conscience sensibility in handling ethical issues in engineering
7. Able to prepare decision making draft in addressing engineering ethics cases (formulize, prepare supporting data, prepare the choice of a solutions and recommendations).

Syllabus :

Preliminary; Understanding of Ethics and Engineering; Catur Karsa - Sapta Dharma; Various Professional Ethics and Ethics; Professional Certification Standards; Regulations and Regulations in the field of Engineering; Case studies related to ethical code practices; Discussion and Presentation

Prerequisite :-

Textbooks :

1. Charles E. Harris "Engineering Ethics Concepts and Cases", Fourth Edition, Wadsworth, Cengage Learning, 2009.
2. Charles B. Fleddermann, "Engineering Ethics", University of New Mexico, Prentice Hall, 2012.
3. R.S. Naagarazan, Professional Ethics and Human Values, New Age International (P) Limited, Publisher, 2006

Professionalism

ENIR701002

2 CREDITS

Course Learning Outcomes :

1. Understand how to implement planning and design to give added value.
2. Understand in respect of health, safety, and environmental preservation.
3. Understand the influence of technical and non-technical factors and the implementation of professional ethics in the implementation of work.
4. Understand the Engineering Standard.
5. Understand how to conduct data analysis and evaluation.
6. Able to recognize the ability, weakness and strength of work space.
7. Able to work together in a team in a limited period of time.
8. Able to perform feasibility and appropriateness selection for decision making process.
9. Able to communicate and coordinate.

Syllabus :

1. Definition of professionalism
2. The characteristics of professionalism and professional code of ethics
3. Professionals in various fields of engineering as well as certificates of expertise.
4. Several regional and global professional organizations and professional engineer

standards in various engineering fields

5. Some management standards: Quality Management Standards (ISO 9000); Production Management System (TQM, SixSigma); Occupational Safety and Health Management Standards, OSHAS 18000; Environmental Management Standard (ISO14000)
6. Various regulations related to the profession and engineering work, including regarding copyright, the scope of copyright, copyright protection, IPR
7. Case studies and the ability to identify technical problems, find out methods of solving problems, make work plans including providing professional solutions related to professional ethical dilemmas

Prerequisite : -

Textbooks :

1. Bennett, F. Lawrence. The Management of Engineering: Human, Quality, Organizational, Legal, and Ethical Aspects of Professional Practice. New York: John Wiley & Sons, Inc., 1996
2. Harris JR., Charles E., et.al. Engineering Ethics : Concepts and Cases. Belmont : Wadsworth
3. Fleddermann, Charles B. Engineering Ethics. Upper Saddle River, NJ. : Prentice Hall - Engineering Source, 1999
4. Accreditation Board for Engineering and Technology. 2000. Annual Report. New York, 2000
5. Etika Enjiniring Ed. 2 Penerbit Erlangga

Safety, Health, and Environment

ENIR701003

2 CREDITS

Course Learning Outcomes :

1. Able to identify the purpose of each safety, health, work safety and environment policy, procedures, and benefit in their line of work.
2. Able to demonstrate their understanding on the background of investigation concept and report system by using the ICS (Incident Command System) method.
3. Able to do evaluation based on behavior industry in implementing predetermined investigative procedures.
4. Able to provide insight on "Emergency Preparedness Process & System Concept", thus enabling them to prepare Emergency

Preparedness System in their work.

5. Able to understand the stages needed to be taken in implementing the Health, Safety and Environmental and Work Safety and what should be done in each stages.
6. Have an awareness in the form of responsible behavior in carrying out health, safety and work

Syllabus :

K3L Management Systems; New Paradigm SHE Management; Risk Management; Fire Management; Lost Control Management; Behavior Management; Safety Audit dan Inspection; Incidents Investigation; Emergency Response Management; Chemical Hazards; Ergonomic and Work Physiology; Physical Dangers in Industry; Safety Engineering; Industrial Psychology; Industrial Toxicology; Industrial Ventilation; Industrial Hygiene Basic.

Prerequisite : -

Textbooks :

1. International Safety Rating System (ISRS7) Omega Workbook Best Practice Process Assessment.
2. Manajemen Pengendalian Kerugian edisi ketiga, Frank E. Bird. Jr, George L. Germain, & M Douglas Clark
3. Risk Reduction and Emergency Preparedness, WHO six year strategy for the health sector and community development

Case Studies

ENIR701004

4 CREDITS

Course Learning Outcomes :

1. Encouraged to have analytical abilities towards practical engineering issues arising.
2. Able to independently develop ideas and solutions and implement their theoretical knowledge in solving problems.
3. Able to prepare themselves in handling crisis situation in various professional engineering/ industry environment (in accordance to UU-11).
4. Able to comprehend multidiscipline communication and have an appreciation to other discipline.
5. Understand the core problem and essence and how to address engineering problems.

Syllabus :

Preliminary; Introduction and definition of case studies; Method of selecting and determining

case studies; Systematic preparation of case study reports; Case study 1 presentation (code of ethics & professional ethics of engineers); Case study 2 presentation (engineering professionalism); Exposure to case study 3 (K3L in the field of engineering); Final discussion of case study results.

Prerequisite : -

Textbooks :

1. Donohue, E. Willian, Krasner, Leonard. (1995), Handbook of Psychological Skills Training. Boston: Allyn and Bacon.
2. Santrock, J. Jhon. 1993. Adolescence : An Introduction. Wisconsin:
3. Undang-undang Republik Indonesia Nomor 11 Tahun 2014 Tentang Keinsinyuran

Engineering Practices

ENIR702005

12 CREDITS

Course Learning Outcomes :

1. Understand the engineering philosophy through experience by conducting on the job training.
2. Understand the trend on engineering science through their experience in their on the job training.
3. Have an understanding on industry system or engineering system through the use of said systems in their industry or company where the students conduct their on the job training.
4. Able to solve problems in their on the job training.
5. Able to write complete report on how appropriate engineering report in accordance with the desired term of reference by the end user of the engineering service.
6. Able to present and communicate their engineering results as part of their on the job training outputs.

Syllabus :

Work as an “engineer” under the supervision of professional engineers in the company/industry and try to record various matters related to the philosophy of engineering, the direction and development of engineering, and the industrial system referred to by the company; Also playing a role in solving problems in the company under the supervision of professional engineers in the company where the practice works; Conduct presentation and communication from the results of practical work reports.

Prerequisite : -

Textbooks :

1. Fleddermann, c., B., 2006. Etika Enjiniring. Edisi kedua, Percetakan PT Gelora Aksara Pratama, judul asli ‘Engineering Ethics’ second ed. Penerjemah Bob Sabran dan Shirley Affandy, Penerbit Erlangga.
2. Post, J.E., Frederick, W.C., Lawrence, A.T., and Weber, J., 1996. Business and Society - Corporate Strategy, Public Policy, Ethics. Eight edition, McGraw- Hill Inc.
3. Barrie, D.S., Paulson, B. C., Sudinarto, 1993. Manajemen Konstruksi Professional, Penerbit Erlangga Jakarta.
4. Keraf, S., 1996. Pasar Bebas Keadilan dan Peran Pemerintah Telaah Atas Etika Politik Ekonomi Adam Smith. Penerbit Kanisius Yogyakarta.
5. Persatuan Insinyur Indonesia, 2004. Bakuan Kompetensi Insinyur Professional PII, Jakarta.
6. Suyitno, B.M., 2004. Etika Profesi, PII Cabang Surakarta.
7. Wigjosubroto, S., 1999. Etika Professional Pengalaman dan Permasalahan. Badan Kejuruan Mesin PII Jakarta.

Seminar

ENIR702006

2 CREDITS

Course Learning Outcomes :

1. Understand the Term of Reference (TOR) as speaker in seminar, workshop, or discussion.
2. Understand the requested general theme and the subtheme.
3. Able to compile materials.
4. Able to convey said materials consecutively and structurally within the allocated time frame.
5. Able to understand and answer questions.
6. Able to have a discussion and communicate

Syllabus :

Conduct public dissemination activities related to engineering aspects. Activities can take the form of presentations as resource persons at seminar forums, symposia, panel discussions, workshops, conferences or public lectures.

Prerequisite : -

Textbooks :

CHAPTER 4

MASTER PROGRAM



Master Program

Energy Systems Engineering

Program Specification

1.	Awarding Institution	Universitas Indonesia	
2.	Teaching Institution	Universitas Indonesia	
3.	Faculty	Engineering	
4.	Program Title	Master Program in Energy Systems Engineering	
5.	Vision and Mission	Vision : Becoming an excellent Master's Program in Energy Systems Engineering at an international level. Mission : To provide students with interdisciplinary knowledge in energy systems engineering that covers technical, economic, environmental, and policy aspects.	
6.	Class type	Special Class	
7.	Final Award	MT	
8.	Accreditation Status	BAN-PT (accredited Very Good or "Baik Sekali")	
9.	Language of Instruction	Indonesia	
10.	Study Scheme (Full Time / Part-Time)	Full Time	
11.	Entry Requirements	Pass the entrance selection test (SIMAK-UI), and Bachelor (S1) graduates from the field of Engineering, Natural Sciences, and Economy (including Business and Management)	
12.	Study Duration	Scheduled for two years	
	Semester Type	Number of semester	Number of weeks/semesters
	Reguler	4	16
13.	Aims of the programme: The Master's Program in Energy Systems Engineering aims to produce graduates capable of designing, analyzing, and applying energy systems to solve problems in the energy sector by utilizing an interdisciplinary approach.		
14.	Profile of Graduates: A Master in Energy Systems Engineering can design energy systems and formulate energy policy to support sustainable development at national and international levels.		

15.	Expected Learning Outcomes (ELO) : Master's Program in Energy Systems Engineering has the following Expected Learning Outcomes: 1. Students can design sustainable energy systems based on renewable, low carbon and carbon neutral energy. 2. Students can evaluate energy economics and business models. 3. Students can develop energy planning and policy. 4. Students can comprehensively analyze interdisciplinarity of energy transition systems to achieve net zero emissions.		
16.	Classification of Subjects		
No.	Types of Subjects	Credits	Percentage
I	Compulsory courses at the study program level	26	62%
II	Elective courses	16	38%
	Total	42	100%
	Total Credits for Graduation		42

Job Prospects

Graduates of this study program can work on:

1. Business Institutions / Professionals.
2. Government Institutions, such as Kementerian Energi dan Sumber Daya Mineral (ESDM), Kementerian Badan Usaha Milik Negara (BUMN) and Kementerian Keuangan.
3. State-Owned Enterprises, such as Pertamina, PLN, and PGN.
4. Educational and research institutions.



Expected Learning Outcomes (ELO)

GRADUATE PROFILE:

A Master in Energy Systems Engineering can design energy systems and analyze energy policy to support sustainable development at national and international levels.

1. Students can design sustainable energy systems based on renewable, low carbon and carbon neutral energy.

3. Students can develop energy planning and policy.

2. Students can evaluate energy economics and business models.

4. Students can comprehensively analyze interdisciplinarity of energy transition systems to achieve net zero emissions.

Flowchart of courses to attain the expected learning outcomes in the Master's Program in Energy Systems Engineering

Expected Learning Outcomes	Courses			
	Semester 1	Semester 2	Semester 3	Semester 4
Students can design sustainable energy systems based on renewable, low carbon and carbon neutral energy.	Sustainable Energy Systems Energy Technology	Materials for Energy Smart Grid and Distributed Power Generation Renewable Energy	Energy Storage System Carbon Capture Utilization and Sequestration	
Students can evaluate energy planning, policies, economics and business models.	Advanced Engineering Mathematics	Energy Systems Modelling and Policy Analysis	Energy Regulations and Markets Energy Transition Economics Energy Planning and Policy	
Students can comprehensively analyze interdisciplinarity of energy transition systems to achieve net zero emissions.		Pre-Thesis		Thesis Scientific Publication

Core courses

Elective courses

Course Structure Master Program in Energy Systems Engineering

Core Courses

Code	Subject	SKS
1st Semester		
ENES801001	Advanced Engineering Mathematics	4
ENES801002	Sustainable Energy Systems	4
ENES801003	Energy Technology	4
	Sub Total	12
2nd Semester		
ENES802004	Pre-Thesis	2
	Elective 1	4
	Elective 2	4
	Sub Total	10
3rd Semester		
ENES803005	Energy Planning and Policy	4
	Elective 3	4
	Elective 4	4
	Sub Total	12
4th Semester		
ENES804006	Master Thesis	6
ENES804007	Scientific Publications	2
	Sub Total	8
	Total	42

Elective Courses

Code	Subject	SKS
ENES802008	Energy Systems Modelling and Policy Analysis	4
ENES803017	Energy Transition Economics	4
ENES802012	Materials for Energy	4
ENES803020	Energy Storage System	4
ENES802013	Smart Grid and Distributed Power Generation	4
ENES802014	Renewable Energy	4
ENES803015	Energy Regulations and Markets	4
	Carbon Capture Utilization and Sequestration	4

Students may take elective courses across departments within or outside the Faculty of Engineering. Taking these cross courses must be by following the Faculty of Engineering, Universitas Indonesia rules.

Syllabus Master Program in Energy Systems Engineering

Advanced Mathematics

ENES801001

4 CREDITS

Expected Learning Outcomes:

Students can design technology and system on renewable and carbon-neutral energy.

