DEPARTMENT OF INDUSTRIAL ENGINEERING
International Program
Acredited Unggul

ACADEMIC GUIDE BOOK
2022/2023

International Undergraduate Program in Industrial Engineering

"Go Beyond your imagination"

This academic guide book presents academic information. The Guide book provides thorough explanation of Curriculum 2021. The 2021 Curriculum is designed by referring to the Out-come-Based Education (OBE) and the program of Independent Learning – Independent Campus (MBKM), to nurture the graduates of Industrial Engineering with noble characters, grow as problem solver and innovative.

You can find complete information on the IUP IE Website
https://industrial.uii.ac.id/ip/

IUP IE UII

FACULTY OF INDUSTRIAL TECHNOLOGY

Vision

To be an excellent faculty that commits to Islamic values, professionalism, and global competition in education, research, community service, and Islamic dakwah/Dakwah Islamiyah by 2038.

Mission

1. To carry out the international-level education in technology
2. To carry out the international-qualified research in technology that is beneficial to science development as well as society
3. To perform the community service program that gives sustain benefits to society
4. To carry out Dakwah Islamiyah based on the exemplary role model of Rasulullah SAW
5. To nurture the collaboration in its objective to enhance the quality of Catur Dharma (Education, Research, Community Service and Dakwah Islamiyah)

Organization Culture

Organizational culture is established under the philosophy of FAST. FAST literally means “immediate” which also refers to dynamics definition. But above all, FAST is developed based on the prophetic characters, as follows:

- Fathonah (smart, competent and innovative)
- Amanah (impartiality, commitment)
- Shiddiq (honest, transparent and accountable)
- Tabliqh (communicative and open-minded)

ORGANIZATION STRUCTURE 2022 - 2026

Dean Office

Dean :
Prof. Dr. Ir. Hari Purnomo, M.T.

Vice Dean Resources Affair
Ahmad Munasir Raf'ie Pratama, S.T., M.I.T., Ph.D

Vice Dean Religion, Student and Alumni Affair
Arif Hidayat, Dr., S.T., M.T.

Department of Industrial Engineering

Head of Department
Dr. Drs. Imam Djati Widodo, M.Eng.Sc

Secretary of Department
Dr. Taufiq Immawan, ST., MM.

Undergraduate Program in Industrial Engineering

Head of Undergraduate Program
M. Ridwan Andi Purnomo, S.T., M.Sc. PhD.

Secretary of Undergraduate Program
Amarria Dila Sari, S.T., M.Sc.

Secretary of International Undergraduate Program
Ir. Ira Promasanti, Rachmadewi M.Eng

Magister Teknik Industri (MTI)

Head of Magister Program
Winda Nur Cahyo, S.T., M.T., Ph.d.

ORGANIZATION STRUCTURE 2022 - 2026

Head of Laboratory

Integrated Manufacturing System	: Abdullah 'Azzam, ST., MT.
Works System Design and Ergonomics	: Atyanti Dyah Prabaswari, ST., M.Sc.
Industrial Statistics and Optimization	: Annisa Uswatun K., S.T., M.BA., M.Sc
Modelling and Industrial Simulation	: Vembri Noor Helia, S.T., M.T.
Enterprise Resource Planning	: Danang Setiawan, ST., MT.
Innovation and Organizational Development	: Wahyudi Sutrisno, ST., MT., MM.

Head of Division

Academic Administration	:Edi Haryono
General Affairs	:Ervin Yulianita Indriyani, ST.
Financial	:Masirah, A.Md.
Information Technology	:Rahmat Miftahul Habib, S.Kom.

FACULTY UNITS

Management Information Systems

Management Information System in the Faculty of Industrial Technology provides services in information technology to support the performance of lecturers and students in the teaching-learning activities, such as:

1. Free-access internet service (UIIConnect) and Eduroam (Education Roaming UIIPrint.
2. a facility that enables all UII communities to print, scan and copy the documents, independently (do-by-yourself).
3. The guideline for using UIIPrint could be accessed at the itsupports.uii.ac.id. Voucher top-up could be performed by accessing print.uii.ac.id
4. Google Classroom and Google Apps for Education. All students are accommodated with the official UII email that could be accessed by gmail.uii.ac.id
5. Information System for Online Letter (Sistem Informasi Surat Online/SISO), which is an information system that was developed by the Faculty of Industrial Technology (FIT) to ease the letter administration. SISO can be accessed virtually by accessing the following address surat.fit.uii.ac.id
6. UII Gateway, which provides the students and the parents/guardians with easiness to get the academic information
7. The inquiries, feedback, and complaints related to IT services could be sent by following email: itsupport@uii.ac.id
8. Advertisement service or as means of socialization for announcements or events in the Faculty of Industrial Technology, the complete information can be accessed at https://fit.uii.ac.id/tv-hall/

FACULTY UNITS

Facilities

1. Health Service, Unisia Polifarma policlinic that serves 24-hours
2. Main Building, facilitated with proper facilities and infrastructure, such as classrooms, office complex, study center, auditorium, audio-visual, musholla/prayer room, hall, canteen, learning space, parks, blended-learning classroom, and co-working space
3. The Sport Facilities, which is with the soccer field, basketball court, volleyball court, and tennis court
4. Parking facilities that could accommodate 800 motorcycles and 150 cars to

Journals and Scientific Publication

1. TEKNOIN Journal of Faculty of Industrial Technology, which disseminates the issues related to Industrial Technology, It is registered under the serial number of p-ISSN 0853-8697 and e-ISSN 2655-6529, as well as SINTA indexed.
2. International Conference On Engineering And Technology For Sustainable Development (ICET4SD), which is an international seminar associated with the Industrial Technology field of expertise
3. Journal of Appropriate Technology for Community Services (JATTEC) that accumulates the outputs of activities in service and community empowerment, particularly in terms of appropriate technology.

Study Centers

It is established in the Faculty of Industrial Technology to support research topics in the industry that covers the fields of chemistry, electronics, mechanical, and informatics. Following are the existing study centers in the Faculty of Industrial Technology, UII:

1. Center of Jewellery Product Manufacturing Design Studies
2. Center for Business and Industrial Studies (PUSBIN)
3. Medical Informatics Study Center (PSIMED)
4. Center for Enterprise Information System Studies (SIE)
5. Center for Digital Forensics Studies (PUSFID)

Quality System Assurance

Quality System Controller is a faculty-level independent unit that represents the Board of Quality Assurance UII. This unit is established to support and supervise the faculty management in implementing UII quality standards that are interpreted through MERCY OF GOD, hence the service quality to consumers could be sustainably improved.

FACULTY UNITS

Students Facilities

FIT facilitates students with various student organizations, both curricular and extracurricular. These students' organizations are designated to accommodate them with alternative activities to actualize their talent and interest, as a medium to train their organizational skills, managerial and their ability to work in a team and society. The students' organizations that developed by FIT are Board of Students' Representative (DPM), Students' Executive Body (LEM), Community of The Industrial Engineering Students, Community of International Students, Students Press, Rukun Rencang Community, Djemuran Theatre, Takmir of Bahrul Ullum, Students' Cooperative, and Saman Dance of Industrial Engineering. Most of all students' activities could be accessed by this link https://kemahasiswaan.uii.ac.id/informasi/organisasi-kemahasiswaan/.

Below are study clubs that are accommodated by FIT, as follows:

- Entrepreneur Club (Laboratory of Innovation and Organizational Design)
- Ergo Club (Laboratory of Work System Design and Ergonomics)
- Industrial Research Club
- Linux Study Club
- Delphi Study Club
- English Debating Society
- AutoCAD Study Club
- Telecommunication Club

Students' organizations, study clubs, and other students' units work synergistically to design and present students-based activities. Those activities, such as scientific activities objected to improving insights and power of reasoning, which are seminars, panel discussion, training on science and technology, religion, politics, and culture as well as entertainment-based activities, such as sports and art.