Course Learning Outcomes :

This course aims to provide students with mathematical-based analysis and modeling skills so that students are expected to be able to use various analytical tools (modeling) to perform calculations, analyses, and simulations related to energy.

Syllabus :

The Advanced Engineering Mathematics course provides analytical or modeling tools to support policymaking, generally based on mathematical equations and can be used to perform data analysis or simulations that are typically related to energy. The scope of the material taught includes Probability, Dynamic and Optimization Model.

Prerequisite : -

Textbooks :

1. Meerschaert, Mark M. Mathematical Modeling Fourth Edition. Elsevier. Michigan; 2013.

Sustainable Energy System

ENES801002

4 CREDITS

Expected Learning Outcomes:

Students can analyze energy economics and business model.

Course Learning Outcomes :

This course provides an overview of current energy status and the transition to future energy systems, especially energy resources (fossil and renewables), conversion, transportation, storage and end-used technologies as well as its linkage to other systems (economic, social and environment).

Syllabus :

This course includes Concept of energy system, sustainability and sustainable energy; Global climate change, mitigation and cleaner fossil energy systems; Energy System Transition; Bioenergy; Hydropower system; Geothermal Energy; Variable Renewable Energy (VRE) wind and solar energy; Hydrogen Fuel and fuel cell nuclear energy; Energy storages and

power flexibility; Energy demand systems, energy efficiency and conservation; Sustainable energy policy and Energy Economic.

Prerequisite :

Textbooks :

1. Jefferson W. Tester, et al., Sustainable Energy: Choosing Among Options, MIT Press, 2005.
2. Godfrey Boyle, et al. Energy Systems and Sustainability: Power for a Sustainable Future, Oxford University Press, 2003.
3. Mac Kay, D.J.C., Sustainable Energy –without hot air, UIT Cambridge, 2008, free online
4. Dincer, Ibrahim, Zamfirescu, Calin, Sustainable Energy Systems and Applications, Springer, 2012.
5. Hendrik Lund, Renewable Energy Systems. A Smart Energy Systems Approach to the Choice and Modeling of 100% Renewable Solutions, 2nd Edition, Elsevier, 2014.

Energy Technology

ENES801003

4 CREDITS

Expected Learning Outcomes:

Students can analyze the design and optimization of energy technologies based on renewable energies.

Course Learning Outcomes :

The learning outcome of this subject is that students can explain the resources, processes, applications, and technologies related to energy conversion.

Syllabus :

The scope or syllabus taught in this course includes Power Generation; Engine Heat and Heat Exchangers; Fossil Energy; Geothermal Energy; Solar energy; Wind energy; hydro energy, nuclear energy, and Biomass energy.

Prerequisite : -

Textbooks :

1. Fanchi JR. Energy Technology and Directions for the Future. Academic Press; 2004.
2. Sulaiman SA (editor). Clean Energy Opportunities in Tropical Countries [Internet]. 1st ed. 2021. 2021.

Pre-Thesis

ENES802004

2 CREDITS

Expected Learning Outcomes:

Students can develop interdisciplinary research in energy systems engineering.

Course Learning Outcomes :

The learning outcome of this subject is that students can study a topic scientifically and write a research proposal.

Syllabus :

This course includes an introduction, techniques to identify problems and arrange hypotheses, logical thinking, scientific writing methods, technical writing of research proposals, designing research techniques, presentation techniques, and techniques to collect, analyze, and present data.

Prerequisite : -

Textbooks :

1. Pedoman Teknis Penulisan Tugas Akhir Mahasiswa Universitas Indonesia, Keputusan Rektor Universitas Indonesia Nomor 2143/SK/R/UI/2017.

Energy Planning and Policy

ENES803005

4 CREDITS

Expected Learning Outcomes:

Students can formulate energy policy and planning.

Course Learning Outcomes :

This course provides the concept of Energy Planning and Policy in solving energy system problems based on technical, economic, environmental and political aspects.

Syllabus :

This course covers the following topics: Introduction, Statistical Review on Energy Modelling, Model Use in Decision Making, Method for Model Evaluation, Communication Problem in Energy Policy Analysis, Modelling Energy Demand in Short and Middle Term, Energy Model and Technology Review, Electricity Development in the Future, Production Modelling, Price Production Decision, Analysis and Energy Demand Modelling, Using Energy Modelling for Business Decision, Model Comparison for Policy and Energy Planning, Validation Problem and Energy Model Assessment.

Prerequisite : -

Textbooks :

1. Energy Policy Planning · Editors: B. A. Bayraktar, E. A. Cherniavsky, M. A. · Series Title: Nato Conference Series · Springer New York, NY

2. Purwanto W, Nugroho Y, Dalimi R, Soepardjo AH, Wahid A, Supramono D, et al. Indonesia Energy Outlook and Statistics 2006. 2006.

Master Thesis

ENES804006

6 CREDITS

Expected Learning Outcomes:

Students can develop interdisciplinary research in energy systems engineering.

Course Learning Outcomes :

Students can design and conduct research in energy systems engineering and present research results in oral and writing.

Syllabus :

Material based on the research topic

Prerequisite : -

Based on regulation

Textbooks :

1. Pedoman Teknis Penulisan Tugas Akhir Mahasiswa Universitas Indonesia, Keputusan Rektor Universitas Indonesia Nomor 2143/SK/R/UI/2017.

Scientific Publication

ENES804007

2 CREDITS

Expected Learning Outcomes:

Students can develop interdisciplinary research in energy systems engineering.

Course Learning Outcomes :

Students will be able to produce scientific writing on the results of studies or the research with a decent quality to be published in national or international dissemination forums.

Syllabus :

The rules of scientific writing; various modes of scientific writing; the argument formulation strategy in a scientific paper that clearly shows the position on existing knowledge; publication procedures in national/ international seminars/conferences; publication procedures in internationally reputable journals; article review in internationally reputable journals.

Prerequisite : Master Thesis

Textbooks : Relevant references to the research topic of the Master Thesis

Elective Courses

Energy Modelling and Policy Analysis

ENES802008

4 CREDITS

Expected Learning Outcomes:

Students can formulate energy policy and planning.

Course Learning Outcomes :

The learning outcome of this subject is to provide a skill energy system modeling using well known models/software to support sustainable energy system design, energy planning and policy as well as decision-making.

Syllabus :

This course includes a study on Energy System Modelling and Reference Energy System; Energy Demand Model; Energy Supply and Technology Model; Type of Energy Model and Software Tools; Integrated Supply-Demand model & Optimization; Economic and Environmental Model; System Dynamics Modelling; Decision Making Process and Model Based Policy Making; Scenario Planning Development.

Prerequisite :-

Textbooks :

1. A. Integration of Large-Scale Renewable Energy into Bulk Power Systems: From Planning to Operation, Du, P., Baldick, R., & Tuohy, Springer International Publishing, 2017.
2. Energy System Analysis for Developing Countries, Meier, P., Springer-Verlag, 1984.
3. Energy Policy Analysis and Modeling, Munasinghe, M., & Meier, P, Cambridge University Press, 1993.
4. Optimization of Energy Supply Systems: Modelling, Programming and Analysis, Nagel, J., Springer International Publishing, 2018.

Renewable Energy

ENES802014

4 CREDITS

Expected Learning Outcomes:

Students can analyze the design and optimization of energy technologies based on renewable energies.

Course Learning Outcomes :

This course provides knowledge to design of various renewable energy sources, the technology of renewable energy conversion, and the use of renewable energy in Indonesia and the world, and

the economics of renewable energy.

Syllabus :

Various renewable energy and the infrastructure relevant to each renewable energy. This course also discusses design renewable energy systems and its application in Indonesia and the world, and evaluate the economics of renewable energy.

Prerequisite :-

Textbooks :

1. Tester, Jefferson W., et al. Sustainable Energy. Choosing Among Options, The MIT Press, 2012.
2. Charles F. Kutscher, Jana B. Milford, Frank Kreith. Principles of Sustainable Energy Systems, CRC Press, Taylor & Francis Group, 2019.

Materials for Energy

ENES802012

4 CREDITS

Expected Learning Outcomes:

Students can analyze the design and optimization of energy technologies based on renewable energies.

Course Learning Outcomes:

This course includes overview of the latest developments in materials chemistry, various synthesis approaches, and properties of energy materials for energy storage and energy conversion for efficient and sustainable energy applications.

Syllabus:

This course includes the following topics: Fundamental and latest advances in energy materials, the electrical characteristic of a material, material for electrochemical energy, material for solar energy, material for wind energy, materials for energy storage, advanced material for energy harvesting, and future perspective.

Prerequisite: -

Textbooks :

1. Zhang, S. Materials for Energy 1st edition, CRC Press, Taylor & Francis Group, 2021.
2. Dhoble, S.J., et al. Energy Materials Fundamentals to Application 1st edition. Elsevier. 2021.
3. Gupta, R. Handbook of Energy Materials. Springer Singapore. 2022.

Smart Grid and Distributed Power Generation

ENES802013

4 CREDITS

Expected Learning Outcomes:

Students can analyze the design and optimization of energy technologies based on renewable energies.

Course Learning Outcomes:

This course provides a complete evaluation of programming and protection of smart grid and distributed power generation, the concept of distribution, stability, and quality of generating networks.

Syllabus:

This course covers these topics: Introduction, What, Why, How, If and When is Smart Grid, Smart Grid more than Technology, From Smart Grid to Smart Energy Uses, Equity Implications of Smart Grid, Renewable Energy Prospects, Vision dan Mission of Smart Grid, Manifestation Potential Renewable and Distributed Power Plants, Rules of Microgrids, Renewable Energy Integration, Software Infrastructure and Smart Grid, Smart Pricing, Success in the Smart Grid, Effects of Smart EVs.

Prerequisite: -

Textbooks :

1. Sioshansi F. (editor) Smart Grid Integrating Renewable, Distributed and Efficient Energy. Academic Press; 2011.

Energy Regulations and Markets

ENES803015

4 CREDITS

Expected Learning Outcomes:

Students can formulate energy policy and planning.

Course Learning Outcomes:

The learning outcome of this subject are: the electric power system from an interdisciplinary point of view, which deals with policy, regulation, markets, and the economy..

Syllabus:

This course includes the following topics: Introduction, Understanding of the Electric Industry, Energy Competition, Regulation Levels for Transmission and Distribution, Competition Support, Load Balancing and Power Delivery, Ensuring Reliability in Superior Markets, Role of Countries in Electricity Regulation and Markets, Standard Cost Coverage, Rebuilding and Environmental Safety, Programs for Public Communities in Competitive Markets, Prospects of Restructuring.

Prerequisite: -

Textbooks :

1. Brennan TJ, Palmer KL, Martinez SA. Alternating Currents Electricity Markets and Public Policy. Routledge; 2002.

Energy Transition Economics

ENES803017

4 CREDITS

Expected Learning Outcomes:

Students can analyze energy economics and business model.

Course Learning Outcomes:

The learning outcomes of this subject are: theory of energy economics; market and pricing of energy; emerging issues raised by the transition to a low carbon economy; the basics of the energy transition and the technologies and innovations need to achieve it; the economics of renewable energy sources and compare alternative energy systems that require vastly different capital expenditures and operating costs and how governments support them; energy transition impact on jobs inequality finance trade mobility and infrastructure or citizens societies and nations; decarbonisation and carbon pricing policies and how the country will become climate-neutral; the role of public policy instruments including taxes, regulations, and incentives in accelerating the transition away from traditional fossil fuels.

Syllabus:

This course includes the following topics: The theory of energy economics; Transition, Regulation and Energy Market; Energy Pricing; Economic principles of the Energy transition; Impact energy transition on energy markets and societies; Financing energy transition; Carbon markets.

Prerequisite: -

Textbooks :

1. Alessandro Rubino, Alessandro Sapio, Massimo La Scala. Handbook of Energy Economics and Policy. Fundamentals and Applications for Engineers and Energy Planners, Elsevier, 2021
2. Subhes C. Bhattacharyya, Energy Economics. Concepts, Issues, Markets and Governance, Springer, 2011
3. Zweifel, Peter, Praktikno, Aaron, Erdmann, Georg, Energy Economics. Theory and Applications, Springer, 2017
4. Joanne Evans, Lester C. Hunt. International Handbook on the Economics of Energy, Edward Elgar Publishing Limited, 2009

5. Petit, Vincent. The Energy Transition. An Overview of the True Challenge of the 21st Century., Springer 2017

Energy Storage System

ENES803020

4 CREDITS

Expected Learning Outcomes:

Students can analyze the design and optimization of energy technologies based on renewable energies.

Course Learning Outcomes:

The learning outcomes of this subject are: Principles of Energy Storage System (ESS) and Energy storage application on different renewable energy system.

Syllabus:

This course includes the following topics: Introduction of energy storage system, Battery ESS, Hydrogen based ESS, Capacitor and Super Capacitor, Flywheel ESS, Pumped hydro ESS, Compressed Air ESS, Thermal ESS, Electromagnetic ESS, and micro scale ESS.

Prerequisite: -

Textbooks :

1. Bresser D, Passerini S. Handbook of Battery Materials. Second Edition; Edited by Claus Daniel and Jürgen O. Besenhard. Energy Technology. 2013 Oct 1;1(10):617–8.
2. Kiehne HA. Battery Technology Handbook. CRC Press; 2003.
3. Gulbinska MK. Lithium-ion Battery Materials and Engineering: Current Topics and Problems from the Manufacturing Perspective. Springer-Verlag London; 2014.
4. Warner J. The Handbook of Lithium-Ion Battery Pack Design. Elsevier Science; 2015.

Carbon Capture Utilisation and Sequestration

4 CREDITS

Expected Learning Outcomes:

Students can develop interdisciplinary research in energy systems engineering.

Course Learning Outcomes:

The purpose of this course is to provide an overview of Carbon Capture and Sequestration (CCS), with a focus on the latest technology for reducing CO₂ emissions from the atmosphere, the different methods of capturing and storing carbon dioxide with advanced capture and sequestration technologies also Carbon Capture Utilisation (CCU) for fuels, chemicals, or other commodities.

Syllabus:

This course includes the following topics: Introduction to Carbon Capture Utilisation and Sequestration (CCUS); Precombustion, oxyfuel and post combustion CO₂ Capture technology; CO₂ sequestration in subsurface and its application; Carbon Capture and Utilisation (CCU) to fuel and chemical; Negative Emission Technology (NET); Political economy of carbon capture utilisation and sequestration.

Prerequisite: -

Textbooks :

1. Bui, Mai., Dowell, N.M., Carbon Capture and Storage, Royal Society of Chemistry, Cambridge, 2019.
2. Ballerat-Busserolles, K., et al. Cutting-Edge Technology for Carbon Capture, Utilization, and Storage, Wiley, Beverly, 2018.



Study Program Magister of Urban and Regional Planning

Program Specification

1.	Degree Awarding Institution	Universitas Indonesia	
2.	University/Institution	Universitas Indonesia	
3.	Faculty	Engineering	
4.	Major Name	Study Program Magister of Urban and Regional Planning	
5.	Mission and Vision	Vision: "to become the center for development of multidisciplinary science with a focus on the application of smart cities and urban economic development based on the noble values of Indonesia, in the field of urban and Regional Planning at the National and International Levels." Mission: 1. Prepare graduates who are capable of lifelong learning, able to adapt to the field of work, have a good morals and leadership qualities, able to compete on the international market. 2. Produce useful work in the field of Urban and Regional Planning through structured academic and research programs at the post-graduate level (master). 3. Prepare planners who have competence in accordance with their specific and prospective fields in an interdisciplinary perspective.	
6.	Type of Class	Regular, Research	
7.	Awarding Degree	Magister Perencanaan Wilayah dan Kota (M.PWK.)	
8.	Educational Accreditation	BAN-PT: Very Good	
9.	Language	Bahasa Indonesia	
10.	Learning Scheme (full/part time)	Full Time	
11.	Requirements	Bachelor degree/equal	
12.	Study Period	Scheduled for 2 years	
	Type Semester	Total Semester	Weeks per Semester
	Reguler	4	17
	In between (optional)		
13.	Aims of the programme:	1. Creating urban planners that are able to support city residents to have a sustainable life (by optimizing existing resources), both in terms of social. Economic. health, cultural. Political. Ecological and security aspects. 2. Emphasize aspects of the application of information technology. Community participation and appropriate theory and practice in the planning process. 3. Increase understanding of human settlements and urban planning issues so they can provide for and anticipate the needs of their citizens.	
14.	Profile of Graduates:	Masters in Urban and Regional Planning who are able to produce substantives. Technical and administrative qualified urban panners. Bu considering the impacts of interventions on a city scape in social, economic, cultural, political, and security aspects from time to time.	

15.	Learning Outcomes (CPL): Master in Urban and Regional Planning has the following learning outcomes: 1. Able to analyze the growth and development of the city with appropriate approaches and appropriate technologies; 2. Able to predict the needs of an increasing complex city; 3. Able to test plans and policies using various urban method and technologies in an effort to improve and maintain the quality of life of the population; 4. Able to evaluate plans activities that can improve services to underprivileged residents; 5. Able to propose research designs and conduct applied research in the field of urban planning; 6. Able to conclude urban planning solutions and their documents in solving urban problems.		
16.	Course Composition		
No.	Type of Course	Credits	Percentage
I	University Course		
II	Faculty Course		
III	Required Structural Course	20	47,8%
IV	Elective Course	12	28,5%
V	Special Course: Thesis	8	19,0%
VI	Publication	2	4,7%
	Total	42	100%

Job Prospects

Graduates of this study program can work in:

1. Government Institutions, such as Ministry of National Development Planning of the Republic of Indonesia/ National Development of Planning Agency (BAPPENAS), The Ministry of Agrarian and Spatial Planning/ National Land Agency (BPN) of the Republic of Indonesia, Regional Development of Planning Agency (BAPPEDA), State- Owned Company In all regions in Indonesia that uses urban and regional planning experts (Adhi Karya, Hutama Karya, etc.).
2. Private Business/Professional Institutions engages in urban planning. Both from Indonesia (Arkonin, etc.) and outside Indonesia (Aecom, dll)
3. State owned and private research institutes. Such as: LIPI, PULSE LAB Jakarta
4. Entrepreneur in Urban Planning

Network of Competencies

Figure 1. Course Diagram in Achieving Competencies for Master Program in Urban and Regional Planning

Matrix 0

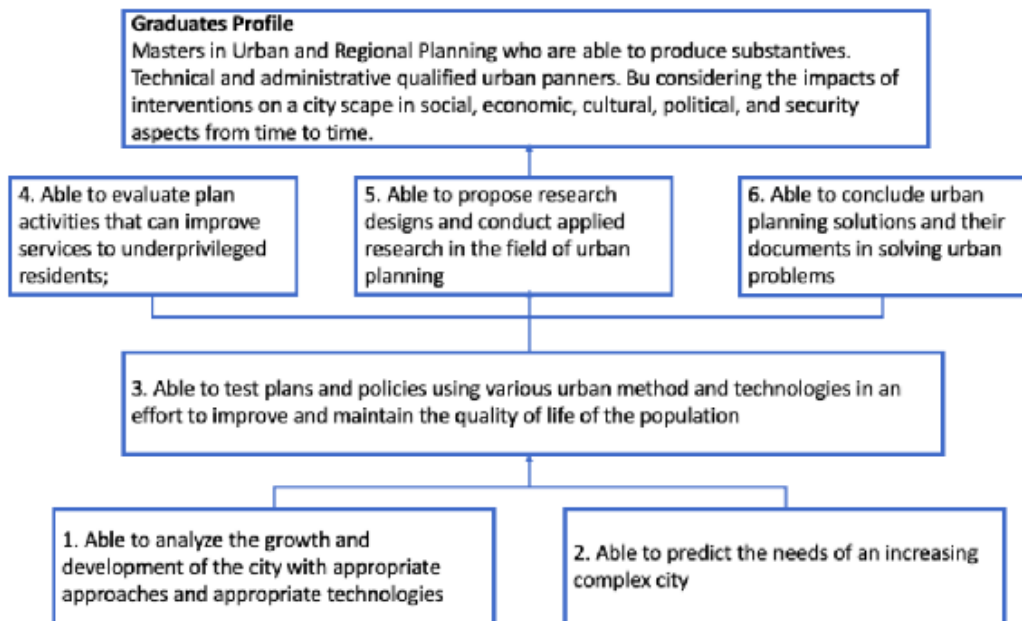


Table 1 Matrix 0 Study Program Master of Urban and Regional Planning

KKNI Level 8	General Competence	Outcome
1. Able to develop knowledge, technology, and or at in the field of science or professional practice through research, to produce innovative and tested works.	1. Able to analyze the growth of urban development with an appropriate technology approach; 2. Able to predict the needs of an increasingly complex city; 3. Able to conclude urban planning solutions and their documents in solving urban problems;	Theses. Papers, publication including thesis summary articles in journal format in the UI repository, Course Assignment report.
2. Able to solve problems of science, technology. And or art in the field of science through and inter or multidisciplinary approach.	4. Able to test plans and policies using various urban methods and technologies in an effort to improve and maintain the quality of life of the population.; 5. Able to plan activities that can improve services to underprivileged residents;	Course assignment report
3. Able to manage research and development that is beneficial to society and science. And is able to gain national and international recognition.	6. Able to propose research designs and conduct applied research in the field of urban planning.	Theses. Papers, publication including thesis summary articles in journal format in the UI repository.

Matrix 0A ATTITUDE FORMULATION

Every graduate of academic. Vocational and professional education programs must have the following attitudes:

- a. Fear God Almighty and be able to show a religious attitude;
- b. Upholding human values in carrying out tasks based on religion, morals and ethics;
- c. Contribute to the quality improvement of life in society, nation, state, and the progress of civilization based on Pancasila;
- d. Act as citizens who are proud and live their homeland, have nationalism and a sense of responsibility to the country and nation;
- e. Respects the diversity of cultures, views, religions, and beliefs, as well as the opinions or original findings of others;
- f. Work together and have social sensitivity and concern for society and the environment;
- g. Obey the law and discipline in the life of society and the state;
- h. Internalize academic values, norms, and ethics;
- i. Demonstrate a responsible attitude towards work in the field of expertise independently; and Internalize the spirit of independence, struggle, and entrepreneurship.

General Skills Formula

No	General Skills Formula for Master of Urban and Regional Planning (PWK)		Master Class Course
1.	Able to analyze growth and development of cities with appropriate approaches and technologies	Able to analyze community growth to understand developments that need to be planned	a. Urban and Regional Analysis b. Urban Planning Law
		Able to use appropriate approaches to analyze urban development	c. Planning Method and Theory d. Urban Theory and History e. Urban Housing and Settlement Theory
2.	Able to predict the needs of an increasingly complex city	Able to analyze urban infrastructure and transportation needs	a. Transport Planning and Policy b. Spatial Data Digitalization c. Project Investment and Finance d. Infrastructure Asset Management e. Transportation System f. Logistics Transportation
		Able to analyze urban spatial needs	g. Urban Design Theory h. Urban Studio i. Housing policy
		Able to analyze urban environmental management needs	j. Energy Efficient Building k. Water Resources Management l. Sustainable Infrastructure m. Watershed (DAS) Health Audit n. Data Management and Analysis o. Environmental Audit p. Life Cycle Analysis (LCA)
3.	Able to test plans and policies using a variety of urban methods and technologies to improve and maintain the quality of life of the population;	Able to use methods to test and evaluate city plans and policies	a. Urban Planning Law b. Housing Policy c. Water Resources Management d. Sustainable Infrastructure e. Energy Efficient Building f. Architecture And Sustainability Workshop
		Able to test efforts to improve the quality of life of city dwellers	g. Urban Studio h. Plan Making studio
4.	Able to plan activities that can improve services to underprivileged residents;	Able to propose activities that can improve services to underprivileged residents	a. Housing Policy b. Plan Making studio
		Able to produce draft regulations to improve services to citizens	c. Urban Planning Law d. Urban Studio



5.	Able to propose research designs and conduct applied research in the field of urban planning;		a. Thesis b. Scientific publications
6.	Able to conclude urban planning solutions and their documents in solving urban problems.	Able to produce city design that can solve urban problems	a. Urban Physical Planning b. Urban Studio c. Urban Planning Studio
		Able to formulate the system needed to plan the city	d. Housing Policy e. Property Workshop f. Water Resources Management g. Sustainable Infrastructure h. Infrastructure and Regional Development
		Able to formulate urban planning documents using appropriate methods to solve city needs from various economic, social, cultural, technological, and ecological aspects	i. Planning Method and Theory j. Plan Making Studio

Matrix 1

Table 2 Matrix 1 Master of Urban and Regional Planning

Group Level	Main Competencies	Supporting Competencies	Other Competencies
Basics and Personality			
Knowledge field	1. Able to analyze the growth and development of cities with appropriate approaches and technologies; 2. Able to predict the needs of an increasingly complex city		
Craftsmanship	3. Able to test plans and policies using various urban method and technologies in an effort to improve and maintain the quality of life of the population 4. Able to conclude urban planning solutions and their documents in solving urban problems. 5. Able to plan activities that can improve services to underprivileged residents	6. Able to propose research designs and conduct applied research in the field of urban planning;	
Work Behavior	7. Able to test and evaluate plans and policies using various urban methods and technologies in an effort to improve and maintain the quality of life of the population 8. Able to plan activities that can improve services to underprivileged residents		
Social life			