CREDIT SYSTEM FOR HIGHER EDUCATION

Definition of Credit System

Currently, universities in Indonesia adopt a credit system in running their academic activities. Students are allowed to determine their subjects that are limited and measured based on preceding semester performance. Specifically, for first-semester students, subjects are offered in a bundle that has been determined by the undergraduate program based on the existing curriculum. Study assessment is indicated by a certain measurement called GPA (Grade Point Average). While each subject has its weight that is interpreted as credit (Semester Credit Unit/Satuan Kredit Semester (SKS)). Following semester weight allocation is determined by the score of GPA on the preceding semester.

GPA of Previous Semester	Maximum Weight of Credits
IP < 1,50	12 Credits
1,50 ≤ IP < 2,00	15 Credits
2,00 ≤ IP < 2,50	18 Credits
2,50 ≤ IP < 3,00	21 Credits
IP ≥ 3,00	24 Credits

Semester credit unit/SKS of a subject is related to a learning activity that should be accomplished by students in a week, in which 1 (one) credit is equal to:

1. One-credit learning method in the process of lecture, laboratory exam or tutorial that consist of:
   - 50 minutes class activity per week per semester
   - 60 minutes of structured assignment per week per semester
   - 60 minutes of subject-related independent study per week per semester
2. One-credit learning method in the process of laboratory works, studio, workshop, fieldwork, research, designing, conscription, student exchange, internship, entrepreneurship, and/or community service, 170 (one-hundred and seventy) minutes per week per semester.

CREDIT SYSTEM FOR HIGHER EDUCATION

Course and Exams

Courses are held based on the specific schedule. Students might select courses independently during the course registration period ("key-in" period) that is generally carried out in the early semester.

Every student must participate in at least 75% of the total meetings of each subject. Later, the study evaluation is performed based on the course learning outcomes (CLO). The assessment of CLO is supported with the assignment/ quiz/project/exam or other models included in the Semester Study Plan (RPS). A scheduled examination is carried out 3 times for each semester, as follows:

- Mid Exam
- Final Exam
- Remedial Exam

Important Notes:

1. Each type of exam for a subject is only conducted once as stated in the official schedule released by Faculty, ***No make-up exam is allowed in any form***.
2. The condition for participating Final Exam is the minimum 75% attendance of total sessions, it also applies for supplementary exam/remedial exam

The Calculation of GPA

Students' GPA is determined by the credits' weight of the subject and the grade of each subject taken. Later, the grade is stated in the letter format under a certain weight, as illustrated in the table below.

Notes :
Minimal passing grade is C

Grade	Weight
A	4,00
A-	3,75
A/B	3,50
B+	3,25
B	3,00
B-	2,75
B/C	2,50
C+	2,25
C	2,00
C-	1,75
C/D	1,50
D+	1,25
D	1,00
E	0

CREDIT SYSTEM FOR HIGHER EDUCATION

Grading Systems

International Undergraduate Program in Industrial Engineering will set its grading system so that all IUP IE lecturers will have same standard in giving grades to the students. The grading system proposed by IUP IE is as follows:

No	Letter Grade	Grade Distribution			
1	A	≥ 75			
2	A -	72.5	≤	N	< 75
3	A/B	70	≤	N	< 72.5
4	B +	67.5	≤	N	< 70
5	B	65	≤	N	< 67.5
6	B -	62.5	≤	N	< 65
7	B/C	60	≤	N	< 62.5
8	C +	57.5	≤	N	< 60
9	C	55	≤	N	< 57.5
10	D (Fail)	< 55			

The Calculation of GPA follows the below formula

$$GPA = \frac{\sum\{(Credits\ of\ Subject)x(Weight\ of\ Grade)\}}{\sum(Credits\ of\ Subject(s))}$$

Note:
Once a student has accomplished entire subjects, the score will be called Grade Point Average (GPA)

The classification for students' achievement based on GPA is notified by the following remarks:

- GPA 2.76 - 3,00 is rewarded with **Satisfying** predicate
- GPA 3.01 – 3.50 is rewarded with **Very Satisfying** predicate
- GPA 3.51 – 4.00 is rewarded with **Cumlaude** predicate

ACADEMIC STATUS

Academic Status

1. Active, the students who have filled out the online semester plan card after settling the fixed tuition fee (first installment for the odd term and the third installment for The even term). The students are registered in the current semester and are allowed to join the academic activities as well as given access to administrative and academic services
2. Non-Active, the students who are inactive at a certain semester, without rector permission. Hence, they are unable to join the academic activities. The outstanding fixed tuition fee will be incurred once the students propose their status activation, and only 12 credits are allowed to be taken.
3. Academic Leave, the students who are unregistered at a certain semester under official permission from the rector. The students are unable to attend the academic activities and are dismissed from the obligation to pay the tuition fee. Once they propose the activation, the numbers of credits taken are restored as the allocation of the latest semester, before taking the academic leave. Academic leave can be taken by the students who have actively accomplished 2 (two) semesters in the first year of study. The academic leave should be proposed per semester for a maximum of 4 semesters in total, consecutively or separately.
4. Suspension, which is addressed to the students who violate the disciplinary regulation that leads to restriction to join the academic activities in a certain period.
5. Drop-out, if the students fail in the Mid-Study Evaluation and/or End of Study Evaluation
   - First-2-semesters evaluation, if the total credits accomplished equal to 0 credit
   - First-4-semesters evaluation, if the total credits accomplished < 40 credits with GPA < 2,25
   - End-of-study Evaluation, if the study exceeded 14 semesters or equal to 7 years, including academic leave permitted by UII
6. Graduated, by complying with the completion standard, as follows:
   - Having accomplished 144 credits with a minimum GPA of 2.25
   - Having accomplished the weight of participation credits (SKP) for Diploma Companion Certificate (SKPI)
   - A minimum score of C for all courses
   - English proficiency of CEPT minimum for regular students 425 (or as regulated by the university) and 670 for IUP IE student or other equivalent english proficinecy scores.
7. Other academic statuses could be accessed at the following link https://academic.uii.ac.id/new/2018/01/01/jenis-jenis-status-mahasiswa/

UNDERGRADUATE PROGRAM

Vision

To be internationally acknowledged as an undergraduate program, which is qualified, excellent, and innovative in developing the knowledge of Industrial Engineering based on Islamic values.

Mission

1. To organize a qualified and excellent education that is oriented to stakeholders' requirements.
2. To conduct creative, innovative, and sustainable research, in terms of science and technology development.
3. To perform community service in its efforts to apply beneficial science and technology to society.
4. To perform dakwah Islamiyah that oriented to akhlakul karimah by accentuating it to good exemplary.

The undergraduate Program in Industrial Engineering was established in 1982, and until recently it still holds A accreditation issued by the National Accreditation Board for Higher Education. Continuous improvement in maintaining learning quality is kept on promoted to achieve international acknowledgment. The intention is finally manifested with the ASEAN University Network-Quality Assurance (AUNQA) Standard certificate of achievement that is valid from 2019 – 2024. The curriculum is referred to provide students with the ability of productivity improvement in Supply Chain Management, which is built upon the recent revolution trend, industry 4.0

During lectures, students are accommodated with four concentrations, which are Operational Research, Production Engineering, Ergonomics, and Industrial Management. Aside from the regular undergraduate program, the Department of Industrial Engineering also accommodates students with International Program (IP), which uses English as the main language for entire academic activities. Other programs are also formulated to enhance students' competence, such as student exchange, the internship, Independent Learning-Independent Campus Program (MBKM), international visiting lecturers, expert lectures, industrial research club, coaching clinic, and expert-level certification.

Recently, graduates of Industrial Engineering have reached thousands of alumni that have gathered under a community called The Association of Industrial Engineering Alumni (IKATI). The existence of IKATI has opened the wider opportunities in career networking in various multinational companies, such as Pertamina, Angkasa Pura, Pupuk Kalimantan Timur, Perusahaan Gas Negara, GMF Aerospace, Institut Teknologi Bandung, Bank Syariah Mandiri, Inti Ganda Perdana, PT. Perusahaan Listrik Negara, PAMA Persada, POS Logistik, as well as career as the entrepreneur.