Matrix 2

Master's Study Program in Urban and Regional Planning

Table 3 Study Program Master of Urban and Regional Planning

No	Learning Objectives	Learning Experience		Main Substances and Sub-topics	Media and Technology	Course	Indicator	Assessment
		Sub-Objectives	Activity Method					
1	Able to analyze the growth and development of cities with appropriate approaches and technologies	Able to analyze community growth to understand developments that need to be planned	Lectures, Independent Assignments, Analysis, Literature Reviews, Observations, Discussions	Urban planning analysis method, using primary and secondary data; Defines a region; Analyze the demographic, social, and economic conditions of the region.	Laptop, LCD, Whiteboard, Internet	Urban and Regional Analysis	Students are able to perform and review various techniques, data sources, and skills to analyze the area from an economic, social and spatial perspective.	Written Examinations, Written Assignments, Presentations
			Lectures, Independent Assignments, Analysis, Literature Reviews, Discussions	legal framework in planning, the legal balance between the government's interest in promoting public welfare through land use regulation and the interest of private property owners in optimizing personal enjoyment and property value	Laptop, LCD, Whiteboard, Internet	Urban Planning Law	Students are able to use the legal framework in which planning takes place. In addition, students are also expected to emphasize the role of urban planning law in preparing local government responses to social, economic, and physical planning between local governments, central government, the private sector, and the community.	Written Examinations, Written Assignments, Presentations
		Able to use appropriate approaches to analyze urban development	Lectures, Independent Assignments, Literature Reviews, Case Studies, Discussions	A general outline of the city's history and human efforts to plan it; Connections between urban change, urban planning, and the forces of society that shape them; Aspects of urban theory and studies with current planning practice: Current debates about cities and their planning in historical contexts; Formulate questions for in-depth	Laptop, LCD, Whiteboard, Internet	Planning Method and Theory	Students are able to explain classical and contemporary planning theory, theoretical tools for planning analysis, intellectual dialogue through critical reading, information discussion and writing assignments	Written Examinations, Written Assignments, Presentations



				exploration in coursework and subsequent research.	Laptop, LCD, Whiteboard, Internet	Urban Theory and History	Students are able to explain the origin and evolution of cities, the process of urbanization, planning efforts in the 19th century, international influences, and urban issues such as segregation between races, housing market differences, and urban sprawl.	Written Examinations, Written Assignments, Presentations
				Lectures, Independent Assignments, Literature Reviews, Discussions	Impact of housing development planning	Laptop, LCD, Whiteboard, Internet	Urban Housing and Settlement Theory	Written Examinations, Written Assignments, Presentations
2	Able to predict the needs of an increasingly complex city	Able to analyze urban infrastructure and transportation needs		Lectures, Independent Assignments, Case Studies & Observations, Discussions	Transportation Policy Formulation; framework for assessing policy transportation - land use, accessibility, air pollution, noise, accidents and sustainability. Transport planning and policy and interaction with spatial planning. Institutional arrangements for transportation planning and management. Risk, uncertainty and complexity in determining transportation policy. Transport policies at the local, regional, metropolitan and national levels; logistics transportation policy	Laptop, LCD, Whiteboard, Internet	Transport Planning and Policy	Written Examinations, Written Assignments, Presentations
				Lectures, Independent Assignments,	Introduction to spatial data digitalization: digital data components, general planning	Laptop, LCD, Whiteboard,	Spatial Data Digitalization	Written Examinations, Written

	Literature Reviews & Case Studies, Discussions	knowledge, definition of spatial data digitization, types of digital data spatial, data digitization development methods	Internet	2. Able to use data interoperability 3. Able to develop spatial data processing skills	Assignments, Presentations
	Lectures, Independent Assignments, Literature Reviews & Case Studies, Discussions	Fundamentals of engineering economics; basics of technical economic analysis; decision making in engineering economics; initiation, depreciation, tax and sensitivity analysis; introduction to project funding; project funding structure; project funding sources; risk in project funding; project funding modeling; introduction to sharia-based project financing.	Laptop, LCD, Whiteboard, Internet	Project Investment and Finance	Written Examinations, Written Assignments, Presentations
	Lectures, Independent Assignments, Literature Reviews & Case Studies, Discussions	Infrastructure asset management, asset evaluation, asset valuation, optimization in asset management, asset allocation, risk management on infrastructure assets	Laptop, LCD, Whiteboard, Internet	Infrastructure Asset Management	Written Examinations, Written Assignments, Presentations
	Lectures, Independent Assignments, Case Studies and Reviews, Discussions	Transportation System Components, operating system, demand and supply	Laptop, LCD, Whiteboard, Internet	Transportation System	Written Examinations, Written Assignments, Presentations
	Lectures, Independent	Transport Policy	Laptop, LCD,	Logistics Transportation	Written Examinations,



		Assignments, Case Studies and Reviews, Discussions	Review of the understanding of urban design. Historical studies and discourses on what is meant by "good city" through the views of theorists, among others: cosmological beliefs, formalists, functionalists, picturesque, organics, utopians, livability, ecological. questioning the "performance dimension" in urban design theory and understanding the relationship between urban design and perceptual/visual/social dimensions. Once students are introduced to the theoretical view, in this section they will explore different ways of interpreting and understanding the urban environment. Discussions about how urban environments mean different things to different people, depending on their cultural, economic, racial and gender backgrounds. Brief review of the relationship between urban design activities and the political-economic context of the urban development process.	Whiteboard, Internet	Urban Design Theory	the preparation of transportation policy	Written Assignments, Presentations
	Able to analyze urban spatial needs	Lectures, Independent Assignments, Literature Reviews & Case Studies, Discussions	The site chosen is a piece of road or an area that is quite complex as far as possible and has a variety of elements and city elements so that it can provide opportunities for students to do "multiple analyses". Understand and apply the idea of "place making" in the private and public spheres, open spaces and	Laptop, LCD, Whiteboard, Internet	Urban Studio	Students can explain various theories and paradigms in urban planning thinking.	Written Examinations, Written Assignments, Presentations
		Lectures, Independent Assignment, Group Assignment, Analysis & Observations,		Studio, Panel, Drawing Tables, Model, Laptop LCD, Internet	Urban Studio	Students can apply urban design rules in stages, starting from arranging elements of urban spatial planning to compiling control devices for urban space use, with case studies of strips or mixed-use areas. Students are also equipped with the basics of urban design	Written Examinations, Written Assignments, Presentations



			buildings, to realize individual and community/public needs. Critically examine in a wider scale and context various types of city plans and regulations including master plans, zoning, UDGL, etc.	Laptop, LCD, Whiteboard, Internet	Housing Policy	Students are able to explore housing policy as a set of concepts that underlie the implementation of the housing sector in a country, including among others: understanding, objectives, characteristics, motives, scope, and implementation. Discussing housing policy and its relation to political, social, economic, cultural, and environmental aspects and their impact on housing management practices, including in the scope of architecture and the city.	Written Examinations, Written Assignments, Presentations
		Lectures, Independent Assignments, Case Studies & Observations, Discussions	Indonesia as an archipelagic country: developing country, economic disparity, and the formation of cities; Urbanization, migration: demographic characteristics of Indonesia; the constitution of society; Housing demand & supply (formal & informal sector); State politics and housing policy; Typology of housing provision in Indonesia (legal aspects; consumption mode; production mode); Housing economy and finance; land policy; Housing technology; Housing policies in Asian countries	Laptop, LCD, Whiteboard, Internet	Energy Efficient Building	Students understand the theoretical principles of energy-efficient building technology and can apply them to design climate-responsive and energy-efficient buildings	Written Examinations, Written Assignments, Presentations
	Able to analyze urban environmental management needs	Lectures, Independent Assignments, Discussions	Renewable energy, Climate and site, solar geometry, passive cooling, shading, natural & artificial light and solar cells.	Laptop, LCD, Whiteboard, Internet	Water Resources Management	Able to work independently or work together in teams to carry out assessments (evaluating complex design processes or results) on various aspects of the scope of Water Resources Management in solving water resources problems and able to present the results of the assessment in the form of written documents that	Written Examinations, Written Assignments, Presentations
		Lectures, Independent Assignments, Analysis and Case Studies, Discussions	Students are equipped with the ability to understand: 1. aspects of the principles and policies of water resources management (in Indonesia) and their developments; 2. aspects and models of integrated water resources management (IWRM) both on a national and national scale international; 3. management aspects based on government regulations and policies	Computer, LCD, Whiteboard, Internet			



			related to 3 (three) pillars of natural resource management, namely Utilization, Control of Water Damage, Conservation; 4. supporting aspects of water resources management which include hydro-economy; 5. Natural resource management case (or project), selected in a WPSA (Water Resources Management Area) or river basin	Computer, LCD, Whiteboard, Internet	Sustainable Infrastructure		systematic and able to communicate orally	
		Lectures, Independent Assignments, Case Studies and Reviews, Discussions	Introduction to sustainable infrastructure, Sustainable development, definition of sustainable infrastructure, elements of general planning knowledge, aspects of sustainable infrastructure pre-planning, development impacts, need for sustainable urban infrastructure development	Computer, LCD, Whiteboard, Internet	Sustainable Infrastructure		Able to span the impact of infrastructure development. Able to formulate sustainable infrastructure needs. Able to analyze aspects of infrastructure development	Written Examinations, Written Assignments, Presentations
		Lectures, Independent Assignments, Case Studies and Reviews, Discussions	Land Use Planning, Land Conservation, Water Borders, Ideal Site Design, Erosion & Sedimentation Control, Rain Management, Liquid Waste Management, Stakeholder Awareness.	Laptop, LCD, Whiteboard, Internet	Watershed (DAS) Health Audit		1. Able to apply a rapid assessment of the health of a watershed based on the Center for Watershed Protection method, 2. Able to categorize watershed health status based on impermeable land cover, water quality, and benthic macro diversity, and 3. Able to provide follow-up recommendations for improving watershed health	Written Examinations, Written Assignments, Presentations
		Lectures, Independent Assignments, Case Studies and Reviews, Discussions	Elements of general planning knowledge, the purpose and meaning of data management and analysis, types of data management and analysis, methods of data analysis and management	Laptop, LCD, Whiteboard, Internet	Data Management and Analysis		Students are able to develop data management technique. Able to use econometric analysis. Able to formulate data-based decisions	Written Examinations, Written Assignments, Presentations



		Lectures, Independent Assignments, Case Studies and Reviews, Discussions	Definitions, principles, concepts and environmental policies in Environmental Auditing. Legal Basis for Environmental Audit Policies and Regulations. Basic Principles of Environmental Auditing (Defining the main issues and scope of the audit). Understanding ISO 1400: Improved Environmental Management and Sustainable Development. A study of the Environmental Management Plan/RKL and Environmental Management Plan/RPL. Basic Principles of Auditing (Basic principles, procedures, hierarchies and processes in environmental auditing). Types of Audits (Revenue audits, waste audits, process audits). Audit Method (procedure for determination, weight, importance and valuation in environmental audit). Audit Documents. Audit Case Studies (case document studies).	Laptop, LCD, Whiteboard, Internet	Environmental Audit	Able to conduct audits and develop environmental audit reports	Written Examinations, Written Assignments, Presentations	
		Lectures, Independent Assignments, Case Studies and Reviews, Discussions	Overview Integrated Solid Waste Management, concept of sustainable solid waste management, development of IWMS (case studies and analysis), elements of IWM, solid waste generation and composition, waste collection, central sorting, biological treatment, thermal treatment, landfilling, material recycling, model: STAN 2, Prognosis, and IWM 2	Laptop, LCD, Whiteboard, Internet	Life Cycle Analysis (LCA)	Able to use a set of models to conduct an assessment of sustainable solid waste management	Written Examinations, Written Assignments, Presentations	
3	Capable to test the plans and policies by using various methods and urban technologies in an effort to increase	Capable to use methods to test and evaluate the urban policies and plans	Lecture, Individual Assignments, Studies and Case Study, Discussion	Legal framework in the planning, legal balance between Government's interests in promote the public wealth through the land use rules and private property owner's interests in optimizing the	Laptop, LCD, Whiteboard, Internet	Urban Planning Law	Students are capable to use the legal frameworks where the planning taken place. Besides, students encourage to emphasize the rules of urban planning law in arranging the	Written Examinations, Written Assignments, Presentations



and defend the inhabitant's life quality			private leisure and their property values	Laptop, LCD, Whiteboard, Internet	Housing Policy	Local Government's responses to the social, economic and physical planning between the Local Government, Private Sectors and people	Written Examinations, Written Assignments, Presentations
		Lecture, Individual Assignments, Studies and Case Study, Discussion	Indonesia as an archipelago; developed country, economic gap and city formation; Urbanization, migration, Indonesian demographic characteristics ; people's constitution ; Housing demand and offer (formal and informal sector); State's politics and housing policies ; Housing provision typologies in Indonesia (legal aspects ; consumption methods ; production mode) ; Finance and economic housings ; Land policies ; Housing technologies ; Housing policies in Asian countries			Students are capable to explore the housing policies as set of concepts that underlies the housing sector enforcements in a country, covers : Understanding, objectives, characteristics, motives, scopes and the implementations. Discuss the housing policy and its relations with the political, social, economic, cultural and environmental aspects and its impacts to the housing practices, including within the architecture and city scopes	Written Examinations, Written Assignments, Presentations
		Lecture, Individual Assignments, Studies and Case Study, Discussion	Students are given skill provisions to understand : 1. Principal aspects and water resources management policies (in Indonesia) and its developments 2. integrated aspects and models of water resource management (IWRM) both national and scale internationally; 3. management aspects based on government regulations and policies related to 3 (three) pillars of SDA management, namely Utilization, Damaged Power Control Water, Conservation; 4. supporting aspects of water resource management which include hydro economy; 5. SDA management case (or project), selected in a WPSA	Computer, LCD, Whiteboard, Internet	Water Resources Management	Able to work independently or work together in teams to assess (evaluate complex processes or design results) on various aspects of the scope of Water Resources Management (MSDA) in solving water resource problems and able to present the results of such assessments in the form of systematic written documents and able to communicate them orally	Written Examinations, Written Assignments, Presentations

			(Water Resources Management Area) or river area	Lecture, Individual Assignments, Studies and Case Study, Discussion	Introduction to water management for urban areas in spatial planning and city infrastructure; Types of resources, water allocation and availability of water; critical water quality and water use in an infrastructure perspective; Water quality and load urban waste in relation to causality and health risks; account load of solid waste pollution and liquid waste; Capacity and load assignment on surface water; Calculation of Total Maximum Daily Load (TMDL) on the body water; Technological and policy interventions in water and waste quality control urban areas; Water quality modeling (QUAL2E, Epanet, Aquatox); Case implementation water quality management for urban use software.	Computer, LCD, Whiteboard, Internet	Urban Water and Waste Quality Managemeng	Students are able to predict (C5) the capacity and load on surface water with water quality modeling software.	Written Examinations, Written Assignments, Presentations
			Renewable energy, Climate and site, solar geometry, passive cooling, shading, natural & artificial light and solar cells.	Lecture, Individual Assignments, Discussion	The results of the analysis will develop and apply the theory of building technology in a small-scale design research project.	Laptop, LCD, Whiteboard, Internet	Energy Efficient Building	Students understand the principles of energy-efficient building technology theory and can apply them to design climate-responsive and energy-efficient buildings	Written Examinations, Written Assignments, Presentations
	Able to test and evaluate efforts to improve the quality of life of the city's residents			Lecture, Individual Assignments,, Group Assignments, Analysis & Observation,		Studio, Panel, Drawing Table, Model, Laptop.	Architecture and Sustainability Workshop	Students can develop and apply building technology theory in a small-scale design research project.	Presentation Examinations, Weekly Assignments



			Literature Studies, Discussion	The site chosen is a piece of road or area that is as complex as possible and have a diversity of elements and elements of the city so as to provide opportunities for students in multiple analyses. Understanding and implementing the idea of "place making" in the private realm public, open spaces and buildings, to realize the needs of individuals and community/public. Critically reviewed in a broader scale and context of different types city plans and regulations including master plan, zoning, UDGL, etc.	LCD, Internet	Urban Studio	Students can apply the rules of urban design gradually, ranging from organizing elements of urban layout to putting together a control device for the use of city space, with case studies of strips or mixed-use areas. Students are also provided with the basic basis of urban design application by using the results of analysis conducted in depth and sharply on the context and issues of the region.	Presentation Examinations, Weekly Assignments
			Interactive Lecture Designing Practices Case Study Analysis & Observation Discussion	Contemporary and effective physical planning; Physical planning decision making process; Analysis of planning and make professional reports; Digital spatial data to create effective maps	Studio, Panel, Drawing Table, Model, Laptop, LCD, Internet	Plan Making Studio	Students are able to apply the principles of urban planning by considering the political constraints of planning, planning ethics, negotiation / facilitation / mediation techniques, scenarios, impact reviews, and evaluation of alternative solutions.	Written Examinations, Written Assignments, Presentations
4	Able to plan activities that can improve services to underprivileged residents.	Able to propose activities that can improve services to underprivileged residents	lecture. Independent task, Case Studies & Observations, Discussion	Indonesia as an archipelagic country; developing country, economic disparity, and the formation of cities; Urbanization, migration; demographic characteristics of Indonesia; the constitution of society; Housing demand & supply (formal & informal sector); State politics and housing policy; Typology of housing provision in Indonesia (legal aspects; mode of consumption; mode of production); Housing economics and finance;	Laptop, LCD, Whiteboard, Internet	Housing Policy	Students are able to explore housing policy as a set of concepts that underlie the implementation of the housing sector in a country, including among others: understanding, objectives, characteristics, motives, scope, and implementation. Discussing housing policy and its relation to political, social, economic, cultural, and environmental aspects and their impact on	Written examination, Written Assignments, Presentations



			land policy; Housing technology; Housing policies in Asian countries	Studio, Panel, Drawing Desk, Model, Laptop LCD, Internet	Plan Making Studio	housing management practices, including in the scope of architecture and the city.	Presentation Examinations, Weekly Assignments
		lecture, Independent task, Group task, Analysis & Observation, Literature Review, Discussion	Contemporary and effective physical planning; Physical planning decision-making process; Planning analysis and make professional reports; Digital spatial data to create effective maps	Studio, Panel, Drawing Desk, Model, Laptop LCD, Internet	Plan Making Studio	Students are able to apply the principles of urban planning by considering the political constraints of planning, planning ethics, negotiation / facilitation / mediation techniques, scenarios, impact review, and evaluation of alternative solutions.	Presentation Examinations, Weekly Assignments
	Able to produce draft regulations to improve services to citizens	lecture, Independent Assignments, Analysis, Literature Review, Case Studies, Discussion	the legal framework in planning, the legal balance between the government's interest in promoting the general welfare through land use regulations and the interests of private property owners in optimizing their personal enjoyment and property value	Laptop, LCD, Whiteboard, Internet	Urban Planning Law	Students are able to use the legal framework in which planning takes place. In addition, students are also expected to emphasize the role of urban planning law in preparing local government responses to social, economic, and physical planning between local governments, central government, the private sector, and the community.	Written examinations, Written Assignments, Presentations
		lecture, Independent task, Analysis, Literature Review, Case Studies, Discussion	The selected site is a piece of road or an area that is as complex as possible and has a variety of urban elements so it can provide opportunities for students to perform multiple analyses. Understand and apply the idea of "place making" in the private and public sphere, open spaces and buildings, to fulfil individual and community/public needs. Critically examine in a wider scale and context various types city plans and regulations including master plan, zoning, UDGL, etc.	Studio, Panel, Drawing Desk, Model, Laptop LCD, Internet	Urban Studio	Students can apply urban design rules in stages, starting from arranging elements of urban spatial planning to compiling control devices for urban space use, with case studies of strips or mixed-use areas. Students are also equipped with the basics of urban design applications using the results of an in-depth and sharp analysis of regional contexts and issues.	Written examinations, Written Assignments, Presentations



5	Able to propose research designs and conduct applied research in the field of urban planning		Independent task	Defining the issues discussed, clearly formulated research questions, objectives in conduct research. Theoretical footing, selection of strategies or methods, disclosure of facts and synthesis of material that leads to answers to research questions, conclusions.		Thesis	Students are able to complete research in accordance with the theme and scope that has been approved by	Written examinations, Written Assignments, Presentations
			Independent task	The rules of scientific writing; various modes of scientific writing; strategy for formulating arguments in scientific writings that clearly show a position against existing knowledge; publication procedures in national/international seminars/conferences; publication procedures in international reputable journals; review of articles in internationally reputed journals in the field of related to urban and regional planning.		Scientific Publication	Students are able to complete research according to the theme and scope that has been approved by the supervisor	Written examinations, Written Assignments, Presentations
6	Able to conclude urban planning solutions and their documents in solving urban problems	Able to produce city design that can solve urban problems	Interactive Lecture Designing Practice Case study Analysis & Observation Discussion	Contemporary and effective physical planning; Physical planning decision-making process; Planning analysis and make professional reports; Digital spatial data to create effective maps	Studio, Panel, Drawing Desk, Model, Laptop LCD, Internet	Urban Physical Planning	Students are able to explain the principles of physical planning and apply principles and methods in urban planning project assignments	Presentation Examinations, Weekly Assignments



			Interactive Lecture Designing Practice Case study Analysis & Observation Discussion	The selected site is a piece of road or an area that is as complex as possible and has a variety of urban elements so it can provide opportunities for students to perform multiple analyzes. Understand and apply the idea of "place making" in the private and public sphere, open spaces and buildings, to fulfil individual and community/public needs. Critically examine in a wider scale and context various types city plans and regulations including master plan, zoning, UDGL, etc.	Studio, Panel, Drawing Desk, Model, Laptop LCD, Internet	Urban Studio	Students can apply urban design rules in stages, starting from arranging elements of urban spatial planning to compiling control devices for urban space use, with case studies of strips or mixed-use areas. Students are also equipped with the basics of urban design applications using the results of an in-depth and sharp analysis of regional contexts and issues.	Presentation Examinations, Weekly Assignments
			Interactive Lecture Designing Practice Case study Analysis & Observation Discussion	Contemporary and effective physical planning; Physical planning decision-making process; Planning analysis and making professional reports; Digital spatial data to create effective maps	Studio, Panel, Drawing Desk, Model, Laptop LCD, Internet	Urban Planning Studio	Students are able to apply the principles of urban planning by considering the political constraints of planning, planning ethics, negotiation / facilitation / mediation techniques, scenarios, impact review, and evaluation of alternative solutions.	Presentation Examinations, Weekly Assignments
	Able to formulate the system needed to plan the city		lecture, Independent task, Case Studies & Observations, Discussion	Indonesia as an archipelagic country; developing country, economic disparity, and the formation of cities; Urbanization, migration: demographic characteristics of Indonesia; the constitution of society; Housing demand & supply (formal & informal sector); State politics and housing policy; Typology of housing provision in Indonesia (legal aspects; consumption mode; production mode); Housing economics and finance; land policy; Housing technology; Housing policies in Asian countries	Laptop, LCD, Whiteboard, Internet	Housing Policy	Students are able to explore housing policy as a set of concepts that underlie the implementation of the housing sector in a country, including among others: understanding, objectives, characteristics, motives, scope, and implementation. Discussing housing policy and its relation to political, social, economic, cultural, and environmental aspects and their impact on housing management practices, including in the scope of architecture and the city.	Written Examinations, Written Assignments, Presentation



				Dreams & products; product (preferred); residential property, commercial/retail property, office building/work property; money issues/feasibility studies; products & users / lifestyle; management aspects of property products; Proposed (future) products: residential property, commercial/retail property, office building/work property; finance & management.	Laptop, LCD, Whiteboard, Internet	Property Workshop	Students apply the link between architecture and real estate activities in a small-scale project. Related to the innovation of places for human activities such as new building types, lifestyles, market segmentation, and others.	Presentation Examinations, Weekly Assignments
				Students are equipped with the ability to understand: 1. aspects of water resources management principles and policies (in Indonesia) and their developments; 2. aspects and models of integrated water resources management (IWRM) both on a national and international scale; 3. management aspects based on government regulations and policies related to 3 (three) pillars of natural resource management, namely Utilization, Control of Water Damage, Conservation; 4. supporting aspects of water resources management which include hydro-economy; 5. Natural resource management case (or project), selected in a WPSA (Water Resources Management Area) or river basin	Computer, LCD, Whiteboard, Internet	Water Resources Management	Able to work independently or work together in teams to carry out assessments (evaluating results) on various aspects of the scope of Water Resources Management (MSDA) in solving water resources problems and able to present the results of the assessment in the form of written documents that systematic and able to communicate orally	Written Examinations, Written Assignments, Presentations
				Introduction to urban water management in urban spatial planning and infrastructure; Types of resources, water allocation and water availability; Critical of water quality and water use in infrastructure perspective; Water	Computer, LCDs, whiteboards, Internet	Urban Water and Waste Quality Management	Students are able to predict (C5) the carrying capacity and load on surface water with water quality modeling software.	Written Examinations, Written Assignments, Presentations



			quality and urban effluent load in causality and health risk relationship; Calculation of the pollution load of solid waste and liquid waste; Determination of the capacity and load on surface water; Calculation of Total Maximum Daily Load (TMDL) in water bodies; Technological and policy interventions in urban water and sewage quality control; Water quality modelling (QUAL2E; Epanet, Aquatox...); Application of water quality management cases for cities using software.							
			lecture, Independent task, Group task, Case Studies & Observations, Discussion			Computer, LCDs, whiteboards, Internet	Infrastructure and Regional Development	1. Able to identify and analyze the infrastructure development of a region related to the regional economy 2. Be able to explain the conception of the relationship between planning and infrastructure development in an area and its relationship to the regional economy		Written Examinations, Written Assignments, Presentations
			lecture Self-Help Tasks, Literature Studies, Case Studies, discussion			Laptop, LCD, Whiteboard, Internet	Planning Method and Theory	Students are able to explain classical and contemporary planning theory, theoretical tools for planning analysis, intellectual dialogue through critical reading, information discussion and writing tasks		Written Examinations, Written Assignments, presentations
			Able to formulate city planning documents using appropriate methods to solve the needs of cities from various aspects of economic, social, ecological, technological, and cultural							

			exploration in courses and subsequent research.	Contemporary and effective physical planning; Physical planning decision making process; Analysis of planning and make professional reports; Digital spatial data to create effective maps	Studio, Panel, Desk Image, LCD Model, Laptop, Internet	Plan Making Studio	Students are able to apply the principles of urban planning by considering the political constraints of planning, planning ethics, negotiation / facilitation / mediation techniques; scenarios, impact reviews, and evaluation of alternative solutions.	Written Examinations, Written Assignments, presentations
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Curriculum Structure Magister of Urban and Regional Planning

Code	Subject	SKS
1st Semester		
ENUP80001	Planning Method and Theory	3
ENUP80002	Urban and Regional Analysis	3
ENUP80003	Urban Theory and History	3
ENUP80004	Urban Planning Law	3
	Sub Total	12
2nd Semester		
ENUP80005	Urban Physical Planning	3
ENUP80006	Plan Making Studio	5
	Elective Course	3
	Sub Total	11
3rd Semester		
	Elective Course	3
	Elective Course	3
ENUP80007	Pre-Thesis	4
	Sub Total	10
4th Semester		
ENUP80008	Thesis	4
ENUP80009	Scientific Publication	2
	Elective Course	3
	Sub Total	9
	Total	42

List of Elective Courses

Code	Subject	SKS
Urban Spatial Planning		
ENAR800009	Urban Studio 1	5
ENAR800021	Urban Studio 2	5
ENAR800015	Urban Design Theory	3
ENAR800011	Property Workshop 1	5
ENAR800023	Property Workshop 2	3
ENAR800038	Housing Policy	3
ENAR800016	Urban Housing and Settlement Theory	3

ENUP80011	Data Management and Analysis	3
ENUP80012	Spatial Data Digitalization	3
Urban Environmental Planning		
ENAR800032	Energy Efficient Building	3
ENAR800013	Architecture and Sustainability Workshop 1	5
ENCV800401	Water Resources Management	3
ENCV803402	Watershed (DAS) Health Audit	3
ENCV802105	Environmental Audit	3
ENCV802202	Life Cycle Analysis (LCA)	3
ENUP80013	Sustainable Infrastructure	3
Infrastructure and Transportation Planning		
ENCV803602	Infrastructure Asset Management	3
ENUP80010	Infrastructure and Regional Development	3
ENCV801502	Transportation System	3
ENCV802502	Transport Planning and Policy	3
ENCV803508	Logistics Transportation	3
ENCV801601	Project Investment and Finance	3

Master By Research

Code	Subject	SKS
1st Semester		
ENUP800102	Research Proposal Examination	4
ENUP800101	Scientific Seminar	8
2nd Semester		
ENUP800203	Proceeding Publication	4
ENUP800204	Research Result Examination	6
3rd Semester		
ENUP800105	Journal Publication	8
4th Semester		
ENUP800206	Master Thesis	10

Course Syllabus

Syllabus of Required Courses Program Master of Regional and Urban Planning

Planning Method and Theory

ENUP80001

3 Credits

Objectives :

Understand the theory of change, combining elements of engineering, policy, politics, and narrative for planning. Understanding evolution and interconnectedness between key planning approaches and theoretical perspectives on them, including comprehensive (rational) planning; additional, strategic, and communicative planning; advocacy and equality planning; and radical/rebel planning.