UNDERGRADUATE PROGRAM

International Program

FIT UII has initiated the establishment of the International Program in 1999. It accommodates students with lectures and entire academic activities, which apply English as the main language. Until recently, FIT only offers Industrial Engineering as a department with International Program.

International Program focuses on the implementation and development of Industrial technology with the support of proper information technology. In which, the rapid development of information technology has altered the business environment to the global stage. Organization management and a more distributed production system need integrated planning and control to create a working flow that is smooth, effective, and efficient. The subjects and syllabus are continuously being adjusted with the latest trend of technology development to anticipate a dynamic change in the business environment.

International collaboration with overseas institutions becomes an inseparable part of the improvement that must be constantly maintained to establish a good education network, to assist the students to be long-life learners with excellent insights. It is expected that students could continue their education in designated universities, which already collaborated with FIT UII, without considering to re-take the same accomplished subjects.

The dual degree program, student exchange, twin class, research, instructor exchange, international lecture series, postgraduate program collaboration, international internship, cultural immersion, and other forms of collaboration will be improved both in quantity and quality. In the meantime, several collaborations with reputable universities in Indonesia and overseas have been executed and initiated.

UNDERGRADUATE PROGRAM

Laboratories

1. Laboratory of Integrated Manufacturing System
This laboratory provides students with skill and specialization in production planning and control as well as production floor management. The activities include designing the product, producing, product assembling, calculating the inventory and numbers of workers, scheduling, performing product control. and others, with the support of computerization and augmented reality.

2. Laboratory of Work System Design and Ergonomics
This laboratory provides students with skill and specialization on the concept implementation of work system design application in order to achieve certain productivity levels, ergonomics, and related aspects, particularly physiological, and environmental aspects.

3. Laboratory of Industrial Statistics and Optimization
This laboratory provides students with skill and specialization in utilizing various types of statistical models and methods to solve problems in the industry. It also accommodates students with specialization in problem-solving by employing several types of optimization, mathematical model, and data science.

4. Laboratory of Modelling and Industrial Simulation
This laboratory provides students with skill and specialization in simulating industrial systems, service, and business management. Entire laboratory works are performed with the support of computers. Two mechanisms of laboratory works are system analysis and industrial games.

5. Laboratory of Enterprise Resource Planning (ERP)
This laboratory provides students with skill and specialization in Enterprise Resource Planning, in which the system is applied by most companies all over the world. This laboratory accommodates students with international certification that is acknowledged worldwide.

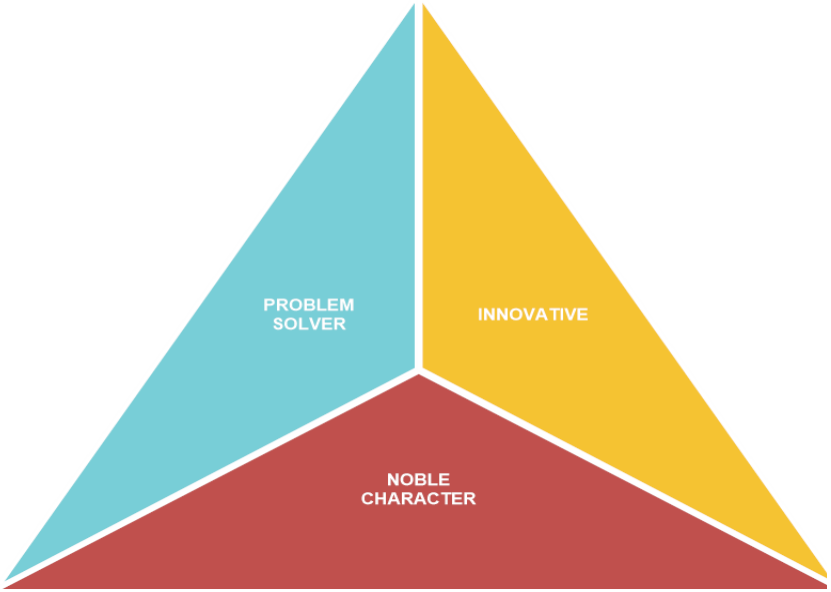
6. Laboratory of Innovation and Organizational Development
This laboratory provides students with skill and specialization in industrial system innovation and management, such as organizational development and enterprise's design

GRADUATE PROFILES

NOBEL CHARACTERS, PROBLEM SOLVER, INNOVATIVE

Broad Professional Roles

The Graduates of Undergraduate Program in Industrial Engineering play their role in many positions/first job positions, as follows:
Production Analyst, Product Engineer, Health Safety and Environment Engineer, Logistic Specialist, Human Capital Analyst, Cost Control Engineer, Maintenance Engineer, Quality Engineer, Marketing and Sales Engineer, Lean-Manufacturing Excellence Engineer, Data and Information Analyst, Assistant Project Manager, Academics, Supply Chain Officer, Entrepreneur, Business Analyst and Consultant.

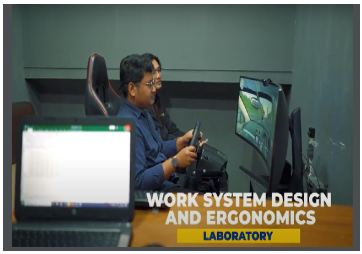


STRONG CHARACTERS

PROFESIONAL TALENTS

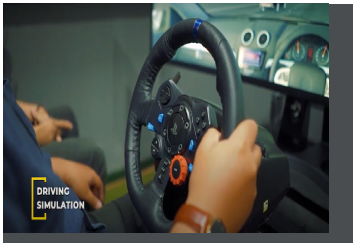
NOBLE CHARACTERS

The spiritual ability encourages the graduates in practicing the Islamic-based attitude and behavior, such as truthful, trustworthy and well-mannered. Those qualities are expected to help them in providing the positive contribution to the institution, society and environment, in its correlation to national growth and scientific development, which are acknowledged internationally.



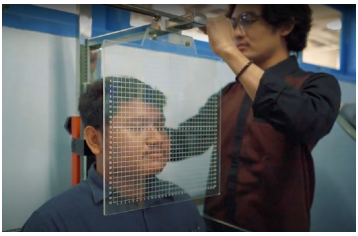
PROBLEM SOLVER

Capable to identify the problems in industrial system and able to provide comprehensive alternative solution.



INNOVATIVE

Capable to actualize the insights, imagination and various stimulants in design, installation, and integral system improvement.



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GRADUATE LEARNING OUTCOMES

To maintain various roles as stated in the profile, following are the graduate's learning outcomes (GLO) for Undergraduate Program in Industrial Engineering that are categorized in 4 aspects :

The Aspect of Attitude

LO1 : Able to express the attitude of devotion towards One True Almighty God, by applying the sharia in daily life and upholding the universal Islamic ethics (TAQWA)

LO5 : To have the Islamic-value-based Entrepreneurship character (ENTREPRENEURSHIP)

The Aspect of Knowledge

LO2 : Able to apply natural, mathematical, and social sciences to acquire a comprehensive engineering-principle understanding (BASIC SCIENCE & ENGINEERING)

The Aspect of General Skill

LO6 : Able to identify, formulate problems, design and conduct appropriate experiment, process, analyze and interpret data, and solve engineering problems (DATA ANALYSIS)

LO7 : Able to manage teams and organizations and deliver ideas in a global environment (TEAMWORK)

LO8 : Becoming an ethical, adaptable, and lifelong-learner professional (LONG LIFE LEARNING)

The Aspect of Special Skill

LO3 : Able to design and implement modern engineering tools, methods, and skills to elevate information-technology-based integrated systems performance (MODERN ENGINEERING TOOLS & INFORMATION TECHNOLOGY)

LO4 : Able to evaluate integrated system governance particularly in Supply Chain (SUPPLY CHAIN)

STRUCTURE OF CURRICULUM

INTERNATIONAL CERTIFICATION
AUN-QA

✓ 144 credits

The Curriculum of Undergraduate Program in Industrial Engineering UII covers 144 credits, in which 9 of them are grouped as elective courses and the other 135 credits are classified as mandatory, with the following distribution:

✓ 9 credits as elective courses

Industrial Management, Operational Research, Production Systems, Ergonomic, FastTrack Program, Internshop, and Business Startup.