Syllabus:

Elements of general planning knowledge, purpose and meaning of planning, planning theory, planning timeframe, global dimension of planning, professional values and ethics, fairness, diversity and social justice, governance and stakeholder participation, and community members in planned change.

Preconditions: -

Textbooks:

1. Bracken, I. (2014). Urban planning methods: Research and policy analysis. Routledge.
2. Wang, X., & Hofe, R. (2008). Research methods in urban and regional planning. Springer Science & Business Media.
3. Ethics and Professional Conduct <https://www.planning.org/ethics/ethicscode/> and APA Ethical Principles in Planning, <https://www.planning.org/ethics/ethicalprinciples/>.
4. Friedmann, John. (2005). Planning cultures in transition. In Comparative Planning Cultures, Bishwapriya Sanyal, ed. (pp. 53-68). Routledge.
5. Banerjee, T. (2005). Understanding planning cultures: The Kolkata paradox. In Comparative Planning Cultures, Bishwapriya Sanyal, ed. (pp. 169-188). Routledge.
6. Fainstein, Susan. 2010. "Introduction: Toward an Urban Theory of Justice," in The Just City (pp. 1-22). Ithaca, NY: Cornell University Press

Urban and Regional Analysis

ENUP80002

3 Credits

Objectives :

Understand common methods of urban planning analysis, both using primary and secondary data. Have the knowledge and skills to define a region and describe and analyze the demographic, social, and economic conditions of a region.

Syllabus:

Defining and mapping regions, analyze demographic data, introduction to SPSS, measure economic data, collect and ethics primary data, quantitative data analysis.

Preconditions: -

Textbooks:

1. Marisa Zapata's Engaging the Future: Forecasts, Scenarios, Plans, and Projects.
2. Isserman, A. M. (2007). Forecasting to learn how the world can work. Engaging the future: Forecasts, scenarios, plans, and projects.

Urban Theory and History

ENUP80003

3 Credits

Objectives :

By the end of the course, students will be able to:

1. Understand generally about the history of cities and human effort in the development plan of the city;
2. Identify major events, movements, ideas, and people that have significantly influenced the city and the urban planning professions;
3. Create links between urban development, urban planning, and the power of society that shape a community in an urban area.
4. Create links between theoretical aspects and urban studies and current best practice in urban planning
5. Engage in current debates and/or discussion about cities and its historical plan.

Syllabus:

Introductory and The Early History of City; Industrialization, Major Urban Theory, and The Origins of Urban Planning; Modernism, Suburbanization, and City Conflicts; and Postmodernism, Economic Knowledge, and Globalization.

Preconditions: -

Textbooks:

1. Garvin, Alexander (2002). *The American City: What Works and What Doesn't*. New York: McGraw Hill. ISBN 978-0-07-137367-8. (A standard text for many college and graduate courses in city planning in America)
2. Brenner, N. and C. Schmid. 2015. "Towards a New Epistemology of the Urban?" *City*. 19 (2-3): 151-182.
3. *The City in History*, Lewis Mumford, 1961
4. *Town Planning in practice*, Raymond Unwin, 1909
5. "The City Shaped: Urban Patterns and Meanings Through History", Spiro Kostof, 2nd Edition, Thames and Hudson Ltd, 1999 ISBN 978-0-500-28099-7
6. *The American City: A Social and Cultural History*, Daniel J. Monti, Jr., Oxford, England and Malden, Massachusetts: Blackwell Publishers, 1999. 391 pp. ISBN 978-1-55786-918-0.
7. Garvin, Alexander (2002). *The American City: What Works and What Doesn't*. New York: McGraw Hill. ISBN 978-0-07-137367-8. (A standard text for many college and graduate courses in city planning in America)
8. Pow, C-P. 2012. "China Exceptionalism? Unbounding Narratives on Urban China." In *Urban Theory Beyond the West*, Edensor, T., and M. Jayne (Eds.). New York, NY: Routledge. (pp. 47-64).
9. Abu-Lughod, J.L. 1993. "The Islamic City: Historic Myth, Islamic Essence, and Contemporary Relevance." In *Urban Development in the Muslim World*, Amirahmadi, H. and S.S. El-Shakhs (Eds.). New Brunswick, NJ: Center for Urban Policy Research. (pp. 11-36)
10. King, A.D. 2015. "Colonialism and Urban Development." In *Cities of the Global South Reader*, Miraftab, F. and N. Kudva (Eds.). New York, NY: Routledge. (pp. 29-39).
11. Frank, A.G. 1989 (1966 reprint). "The Development of Underdevelopment." *Monthly Review*. 41 (2): 37-45.

Urban Planning Law

ENUP80004

3 Credits

Objectives :

Students will be able to use the legal framework in

planning process. Students will be able to emphasize the role of urban planning law in formulating local government strategies to tackle the social, economic, and physical issues between local government, central government, the private sector, and the local community.

Syllabus:

The legal framework in urban planning, the legal balance between government's interest in promoting the general welfare through land-use regulation and the interest of private property owners in optimizing their personal satisfaction and property value.

Preconditions: -

Textbooks:

1. Undang-Undang Nomor 26 Tahun 2007 Tentang Penataan Ruang
2. Undang-Undang Nomor 34 Tahun 2009 Tentang Pedoman Pengelolaan Kawasan Perkotaan
3. Peraturan Menteri Dalam Negeri Nomor 1 Tahun 2008 Tentang Pedoman Perencanaan Kawasan Perkotaan
4. Peraturan Menteri Dalam Negeri Nomor 1 Tahun 2007 Tentang Penataan Ruang Terbuka Hijau Kawasan Perkotaan

Urban Physical Planning

ENUP80005

3 Credits

Objectives :

By the end of the course, students will be able to:

1. Understand the contemporary and effective city planning.
2. Understand the physical city planning decision-making process
3. Learn how to use Adobe Software to communicate planning analysis and construct professional reports.
4. Learn how to use digital spatial data to create effective maps.

Syllabus:

Land use control, built environment, interpretation and map-making skills, introduction to urban planning softwares, site-scale and regional-scale natural system analysis, socio-economic analysis, site engineered analysis, site layout, and small-scale area planning.

Preconditions:

Student has taken Design Methods, City and Regional Analysis, Theory and History of Urban, and Urban Planning Law

Textbooks:

1. Urban Development: The Logic Of Making Plans, Lewis D. Hopkins, Island Press, 2001. ISBN 978-1-55963-853-1
 2. Planning for the Unplanned: Recovering from Crises in Megacities, by Aseem Inam (published by Routledge USA, 2005). ISBN 978-0-415-95130-2
 3. Planning the Twentieth-Century American City, Christopher Silver and Mary Corbin Sies (Eds.), Johns Hopkins University Press, 1996
 4. City Planning According to Artistic Principles, Camillo Sitte, 1889
 5. Nino, F. S. (2016, October 20). The New Urban Agenda: Key Commitments. Retrieved October 23, 2017, from <http://www.un.org/sustainabledevelopment/blog/2016/10/newurbanagenda/>
 6. Gabbatt, A. (2017, August 28). What makes Houston so vulnerable to serious floods? Retrieved October 23, 2017, from <http://www.theguardian.com/us-news/2017/aug/28/houston-harvey-risk-floods-analysis>
 7. Chapter 3: The City Image and Its Elements in Lynch, K. (1960). The image of the city (Vol. 11). MIT press.
 8. Chapter 1: Framing the Land Use Planning Process in Berke, P., Godschalk, D. R., Kaiser, E. J., & Rodriguez, D. (2006). Urban land use planning. University of Illinois Press.
 9. Miles, M. E., Berns, G. L., Eppli, M. J., & Weiss, M. A. (2007). Real estate development: principles and process: Urban Land Institute. Urban Land Institute.
- Chapter 3: Developers and Their Partners
 - Chapter 13: Stage Three: The Feasibility Study Supplemental:

Plan Making Studio**ENUP80006****5 Credits****Objectives :**

Students will be able to collect the required data, analyze the city as a system and/or organism. Students will be able to estimate the urban growth

and the needs of urban development as well as to integrate various data into a reliable planning concept. In addition, student will be able to construct an informative report.

Syllabus:

Urban planning products, Urban Planning processes and procedures, Data and Planning, Digital Data Processing, Analysis and Projection Techniques in planning, Multilevel, cross-sector, and inter-actor planning concepts, Urban Planning Scenarios, Urban Development Priorities, Criticism and Innovation of City Planning.

Preconditions:

Student has taken Physical Planning at The City Scale

Textbooks:

1. Schwabish, Jonathan. 2017. Better Presentations: A Guide for Scholars, Researchers, and Wonks. Columbia University Press.
2. Ryser, Judith and Franchini, Teresa. International Manual of Planning Practice – ISOCARP Publication
3. AICP Code of Ethic and Professional Conduct.
4. Duhl, L.J. & Sanchez, A.K. 1999. Healthy Cities and The City Planning Process. WHO Publication
5. Speck, Jeff. 2018. Walkable City Rules: 101 Steps to Making Better Places. Island Press.
6. Toderian, Brian. 2019. 10 keys to making a great city plan. Planetizen Magazine. <https://www.planetizen.com/node/80720/10-keys-making-great-city-plan>
7. UN Habitat, 2015. International Guidelines of urban and territorial planning. https://www.uclg.org/sites/default/files/ig-utp_english.pdf
8. Kode Etik Perencana, IAP
9. Standar Kompetensi Kerja Nasional Indonesia (SKKNI), Permenakertrans No. 177/2015.
10. Permen ATR No. 1 dan No 16 Tahun 2018 tentang Pedoman Penyusunan RTRW dan RDTR/PZ
11. Permen PUPR No. 6 Tahun 2006 tentang RTBL Perkotaan

Pre-Thesis**ENUP80007****4 Credits****Objectives :**

Able to observe the world's phenomena related to urban and regional planning and formulate the

initial ideas as the issues to be developed further. Able to develop further skills in reading, review the literature and develop the method to provides a comprehensive overview of the thesis process.

Syllabus:

Defining the issues discussed, clearly formulated research questions, the purpose of conducting the research. Theoretical base, choosing a strategy or method, revealing facts and synthesizing materials that lead to answers to research questions, hypothesis.

Preconditions: Have taken the course research method

Textbooks:

Thesis

ENUP80008

4 Credits

Objectives :

Able to find, study and communicate issues in a special study area related to architecture. Able to develop further skills in reading, research and writing a thesis. For the research thesis track: a thesis that no more than 20,000 words. For the thesis design track: the draft is accompanied by a thesis that no more than 10,000 words and a portfolio design that provides a comprehensive overview of the design process.

Syllabus:

Defining the issues discussed, clearly formulated research questions, the purpose of conducting the research. Theoretical base, choosing a strategy or method, revealing facts and synthesizing materials that lead to answers to research questions, conclusions.

Preconditions: Have taken the course

Textbooks:

Scientific Publication

ENUP80009

2 Credits

Objectives :

Students will be able to produce a scientific writing on the results of studies or the research with a decent quality to be published in national or international level dissemination forums.

Syllabus:

The rules of scientific writing; various modes of scientific writing; the argument formulation strategy in scientific writing that clearly shows the position

on existing knowledge; publication procedures in national/international seminars/conferences; publication procedures in international reputable journals; article review in internationally reputed journals in architecture-related fields.

Preconditions: -

Textbooks: -

Elective Course Description

Infrastructure and Regional Development

ENUP80010

3 Credits

Objectives :

1. Able to identify and analyze the infrastructure development of a region related to the regional economy.
2. Able to explain the concept of the relationship between planning and infrastructure development in an area and its relationship to the regional economy.