✓ 135 credits as mandatory courses

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✓ Innovative Curriculum

The 2021 Curriculum is designed by referring to the Outcome-Based Education (OBE) and the program of Independent Learning – Independent Campus (MBKM), to nurture the graduates of Industrial Engineering with noble characters, grow as problem solver and innovative.

Semester 1

Code	Course	Credits	Subject Group	Prerequisite(s) (D)
UNI600	Islamic Religion	2	MPK	-
STI101	Calculus 1	3	MKK	-
STI102	Physics	2	MKK	-
STI103	Introduction to Industrial Engineering	3	MKK	-
STI104	Programming Logic	3	MKK	-
STI105	Fundamental of Industrial Engineering Design	3	MKK	-
STI106	Linear Algebra	2	MKK	-
STI107	Biology: Anatomy and Physiology	2	MKK	
	Total Credits	20		

Semester 2

Code	Course	Credits	Subject Group	Prerequisite(s) (D)
UNI601	Islam Ulil Albab	3	MPK	Islamic Religion
UNI603	Pancasila	2	MPK	-
UNI607	Scientific Writing	2	MPK	
STI201	Calculus 2	3	MKK	Calculus 1
STI202	Electromagnetism	2	MKK	Physics
STI203	Statistics 1	2	MKK	-
STI204	Mechanics	2	MKK	Physics
STI205	Introduction to Economics	2	MKK	-
STI206	Materials Chemistry	2	MKK	-
	Total Credits	20		

STRUCTURE OF CURRICULUM

Semester 3

Code	Course	Credits	Subject Group	Prerequisite(s) (D)
UNI606	English	2	MPK	-
STI301	Work Method and Measurement	2	MKB	Mechanics
STI302	Manufacturing Process	3	MKK	Introduction to Industrial Engineering
STI303	Optimization	3	MKK	Linear Algebra
STI304	Statistics 2	3	MKK	Statistics 1
STI305	Cost Analysis and Estimation	2	MKK	Introduction to Economics
STI306	Production Planning and Control 1	2	MKB	Introduction to Industrial Engineering
STI307	Physics Laboratory Works	1	MKK	Physics
STI308	Environmental Chemistry	2	MKK	-
	Total Credits	20		

Semester 4

Code	Course	Credits	Subject Group	Prerequisite(s) (D)
STI401	Stochastic Model	3	MKK	-
STI402	Engineering Economics	2	MKK	Cost Analysis and Estimation
STI403	Work System Design & Ergonomics	3	MKB	Work Method and Measurement
STI404	Database Management System	3	MKK	Programming Logic
STI405	Quality Control and Assurance	3	MKK	Statistics 2
STI406	System Modelling	2	MKB	Optimization
STI407	Production Planning and Control 2	2	MKB	Production Planning and Control 1
STI408	Industrial Psychology	2	MPK	-
	Total Credits	20		

Semester 5

Code	Course	Credits	Subject Group	Prerequisite(s) (D)
UNI605	Sharia Entrepreneurship	2	MKB	-
STI501	Decision Analysis & Data Mining	3	MKB	Optimization
STI502	Occupational Safety and Health (OSH)	2	MKB	Environmental Chemistry
STI503	Productivity Engineering	2	MKB	Quality Control and Assurance
STI504	Intelligent System	2	MKB	Optimization
STI505	Industrial Organization Design	2	MKB	Industrial Psychology
STI506	Project Management	2	MKB	Engineering Economics
STI507	Product Design	3	MKB	Work System Design & Ergonomics
STI508	Management Information System	2	MKB	Database Management System
	Total Credits	20		

STRUCTURE OF CURRICULUM

Semester 6

Code	Course	Credits	Subject Group	Prerequisite(s) (D)
STI601	Facility Layout Design	3	MKB	Production Planning and Control 1
STI602	Enterprise Resource Planning	3	MKB	Production Planning and Control 1
STI603	Enterprise Analysis and Design	3	MKB	Engineering Economics
STI604	Integrated Industrial System Design	3	MKB	Production Planning and Control 2
STI605	Computer Simulation	3	MKB	System Modeling
STI606	Basic Research Methodology	2	MKK	Scientific Writing
STI607	Supply Chain Management	3	MKB	Production Planning and Control 1
	Total Credits	20		

Semester 7

Code	Course	Credits	Subject Group	Prerequisite(s) (D)
UNI602	Islam Rahmatan lil Alamin	3	MPK	
UNI604	Civic Education	2	MKU	-
UNI608	Community Service	2	MBB	>100 credits, GPA>2.25
STI9XX	Elective Course 1	3	MKB	
STI9XX	Elective Course 2	3	MKB	-
STI9XX	Elective Course 3	3	MKB	
	Total Credits	16		

Semester 8

Code	Course	Credits	Subject Group	Prerequisite(s) (D)
STI801	Undergraduate Thesis	5	MKB	Basic Research Methodology, 1 Elective Course, have taken or taking an internship, > 120 credits
STI802	Internship	3	MBB	> 100 credits, Student soft skills development
	Total Credits	8		

STRUCTURE OF CURRICULUM

ELECTIVE COURSES

Elective Courses
Field of Interest: Industrial Management

Code	Course	Credits	Subject Group	Prerequisite(s) (D)
STI901	Human Capital Management	3	MKB	Industrial Psychology
STI902	Strategic Management	3	MKB	Industrial Organization Design
STI903	Knowledge Management	3	MKB	Management Information System
STI904	Technology Management	3	MKB	Production Planning and Control 1
STI905	Risk Management	3	MKB	Engineering Economics
STI906	Financial Engineering	3	MKB	Engineering Economics
STI907	Asset Management	3	MKB	Production Planning and Control 1
STI908	Service Management	3	MKB	Quality Control and Assurance
STI909	Decision Support System	3	MKB	Management Information System
STI910	Industrial Marketing	3	MKB	Cost Analysis and Estimation
STI911	Analysis and Design in MIS	3	MKB	Database Management System
STI912	Business Process Management	3	MKB	Enterprise Resource Planning
STI913	Business Process Integration	3	MKB	Enterprise Resource Planning

Field of Interest: Operational Research

Code	Course	Credits	Subject Group	Prerequisite(s) (D)
STI914	Six Sigma	3	MKB	Quality Control and Assurance
STI915	Multivariate Analysis	3	MKB	Statistics 2
STI916	Advanced Simulation	3	MKB	Computer Simulation
STI917	Data Science	3	MKB	Decision Analysis & Data Mining
STI918	Quality Engineering	3	MKB	Quality Control and Assurance
STI919	Business Intelligence	3	MKB	Decision Analysis & Data Mining
STI950	Metaheuristic	3	MKB	Stochastic Model

STRUCTURE OF CURRICULUM

ELECTIVE COURSES

Field of Interest: Production System

Code	Course	Credits	Subject Group	Prerequisite(s) (D)
STI921	Advanced Automation	3	MKB	Programming Logic, Production Planning and Control 2
STI922	Lean and Green Manufacturing	3	MKB	Production Planning and Control 2
STI923	Halal Supply Chain Management	3	MKB	Supply Chain Management
STI924	Intelligent Manufacturing System	3	MKB	Production Planning and Control 2
STI925	Maintenance Management	3	MKB	Production Planning and Control 2
STI926	Humanitarian Logistics	3	MKB	Supply Chain Management
STI927	TRIZ for Product Design	3	MKB	Product Design
STI928	Logistics Management	3	MKB	Production Planning and Control 2
STI929	SCM Performance Management	3	MKB	Supply Chain Management