Syllabus:

Preliminary; Regional Development Theory; Developing the Concept of Transport Spatial Planning and Strategic Areas; Determining the Area of Influence of Infrastructure; Urban and Rural Area Development; Development and Spatial Planning of Coastal Areas; Future Spatial Planning; Developing Economic Corridors; Regional Connectivity; ASEAN Regional Connectivity; Regional Development Financing; Infrastructure in Regional Development; Case study of Infrastructure in Regional Development.

Preconditions:

Textbooks:

1. Bambang Susantono, Ph.D. Infrastructure and Regional Development in Indonesia. 2015. Delft Academic Press. ISBN: 978-90-6562-323-2.
2. Prof. Dr. Rahardjo Adisasmita, M.Ec. Ekonomi Tata Ruang Wilayah. 2014. Graha Ilmu. ISBN: 978-602-262-225-3.
3. Wong, Cecilia. Indicators for Urban and Regional Planning: The Interplay of Policy and Methods. 2006. The RTPI Library Series. ISBN: 0-415-27452-4.
4. Stevenson, Deborah. Cities and Urban Cultures. 2003. Open University Press. ISBN: 0-335-20844-4.
5. Ed: Taylor, Peter J, Derudder, Ben, Saey, Pieter

and Witlox, Frank. Cities in Globalization: Practices, Policies and Theories. Routledge Taylor and Francis Group. ISBN: 978-0-415-40984-1.

Data Management and Analysis

ENUP80011

3 Credits

Objectives :

1. Able to develop data management techniques from a city or a regional area
2. Able to use econometric analysis in urban and regional planning
3. Able to formulate data-base decisions as one of problem-solving approaches.

Syllabus:

This course introduces several types of data management and their management techniques in the context of urban and regional planning. This course includes econometric analysis of the integration of several data sources. This course assists urban planners in management-based decision-making and data analysis. This course involves Elements of general planning knowledge, the purpose and meaning of data management and analysis, types of data management and analysis, methods of data analysis and management.

Preconditions: Course Urban Planning Theories and Methods

Textbooks:

1. R. Legates. The City Reader, 2nd Ed. Routledge
2. Henri Pirenne. The Medieval Cities: Their Origins and The Revival Trade. Princeton University Press. 1969
3. Aristoteles. The Politics (especially Book III and Book VII). Penguin Classics. Revised Edition. 1981

Spatial Data Digitalization

ENUP80012

3 Credits

Objectives :

1. Able to analyze multi-source digital data related to urban and regional planning
2. Able to use data interoperability in supporting the assignments
3. Able to develop spatial data procession skills related to spatial data management

Syllabus:

This course also encourages students to use data interoperability and assists urban planners in developing spatial data skills, especially those based on digital spatial data. This course includes Digital data components, general planning knowledge, definition of spatial data digitization, types of digital data spatial, data digitization development methods

Preconditions: Course Urban Planning Theories and Methods

Textbooks:

1. Future Cities Lab (2015). URscape: Introduction
2. Mans, U., Giest, S., & Baar, T. (2018). Can Big Data Make a Difference for Urban Management? In T. Elmqvist, X. Bai, N. Frantzeskaki, C. Griffith, D. Maddox, T. McPhearson, et al. (Eds.), Urban Planet: Knowledge towards Sustainable Cities (pp.218-238). Cambridge: Cambridge University Press. doi:10.1017/9781316647554.013
3. ADB (2021). Link: https://events.development.asia/system/files/materials/2021/06/202106-penggunaan-data-spasial-untuk-perencanaan-kota-tangguh-pandemi_0.pdf
4. ISO 19115:2014

Sustainable Infrastructure

ENUP80013

3 Credits

Objectives :

1. Able to span the impact of infrastructure development in the context of sustainability
2. Able to formulate the needs of sustainable infrastructure towards sustainable cities
3. Able to analyse aspects of infrastructure pre-planning related to sustainability aspects (economic, social and environment).

Syllabus:

An understanding of sustainability aspects in infrastructure planning related to urban development will be able to span the impacts of urban area development. This course analyses the need for sustainable city-based infrastructure development and discusses aspects of pre-planning and impact analysis. This course delivers understanding of sustainable development, definition of sustainable infrastructure, elements of general planning knowledge, aspects of sustainable infrastructure pre-planning, development impacts, need for sustainable urban infrastructure development.

Preconditions: Course Urban Planning Theories and

Methods

Textbooks:

1. Graham Hughton, et.al, Sustainable Cities, Cromwell Press, 1995
2. Graham, P. Building Ecology. First Principles for a Sustainable Built Environment, Wiley-Blackwell, 2012
3. Stephen Graham & Simon Marvin, Splintering Urbanism: Networked Infrastructures, Technological Mobilities, and the Urban Condition, 2001
4. R. Legates. The City Reader, 2nd Ed. Routledge

Urban Studio 1

ENAR800009

5 Credits

Objectives :

Provides the urban design principle's basics of analysis and skills in stages, starting from arranging elements of urban spatial planning to setting control tools for the use of urban space in a certain extent, with studio objects/cases like strips or mixed-used environments/areas. Students are introduced to the basics of urban design practice using the results of an in-depth and sharp analysis of regional contexts and issues.

Syllabus:

The selected site is a part of road or an area that is complex enough and has a variety of factors and city elements so that it can provide opportunities for students to do "multiple analysis". The students should understand and apply the idea of "place making" both in the private and public space, open spaces, and buildings, to be able to realize individual and community/public needs. Critical examination in a wider scale and context of various types of cities plans and regulations, including master plans, zoning, UDGL, etc., is also included in the course.

Preconditions: -

Textbooks:

1. Carmona, Matthew et.al, Public Spaces Urban Spaces. Oxford: Architectural Press, 2003
2. Gehl, Jan, How to Study Public Life, Copenhagen: Island Press, 2013
3. Hester, Randolph T., Design for Ecological Democracy, Cambridge, MA: The MIT Press, 2010
4. Shane, Graham, Recombinant Urbanism. Great Britain: John Wiley & Sons, 2005

5. Jacobs, Allan B., Looking at Cities. Cambridge, MA: Harvard University Press, 1985
6. Krier, Rob, Urban Space. New York: Rizzoli Int. Publication, 1970
7. Lynch, Kevin, Good City Form. Cambridge, MA: MIT Press., 1984
8. Larice, Michael, Urban Design Reader, London: Routledge, 2012
9. National Association of City Transportation Officials, Urban Street Design Guide, Copenhagen: Island Press, 2013
10. Rossi, Aldo, The Architecture of the City. Cambridge, MA: MIT Press, 1982

Urban Studio 2

ENAR800021

5 Credits

Objectives :

By taking advantage of the UI Depok campus location in a satellite city of Jakarta, the studio's main objective is to broaden students' insight, understanding, knowledge and skills (mastery) on the principles of sustainable urban design, learning from study case in Jakarta and/or Bodetabek areas. Students are encouraged to explore the complexities of urban problems faced by Jakarta as a megacity, including (for example) density, urbanization, flooding, energy, and climate change. It is hoped that these issues will be able to trigger student's creativity to produce innovative and scientifically justified city design, both from social and environmental perspective.

Syllabus:

Advancing from the Urban Design Studio 1, in this studio, students are asked to explore various aspects of urban design connectivity through re-designing mixed use (residential-commercial) project. Students are triggered to redesign an area that is undergoing a transition process because of the radical changes that are happening. The studio was organized with the initial premise that public spaces play an important role in creating a comfortable and lively city, but its design "platform" still needs to rely on user aspirations. This studio's challenge is the position of urban design that must give respect and attention to other aspects behind the architectural form and the physical condition of the city. In addition, in completing urban design projects, students are required to use "local character" as a keyword.

Preconditions: Completed Urban Design Studio 1

Textbooks:

1. Protzen, Jean-Pierre and Harris, David J., Universe of Design: Horst Rittel's Theories of Design and Planning, London and New York: Routledge (2010)
2. Rutz, Werner: Cities and Towns in Indonesia, Stuttgart: Gebruder Borntraeger (1987)
3. Ricky Burdett (Editor), Deyan Sudjic (Editor), 2010, Living in the Endless City: The Urban Age Project by the London School of Economics and Deutsche Bank's, Alfred Herrhausen Society, Phaidon Press
4. Ricky Burdett (Editor), Deyan Sudjic (Editor) 2008. the Endless City, Phaidon Press
5. Mohsen Mostafavi (Author), Gareth Doherty (Author), 2010, Harvard University Graduate, Ecological Urbanism, Lars Muller Publishers
6. Charles Montgomery (2014). Happy City: Transforming Our Lives Through Urban Design, Farrar Straus Giroux
7. Abeyasekera, S. (1987). Jakarta: A History, Oxford: Oxford University Press.
8. Certeau, M.D. (1984). The Practice of Everyday Life. Berkeley: University of California Press.
9. Silver, C. (2011). Planning the Megacity: Jakarta in the Twentieth Century. New York: Routledge
10. Tunas, D. (2008). The Spatial Economy in the Urban Informal Settlement. Netherland: International Forum on Urbanism

Urban Design Theory

ENAR800015

3 Credits

Objectives :

Describing how built-environment planning and design contribute to the establishment of a good city through analysis of both traditional and contemporary urban design theory, as well as an analysis of how and under what circumstances urban design theory is formulated; Questioning how the idea of urban design may improve the physical character of the built-environment and why it is hoped that it will support improvement of the quality of life in cities and peri-urban areas; Conducting social and spatial analysis of the built environment; analyzing and criticizing the perceptual and performative aspects in urban design.

Syllabus:

Reviewing the understanding of urban design, including historical studies and discourses on what is meant by "good city" through the views

of theorists, as follows: cosmological beliefs, formalists, functionalists, picturesque, organics, utopians, livability, and ecological. Questioning the "performance dimension" in urban design theory and understanding the relationship between urban design and perceptual/visual/social dimensions. Once students are introduced to the theoretical view, then they will explore different ways of interpreting and understanding the urban environment. Discussing about how urban environments mean different things to different people, depending on their cultural, economic, racial and gender backgrounds. Brief reviewing the relationship between urban design activities and the political-economic context of the urban development process.

Preconditions: -

Textbooks:

1. R. Legates, The City Reader, 2nd ed, Routledge, 1999
2. Henri Pirenne, The Medieval Cities: Their Origins and the Revival of Trade, Princeton University Press, 1969
3. Aristoteles, The Politics (especially Book III and Book VII), Penguin Classics, revised edition, 1981

Property Workshop 1

ENAR800011

5 Credits

Objectives :

Studying the relationship between architecture and real estate activities in a small-scale project. Related to the space innovation for human activities such as new building types, lifestyles, market segmentation, and others.

Syllabus:

The dream & the product; the products (precedence): residential property, commercial/ retail property, office building/ property for working; money matters/ feasibility study; the products & the users/ lifestyle; management aspects of a property product; The proposed products (future): residential property, commercial/ retail property, office building/ property for working; finance & management.

Preconditions: -

Textbooks:



Property Workshop 2

ENAR800023

5 Credits

Objectives :

Studying the relationship between urban architecture and real estate activities in a large-scale project which is related to urban management, public and private sectors role in urban development, repositioning and revitalizing an area, and others.

Syllabus:

(1) Private sector/commercial development project, about 50 ha area development. Product property (physical rules that apply). Project funding & procurement scheme: e.g. mortgages. Rights and obligations of developers & local governments (developer: on site, off site, pay cash, etc. Local government: tax holidays, incentives, city facilities, etc.). Implementation plan (rights & obligations + development time schedule)

(2) Development of urban facilities related to property development (public-private development): Investigation/exploration of a public project through recovery opportunities by incorporating property development elements in it such as the development of educational areas /science center, MRT/busway/tollway associated with property development along its route. Procurement of city facilities and infrastructure.

Preconditions:

Completed Real Estate Workshop 1

Textbooks:

Adjusting to the offered topic.

Housing Policy

ENAR800038

3 Credits

Objectives :

Able to explore policy as a series of concepts that underlie the implementation of the housing sector in the country, including among others: understanding, objectives, characteristics, motives, scope, and implementation. Discusses housing policy and its relation to political, social, economic, cultural, and environmental aspects and practices towards implementation practices, including in the scope of architecture and the city.

Syllabus:

Indonesia as an archipelagic country: developing country, economic disparity and urban formation; Urbanization, migration: Indonesia demographic

characteristic; constitution of society; Housing demand & supply (formal & informal sectors); Politics of the state and housing policy: Typology of housing provision in Indonesia (legal aspect; mode of consumption; mode of production); Housing economy and finance; Land policy; Housing technology; Housing policy in Asian countries

Preconditions: -

Textbooks:

1. H Arendt, The Human Condition, The University of Chicago Press, 1958, pp. 7-17
2. M Heidegger tr by Albert Hofstadler, Kerper & Row, Poetry, Language, Thought, Publishing Inc., 1971, pp. 145-161
3. M Foucault, S. During (ed.), 'Space. Power and knowledge', The Cultural Studies Reader Second Edition, Routledge, 1999: 134-41
4. Henri Lefebvre translated by Donald Nicholson-Smith, The Production of Space, Blackwell, 1991, Chapter 1, pp. 26-52
5. P Bourdieu, Outline of A Theory of Practice, Cambridge University Press, 1977, pp. 72-95
6. M De Certeau tr by Steven F. Rendall, The Practice of Everyday Life, University of California Press, 1984, pp. 29-42 and 91-110
7. Kendig Hall, 'Housing Careers, Life Cycle and Residential Mobility : Implications for the Housing Market', Urban Studies, 1984, 21, 271-283
8. Michael Haan & Thomas Perks. 'The Housing Careers of Older Canadians: An Investigation Using Cycle 16 of the General Social Survey'. Canadian Studies in Population Vol. 35.2, 2008, pp. 223-242
9. K. D. Willis, Squatter Settlements, Elsevier Ltd, 2009
10. Brian Sullivan & Ke Chen. 'Design for Tenant Fitout: A Critical Review of Public Housing Flat Design in Hong Kong'. Habitat Intl. Vol 21. No 3, 1997, pp. 291-303
11. Leland Blank and Anthony Tarquin. Engineering Economy: Seventh Edition, McGraw Hills, 2012
12. B Harsman & J Quigley, Housing Markets & Housing Institutions in a Comparative Perspective". Housing Markets & Housing Institutions, Kluwer Academic, 1991, pp.1-29
13. Fashbir N Sidin, Housing Policy Systems in South and East Asia, Palgrave Macmillan, 2002, pp.161-176

14. John F.C Turner and Robert Fichter, Freedom to Build, Collier Mcmillan, 1972
15. John F.C Turner, Housing By People: Towards Autonomy in Building Environments, The Value of Housing, 1976, pp. 53-74.
16. A T Alamsyah, Menata pemukiman Pulau-Laut. Pidato Pengukuhan Guru Besar UI, 2008
17. Mayor Michael R Bloomberg and Amanda M.Burden, Coastal climate resilience, Urban waterfront adaptive strategies, Department of City Planning, 2013
18. A T Alamsyah, Regionalisme dalam Penataan Permukiman di Gugus Pulau Mikro, Disertasi, PSIL UI, 2006
19. Diposaptono, Subandono, Budiman, Hidup Akrab dengan Gempa dan Tsunami, Penerbit Buku Ilmiah Populer, 2008

Urban Housing and Settlement Theory

ENAR800016

3 Credits

Objectives :

Able to analyze the impact of housing development planning in urban areas.

Syllabus:

Housing problems in urban areas, study of typology and housing environment, construction methods and typology, economic studies and housing management, urban housing planning and design studies.

Preconditions: -

Textbooks:

1. Norma L. Newmark & Patricia J. Thompson, Self, Space and Shelter: An Introduction to Housing. New York: Harper and Row, Publisher, Inc. 1977
2. John F.C. Turner, Housing by People: Towards Autonomy in Building Environments, Marion Boyars Publishers Ltd, 1976
3. Graham Towers, At Home in The City: An Introduction to Urban Housing Design, 2005
4. Paul Bachin & Maureen Rhoden. Housing: The Essential Foundations, Routledge, New York 2003
5. Abidin Kusno, Politik Ekonomi Perumahan Rakyat dan Utopia Jakarta, 2012

Energy Efficient Building

ENAR800032

3 Credits

Objectives :

Students understand the theoretical principles of energy-efficient building and can apply them to design climate-responsive and energy-efficient buildings.

Syllabus:

Renewable energy, climate and sites, solar geometry, passive cooling, shading, natural & artificial light, and solar panels.

Preconditions: -

Textbooks:

1. Donal Watson, The Energy Design Handbook, The American Institute of Architecture Press, 1993
2. Klaus Daniels, The Technology of Ecological Building, English translation by Elizabeth Schwaiger, Birkhauser Verlag, Berlin 1994
3. Norbert Lechner, Heating Cooling Lighting, 2nd edition, translated, PT Raja Grafindo Persada, 2007

Architecture and Sustainability Workshop 1

ENAR800013

5 Credits

Objectives :

Students can develop and apply building technology theory in a small-scale design research project.

Syllabus:

Preconditions: -

Textbooks:

1. Dominique Gauzin-Muller, Sustainable Architecture and Urbanism, Birkhauser, 2002
2. Earl R. Babbie, The Practice of Social Research, Belmont: Wadsworth Publ. Co.Inc, 1973
3. Giancolli DC. General Physics, Prentice Hall Inc, 1984
4. James Ambrose, Simplified Design for Building Sound Control, John Wiley & Sons, 1995
5. Leslie L Doelle and Lea Prasetyo, Akustik Lingkungan, Erlangga, 1993
6. KE Watt, Understanding the Environment, UC Press, 1982
7. SFPE Handbook, Society of Fire Protection

Engineering.

Water Resources Management

ENCV800401

3 Credits

Objectives :

Students are able to work independently or work together in teams to carry out assessments (evaluating complex design processes or results) on various aspects of the scope of Water Resources Management in solving water resource problems and be able to present the results of the assessment in the form of systematic documents and able to communicate orally.

Syllabus:

Students are trained with the ability to understand:

1. Aspects of water resources management principles and policies (in Indonesia) and their developments;
2. Aspects and models of Integrated Water Resources Management (IWRM) both on a national and international scale;
3. Aspects of management based on government regulations and policies related to 3 (three) pillars of natural resource management, namely Utilization, Control of Water Damage, Conservation;
4. Supporting aspects of water resources management which include hydro-economy;
5. Natural resource management case (or project), selected in a Water Resources Management Area or river basin

Preconditions: -

Textbooks:

1. Regulation of the Minister of Public Works. Number: 11A/PRT/M/2006 about the Criteria and Determination of River Basin.
2. IWRM Resources. <http://www.gwp.org/en/The-Challenge/IWRM-Resources/>
3. GWP IWRM ToolBox: Useful Tool for Academia. [http://www.gwp.org/gwp-inaction/news-and-Activities/GWP-IWRM-ToolBox-A-useful-tool-for-academia-/](http://www.gwp.org/gwp-inaction/news-and-Activities/GWP-IWRM-ToolBox-A-useful-tool-for-academia/)
4. Mays, Larry W., 1996. Water Resources Handbook. McGraw-Hill. TEKNIK SIPIL PROGRAM MAGISTER 149
5. Loucks, Eric D., 1998. Water Resources and the Urban Environment. ASCE.

6. Several national, provincial, and regional regulations and policies related to Water Resources Management.

Watershed (DAS) Health Audit

ENCV803402

3 Credits

Objectives :

1. Able to apply a rapid assessment of the health of a watershed based on the Center for Watershed Protection method,
2. Able to categorize watershed health status based on impermeable land cover, water quality, and diversity of macrozoobenthos, and
3. Able to provide follow-up recommendations for improving watershed health.

Syllabus:

1. Land Use Planning,
2. Land Conservation,
3. Borders of Waters,
4. Ideal Tread Design,
5. Erosion & Sedimentation Control,
6. Rain Management,
7. Liquid Waste Management,
8. Stakeholder Concern.

Preconditions: -

Textbooks:

Environmental Audit

ENCV802105

3 Credits

Objectives :

Able to conduct audits and prepare environmental audit reports

Syllabus:

Definitions, principles, concepts and environmental policies in Environmental Auditing. Legal Basis for Environmental Audit Policies and Regulations. AL Basic Principles (Defining main issues and audit scope). Understanding ISO 1400: Improved Environmental Management and Sustainable Development. Review of the Environmental Management Plan and Environmental Management Plan. Basic Principles of Auditing (Basic principles, procedures, hierarchies and processes in environmental auditing). Types of Audits (Revenue audits, waste audits, process audits). Audit Method (procedure for determination,

weight, importance and valuation in environmental audit). Audit Documents. Audit Case Studies (case document studies).

Preconditions: -

Textbooks:

1. "Audit and Reduction Manual for Industrial Emissions and Wastes"; United Nations Environment Programme, Industry and Environment Office, United Nations Industrial Development Organization. ISBN: 92-807-1303-5
2. "Moving Ahead with ISO 14000", Improving Environmental Management and Advancing Sustainable Development; edited by: Philip A. Marcus & John T. Willig, Wiley Series in Environmental Quality Management John Wiley & Sons, Inc, 1997, ISBN 0-471-16877-7.
3. "Panduan Audit Sistem Manajemen Mutu dan/atau Lingkungan"; SNI 19-19011-2005. Badan Standardisasi Nasional

Life Cycle Analysis (LCA)

ENCV802202

3 Credits

Objectives :

Able to use a set of models to conduct an assessment of sustainable solid waste management.

Syllabus:

Overview Integrated Solid Waste Management, concept of sustainable solid waste management, IWMS (case studies and analysis) development, element of IWM, solid waste generation and composition, waste collection, central sorting, biological treatment, thermal treatment, landfilling, material recycling, model: STAN 2, Prognosis, and IWM 2.

Preconditions: -

Textbooks:

1. Integrated Solid Waste Management, George Tchobanoglous, Hilary Theisen, Samuel A. Vigil, McGraw Hill International Edition, 1993.
2. Handbook of Solid Waste Management, George Tchobanoglous, Frank Kreith, McGraw Hill, 2002.
3. Integrated Solid Waste Management: A Life Cycle Inventory, Forbes McDougall, Peter White, Marina Franke, Peter Hindle, Blackwell Science, 2001.

Infrastructure Asset Management

ENCV803602

3 Credits

Objectives :

1. Able to identify and analyze infrastructure asset management processes.
2. Able to explain infrastructure asset management and provide illustrations of asset management implementation on infrastructure to achieve sustainability in the infrastructure sectors.

Syllabus:

Infrastructure asset management, asset evaluation, asset valuation, optimization in asset management, asset allocation, risk management on infrastructure assets.

Preconditions: -

Textbooks:

1. Rice, M. R, DiMeo, R.A., Porter, M.P. (2012) Nonprofit Asset Management. John Wiley & Sons, Inc.
2. Schneeweis, T., Crowder, G. B., Kazemi, H. (2010) The New Science of Asset Allocation. John Wiley & Sons.

Transportation System

ENCV801502

3 Credits

Objectives :

Students can analyze the components of the transportation system from various dimensions, as well as the latest issues related to the Indonesian and global transportation systems; Students can design transportation systems that include operating, demand, and supply systems that meet the needs.

Syllabus:

Overview of the transportation system. Characterization and categorization of transportation systems for single mode and dual mode. Factors (influence) in the transportation system (planning, design, investment, operation, maintenance). Demand system (Sistem Permintaan). Supply System (Sistem Pasokan). Issues of equality, accessibility, environment, economy and disability.

Preconditions: -

Textbooks:

1. Grava, S., 2003. Urban Transportation System, McGraw-Hill.

2. Manheim, M., 1979. Fundamentals of Transportation Systems Analysis. Vol 1: Basic Concept 1st ed., The MIT Press.
3. Blunden, W. and Black, J., 1984. The Land-Use / Transport System 2nd ed., Pergamon-Press

Transportation Planning and Policy

ENCV802502

3 Credits

Objectives :

Able to bring out the uniqueness and originality of the proposal in creating the transportation policy.

Syllabus:

Transportation Policy Formulation; framework for assessing transport policy – land use, accessibility, air pollution, noise, accidents and sustainability. Transport planning and policy and interaction with spatial planning. Institutional arrangements for transportation planning and management. Risk, uncertainty and complexity in determining transportation policy. Transport policies at the local, regional, metropolitan and national levels; logistics transportation policy

Preconditions: -

Textbooks:

1. Schiller, P., Bruunm, E. and Kenworthy, J., 2010. An Introduction to Sustainable Transportation: Policy, Planning 1st ed., Routledge.
2. Morichi, S. and Acharya, S.R., 2013. Transport Development in Asian Megacities: A New Perspective, Springer.
3. Rodrigue, J.-P., Comtois, C. and Slack, B., 2009. The Geography of Transport Systems 3rd ed., Routledge.
4. Stopher, P. and Stanley, J., 2014. Introduction to Transport Policy: A Public Policy View, Edward Elgar Pub.

Logistics Transportation

ENCV803508

3 Credits

Objectives :

Able to bring out the uniqueness and originality of the proposal in creating the transportation policy

Syllabus:

Transportation Policy Formulation; framework for assessing transport policy – land use, accessibility, air pollution, noise, accidents and sustainability. Transport planning and policy and interaction with spatial planning. Institutional arrangements

for transportation planning and management. Risk, uncertainty and complexity in determining transportation policy. Transport policies at the local, regional, metropolitan and national levels; logistics transportation policy

Preconditions: -

Textbooks:

1. Schiller, P., Bruunm, E. and Kenworthy, J., 2010. An Introduction to Sustainable Transportation: Policy, Planning 1st ed., Routledge.
2. Morichi, S. and Acharya, S.R., 2013. Transport Development in Asian Megacities: A New Perspective, Springer.
3. Rodrigue, J.-P., Comtois, C. and Slack, B., 2009. The Geography of Transport Systems 3rd ed., Routledge.
4. Stopher, P. and Stanley, J., 2014. Introduction to Transport Policy: A Public Policy View, Edward Elgar Pub.

Project Investment and Finance

ENCV801601

3 Credits

Objectives :

Able to determine advanced concepts and appropriate principles to provide solutions to complex problems in the field of specialty in accordance with the practice of Civil Engineering (ELO 4 – Technical Specialization)

Syllabus:

Preconditions: -

Textbooks:

1. Leland Blank, Anthony Tarquin. Engineering Economy, 7th edition. McGraw Hill. 2012
2. Finnerty, John D. (2007). Project Financing: Asset-Based Financial Engineering. John Wiley & Sons, Inc., ISBN-13: 978-0-470-08624-7
3. Gatti, Stevano. (2008). Project Finance in Theory and Practice. Elsevier. Academic Press



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