Field of Interest: Ergonomics

Code	Course	Credits	Subject Group	Prerequisite(s) (D)
STI930	Human-Computer Interaction	3	MKB	Work System Design & Ergonomics
STI931	Human-Machine System	3	MKB	Work System Design & Ergonomics
STI932	Industrial Ergonomics	3	MKB	Work System Design & Ergonomics
STI933	Environmental Ergonomics	3	MKB	Environmental Chemistry, Work System Design & Ergonomics
STI934	Ergonomic Design for Special Purpose	3	MKB	Work System Design & Ergonomics, Product Design
STI935	Cognitive Ergonomic	3	MKB	Work System Design & Ergonomics
STI936	Macro Ergonomic	3	MKB	Work System Design & Ergonomics
STI937	Environmental Occupational Health and Safety	3	MKB	Occupational Safety and Health (OSH)
STI938	Transport safety	3	MKB	Occupational Safety and Health (OSH)

STRUCTURE OF CURRICULUM

ELECTIVE COURSES

Elective Courses for Special Topics

Code	Course	Credits	Subject Group	Prerequisite(s) (D)
STI939	Special Topics in Industrial Management	3	MKB	
STI940	Special Topics in Operational Research	3	MKB	
STI941	Special Topics in Production System	3	MKB	
STI942	Special Topics in Ergonomics	3	MKB	

Mandatory Elective Courses for FAST TRACK PROGRAM

Code	Course	Credits	Subject Group	Prerequisite(s) (D)
STI943	Operations Research	3	MKB	
STI944	Production System	3	MKB	
STI945	Advanced System Modelling	3	MKB	
STI946	The Philosophy of Industrial Engineering	3	MKB	

Elective Course for Internship

Code	Course	Credits	Subject Group	Prerequisite(s) (D)
STI947	Capita Selecta	3	MKB	
STI948	Industrial System Analysis	9	MKB	

Elective Course for Business Startup

Code	Course	Credits	Subject Group	Prerequisite(s) (D)
STI949	Technopreneurship	9	MKB	

REGULAR COURSE PATH

CURRICULUM MAP

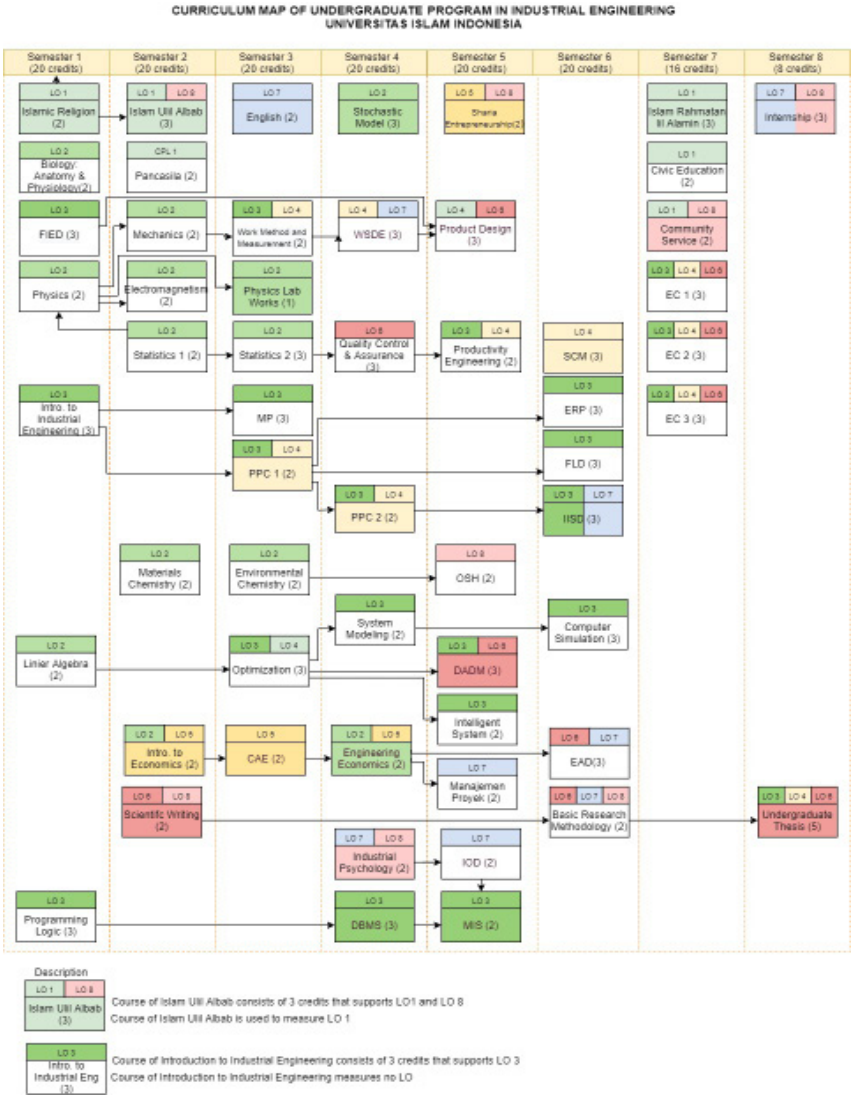


Figure 1. Ragular Course Path

MANDATORY ACTIVITES

DIPLOMA COMPANION CERTIFICATE

Several activities are facilitated to support graduates' profiles. Those activities will be documented in the Diploma Companion Certificate (**SKPI/Surat Keterangan Pendamping Ijazah**). The table below describes the activity's detail and weight of participation credits (SKP/Satuan Kredit Partisipasi)

Code	Title of Activities	Title of Activities (In Indonesian)	Method of Learning	Weight of SKP
UNI660	Islamic Basic Values Training	*Pendalaman Niai Dasar Islam*	Boarding Program and sustainable *taklim*	20 SKP
UNI661	Qur'anic Personal Development Training	*Pengembangan Diri Qurani*	Boarding Program and sustainable *taklim*	20 SKP
UNI662	Career and Self-Development Training	*Pelatihan Pengembangan Diri*	Boarding Program	5 SKP
UNI663	Islamic Leadership and Da'wa Training	*Pelatihan Kepemimpinan dan Dakwah*	Boarding Program	5 SKP
	Student Soft skills Development	*Student Softs kills Development*	Soft Skills Training	1 SKP
		Form/type/example of the activities are stated in the PR UII No.24 of 2019		9 SKP

ACCELERATION & FAST TRACK S1-S2

IUP IE UII + University of Gloucestershire /UoG (UK) and MTI UII + NTUST (Taiwan)

ACCELERATION PROGRAM

The curriculum accommodates the students in completing the bachelor degree in 7 semesters or 3,5 years. The consideration of the acceleration program is based on Permendikbud RI No. 3 of 2020, to provide opportunities for students with high achievement. After accomplishing the first two semesters, they are allowed to register for a maximum of 24 credits per semester. The acceleration could be initiated by students in the third semester.

FAST TRACK S1-S2 MTI UII - NTUST (TAIWAN)

The curriculum accommodates the students who would like to accomplish both bachelor and master program in 5 years. This program is offered in the collaboration with Master Program in Industrial Engineering UII. The preparation of the program should be initiated from the fifth semester of study, with the specific courses' recommendations as described by Figure 3. The students must register for the program no later than the early sixth semester, by fulfilling the following requirements:

FAST TRACK S1-S2 REQUIREMENTS

* Students have to conduct the course registration (key-in) in semester 3 or 5 by complying with the fast-track path, as suggested by the undergraduate program.
* Students must enroll for the fast-track program maximum in the sixth semester (if the quota is still available).
* It is mandatory for the students to register for recommended elective courses for the fast-track program in the 7th semester, as suggested by the undergraduate program and lecturers of the master program.
* A Minimum GPA of 3.0
* The undergraduate thesis supervisor must be a lecturer with minimum qualification of Doctoral Degree Lector, while the defense's examiners must be the lecturers with the minimum title of Doctoral Degree.
* The study must be completed and posted before the 8th semester ends.

YOU'RE ACCEPTED

Later, the fast-track program will be started in the 7th semester by selecting four mandatory elective courses assigned for the fast-track program. It takes 147 credits to accomplish the program. In case of failure in the program selection (in the 6th semester), this path could be adjusted for passing the bachelor degree in 3,5 years, by shifting four mandatory elective courses designed for fast-track to three elective courses on the regular path

ACCELERATION PATH

CURRICULUM MAP

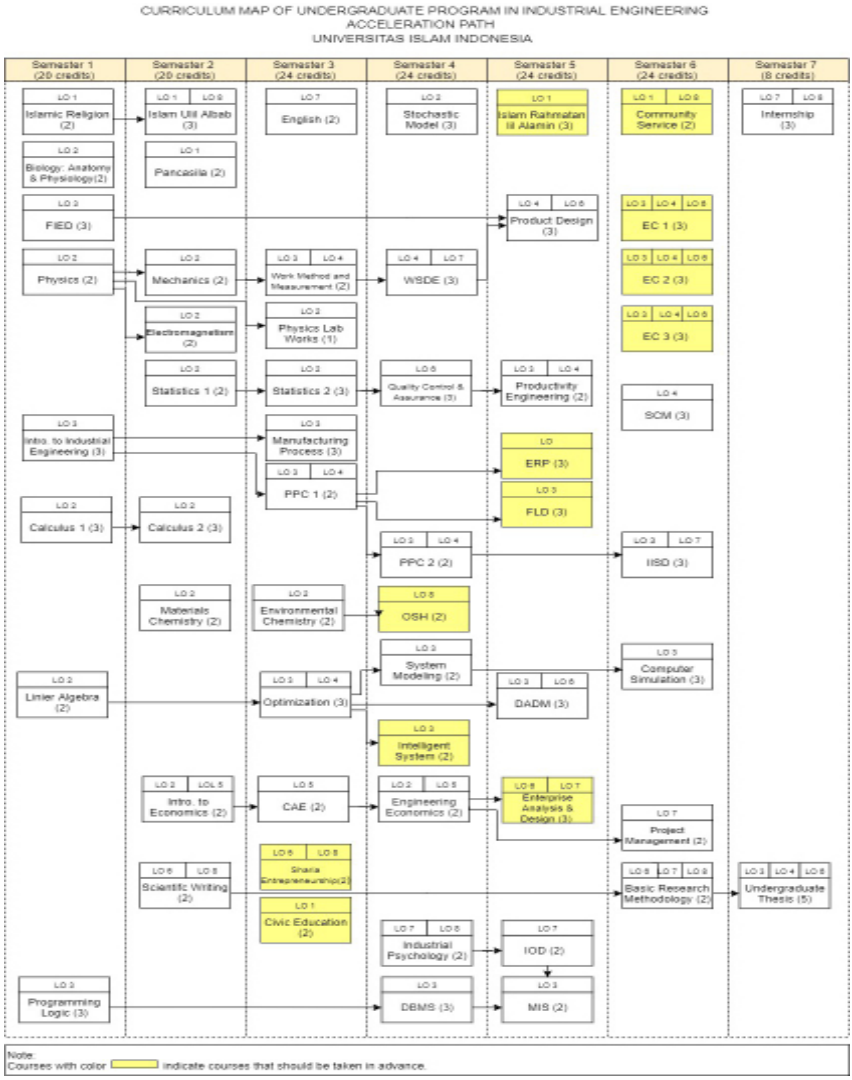


Figure 2. Acceleration Program Course Path

DOUBLE DEGREE PROGRAM (DD) & FAST TRACK S1-S2 IUP IE UII & UoG UK

scan me

ST & B.Eng (DD S1) or ST, B.Eng & M.Eng (S1-S2)

IP Students who have successfully completed the first two years of Bachelor Industrial Engineering program will be considered for admission onto the University of Gloucestershire awards :

- ***Industrial Control Engineering (BEng & Meng)*** or
- ***Mechatronics Engineering (BEng & Meng)***

Eligibility

International Mobility

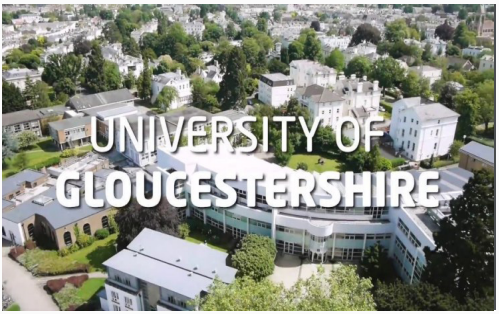
International Program students should demonstrate and must provide evidence that they have attained a level of English equivalent to **IELTS 6.0 overall (with a minimum of 5.5 in each component).** Alternative acceptable English Language qualifications can be found at ***www. glos.ac.uk/international.***

Source: https://studyabroad.shiksha.com/uk/universities/university-of-gloucestershire#pop-upOpen

Direct Entry

International Mobility

Students who have completed the designated course(s) and who have met the requirements detailed above may be considered by the University of Gloucestershire for entry into **level 5** of the following programmes:
· **Industrial Control Engineering** (B.Eng & M.Eng)
· **Mechatronics Engineering** (B.Eng & M.Eng)



Source : https://konsultanpendidikan.com/2019/05/02/gambaran-singkat-kuliah-di-university-of-gloucestershire/

Great Future

Curriculum Mapping

Calculus 1&2, Linear Algebra (Matrix&Vector), Calculus 2, Mechanic (Engineering Mechanics) , Introduction to Industrial Engineering, Physic 1&2, Physic Lab, Programming Logic, Intelligent Systems, Computer Simulation, Product Design, System Modeling, Fundamental of Industrial Engineering Design, Materials Chemistry, English, Scientific Writing.

STUDENT EXCHANGE / DOUBLE DEGREE

Term of Distance Learning

The curriculum accommodates the students for accomplishing the bachelor degree by joining the Independent Learning-Independent Campus Program (MBKM/Merdeka Belajar Kampus Merdeka) with three schemes.
The three schemes available for students who would like to participate in Student Exchange/ Double Degree program, as illustrated in Figure 4, with the following programs :
1. inter-undergraduate programs in UII through university's mandatory courses,
2. similar/equivalent undergraduate programs in industrial engineering from different universities both national and international, based on the existing MOU/MOA in the University/ Faculty/Department, and
3. from different universities, based on the existing MOU/MOA in the University/Faculty/Department.

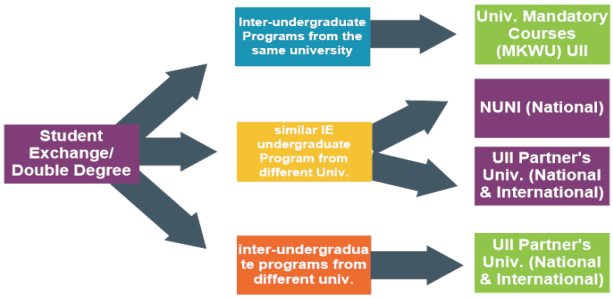


Figure 4. Student Exchange/Double Degree Program Schemes of MBKM

Eligibility

Due to the implementation, it should be ensured that the curriculum of the assigned university supports the competence of the program and grants approval from the undergraduate program in Industrial Engineering through the existence of MOU/MOA. The course will be converted based on the adjustment of the relevant semester plan (RPS) of a subject. This type of path could be implemented in the 5th semester, yet it is highly suggested to be initiated in the 7th semester, under the following conditions:

1. Students have attained a minimum GPA of 3.0, have accomplished 80 credits. The designated undergraduate program must hold the same grade of accreditation. Particularly for International Program students, they are recommended to select the program, which also runs the international class.
2. The program will be converted to a relevant-weight course, as stated in the current curriculum of the Undergraduate Program in Industrial Engineering. Due to the absence of a relevant-weight course, later it will be converted to an elective course of Special Topics.
3. Students must register the program to Study Plan, so the result of the program is visible for the conversion process.
4. For system approval, the students must consult to Academic Advisor and Head of Undergraduate Program in Industrial Engineering related to the Independent Learning Program by electronic mail (e-mail)
5. Additional conditions apply, based on the policy of the partner university

FAST TRACK S1-S2 PATH

CURRICULUM MAP

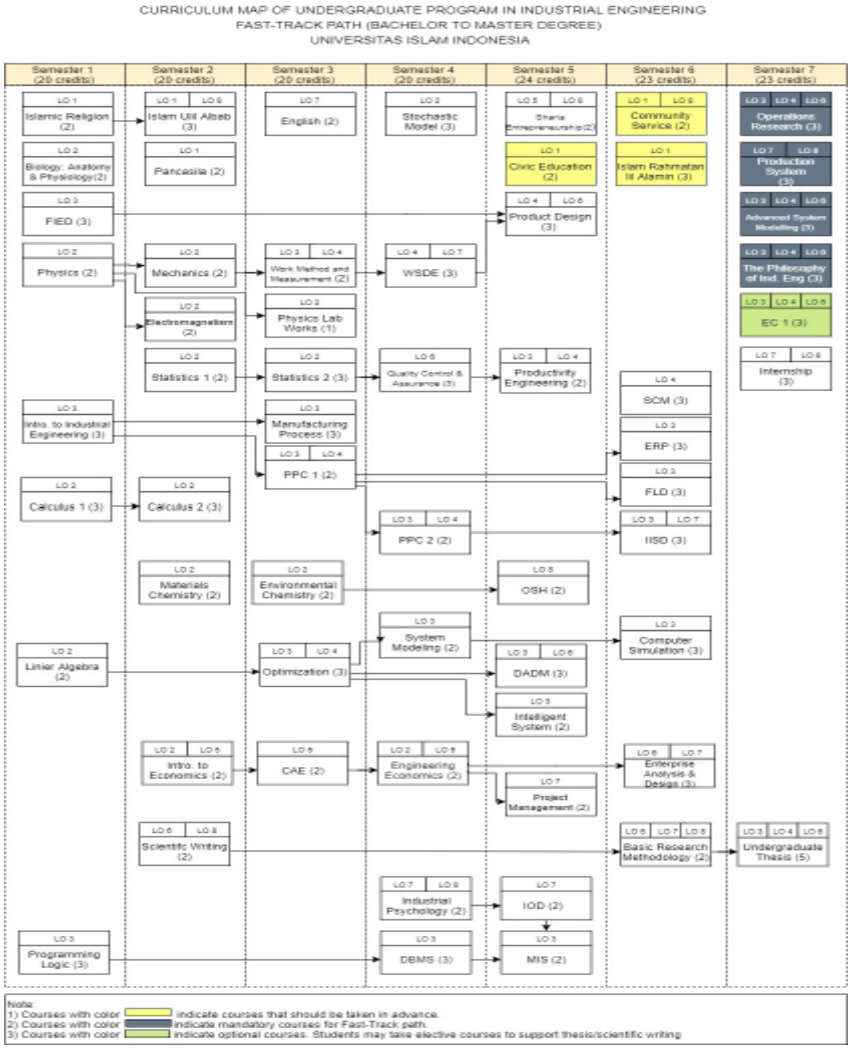


Figure 3. Fast Track S1-S2 MTI UII-NTUST Program Course Path

BUSINESS STARTUP

Pre-Startup & Startup

Two schemes are available for this path, as illustrated in Figure 5, which are:
– Pre-Startup, a technology-based product that completed with a prototype, uncommercialized without business legalization.
– Startup with a technology-based product that is ready to be commercialized.

Eligibility

This path should be settled from the 5th semester with the courses' recommendation, as seen in Figure 6, with the following conditions :

- The students should register and start the path in the early 5th semester.
- Selected courses must meet the scheme of the business startup path.
- Minimum GPA of 3.0
- It could be proposed individually or in the group, but the student must be positioned as the main organizer, such as Chief Executive Officer (CEO), Chief Financial Officer (CFO), Chief Technology Officer (CTO), Chief Innovation Officer (CIO)
- Minimum one lecturer has to be assigned as supervisor.
- The program activity and conversion will be conducted in the 7th semester with accumulated 20 credits, which include Technopreneurship (Elective Course), Enterprise Analysis and Design, Internship, and Undergraduate Thesis.

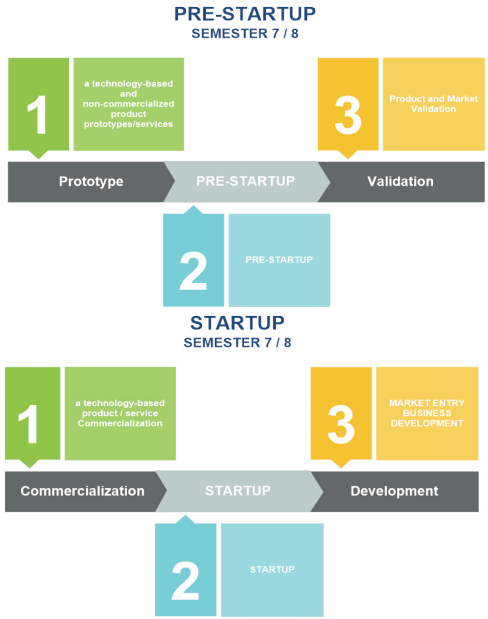


Figure 5. Business Startup Schemes of MBKM

BUSINESS STARTUP PATH

CURRICULUM MAP

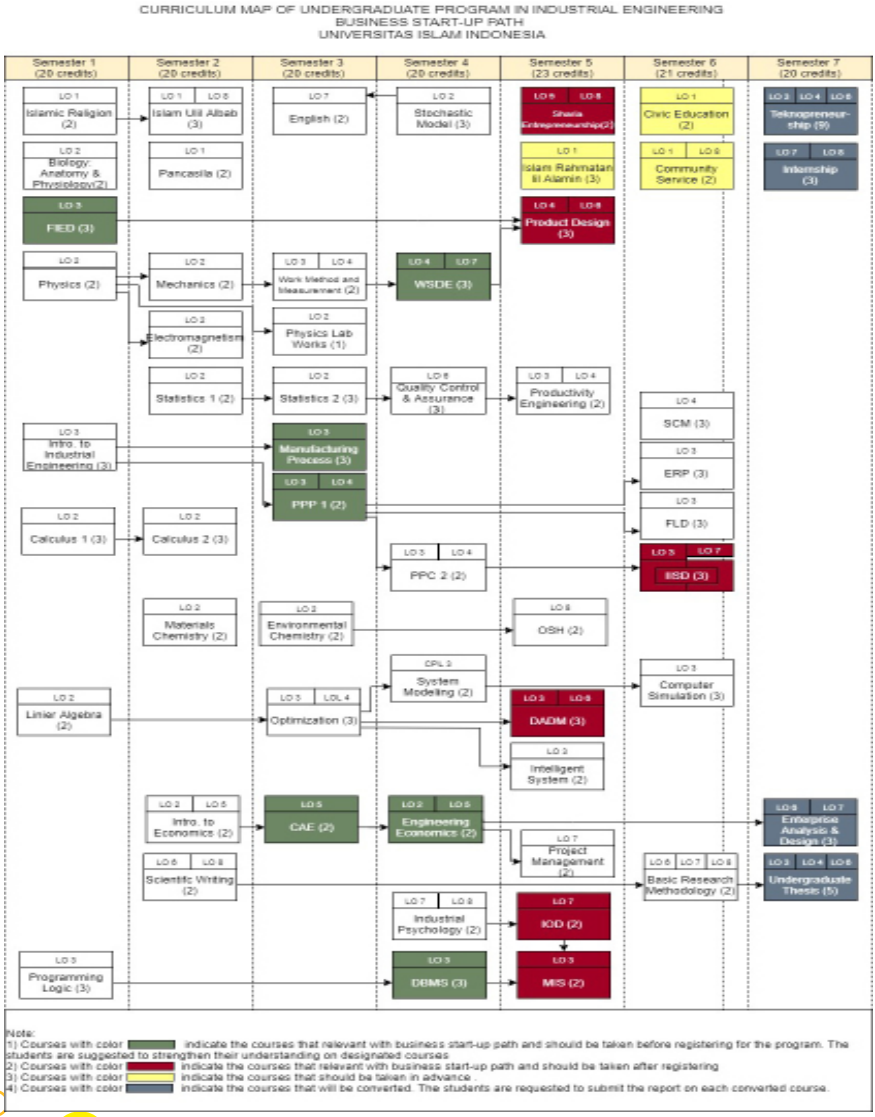


Figure 6. Business Startup Course Path

INTERNSHIP

6 months, 3 months, and BANGKIT Program

Schemes

- A six-months internship is equal to 20 credits, converted to Undergraduate Thesis (5 credits), Internship (3 credits), Enterprise Analysis and Design (3 credits), Elective Course of Industrial System Analysis (9 credits). The recommendation for courses' enrollment per semester could be seen in Figure 7.
- A three-months internship is equal to 11 credits, converted to Undergraduate Thesis (5 credits), Internship (3 credits), Elective Course of Capita Selecta (3 credits). The recommendation for courses' enrollment per semester could be seen in Figure 8.
- BANGKIT Program as stated in the Circular Letter of Head of Undergraduate Program in Industrial Engineering No. 02/Ka.Prodi S1/10/TI/I/2021, equals to 11 credits, converted to Programming Logic (3 credits), Intelligent System (2 credits), Database Management System (3 credits), elective course of Business Intelligent (3 credits), and internship (3 credits).

Preparation

The preparation should be established started from the 5th semester. For its implementation, several alternatives are provided, as follows:

- In 5th semester, the students should register themselves for the **six-months** and **3-months** internship at the administration office of the Undergraduate Program in Industrial Engineering.
- The selection will be performed. Shortlisted candidates will carry out the internship program in the 7th or 8th semester.
- Students who are interested to join internship by **Bangkit** program must register themselves to The Ministry of Education, Culture, Research and Technology, The Republic of Indonesia in the 5th semester. Once they passed the selection, the program will be executed in the 6th semester.

Eligibility

- The internship is performed at the partner companies of Department, Faculty/University
- The students are encouraged to start the procedure as suggested, started from the 5th semester.
- The internship program is conducted in the 7th or 8th semester.
- Minimum GPA of 3.0 and passed the CEPT
- Minimum one lecturer is assigned as the internship supervisor
- The students must perform the course registration (key-in) with courses previously set as the converted subjects. The registration is held in the same semester of program implementation.
- Specifically for internship by Bangkit Program, the requirements will be adjusted with the conditions stated by The Ministry of Education, Culture, Research, and Technology at **http://g.co/bangkit**

INTERNATIONAL INTERNSHIP

SCAN ME

6 months, 3 , and 1 months

Schemes

- International Internships are available for student for internship in overseas such as Vietnam, Japan, and Germany.
- Students may choose their own overseas companies or join with collabotrated company set by IUP IE UII.
- The International internship now is open in Vietnam, Japan, and Germany.
- A six-months internship is equal to 20 credits, converted to Undergraduate Thesis (5 credits), Internship (3 credits), Enterprise Analysis and Design (3 credits), Elective Course of Industrial System Analysis (9 credits). The recommendation for courses' enrollment per semester could be seen in Figure 7.
- A three-months internship is equal to 11 credits, converted to Undergraduate Thesis (5 credits), Internship (3 credits), Elective Course of Capita Selecta (3 credits). The recommendation for courses' enrollment per semester could be seen in Figure 8.
- Scan the above QR Code for complete information

Eligibility

- The internship is performed at the partner companies of Department, Faculty/ University
- The students are encouraged to start the procedure as suggested, started from the 5th semester.
- The internship program is conducted in the 7th or 8th semester.
- Minimum GPA of 3.0 and passed the CEPT
- Minimum one lecturer is assigned as the internship supervisor
- The students must perform the course registration (key-in) with courses previously set as the converted subjects. The registration is held in the same semester of program implementation.
- Check website for more info.

Figure 7. Endress Hauser , Germany

STUDENT ACHIEVEMENT PROGRAM

Achievement Scheme

Other than the three internship schemes, the recent curriculum provides appreciation to students who participate in the Students' Creativity Program (PKM/ Program Kreativitas Mahasiswa) and Teaching Campus Program by The Ministry of Education, Culture, Research, and Technology, as well as other scientific competitions

PIMNAS

The student who earns a gold medal in National Student Scientific Week (PIMNAS/Pekan Ilmiah Mahasiswa Nasional) or earns first place in international competition in Industrial Engineering, achievement will be converted to **1 relevant elective course** and **1 SKP** (participation credit)

Creativity Program

The student who passes the funding for Students' Creativity Program – Community Service, the program will be converted to **Community Service** and **1 SKP (participation** credit)

Teaching Campus Program

Student who accomplishes the Teaching Campus Program, the program will be converted to **Community Service** and **3 SKP (participation credit)**

6-MONTH INTERNSHIP PATH

Semester 7

CURRICULUM MAP OF UNDERGRADUATE PROGRAM IN INDUSTRIAL ENGINEERING
SIX-MONTHS INTERNSHIP (7th SEMESTER)
UNIVERSITAS ISLAM INDONESIA

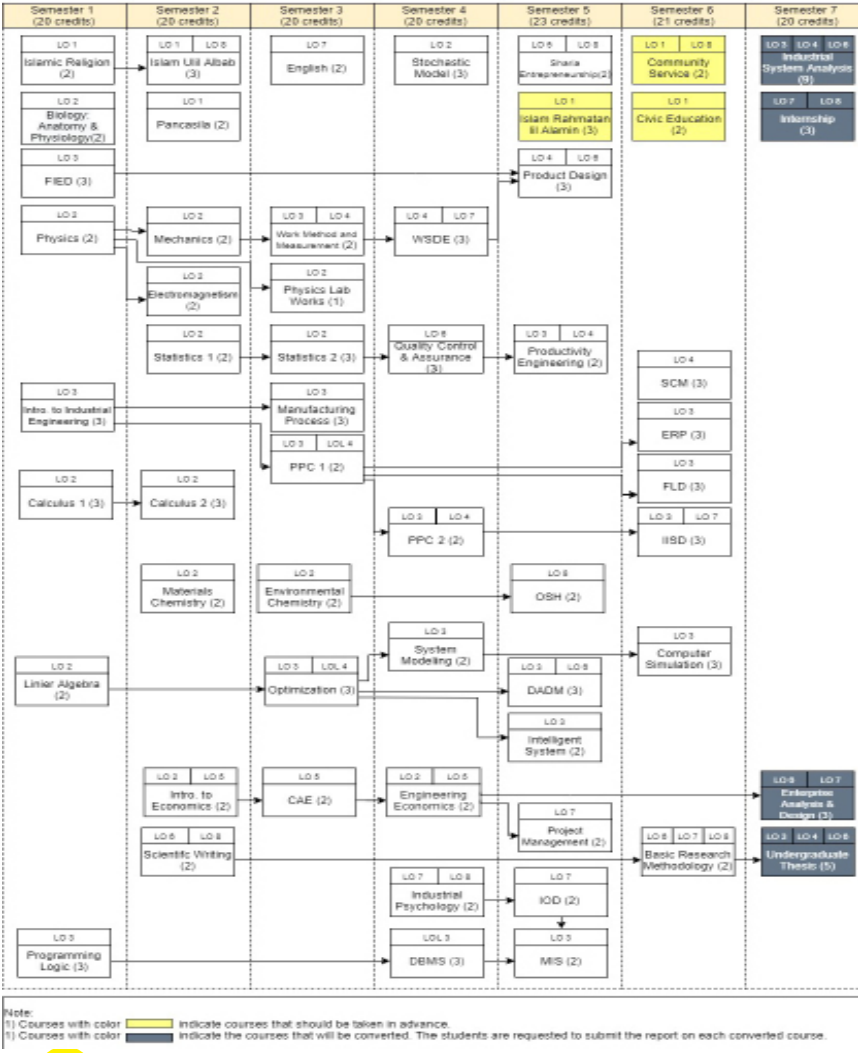


Figure 8. 6-month Internship (7th Semester) Course Path

6-MONTH INTERNSHIP PATH

Semester 8

CURRICULUM MAP OF UNDERGRADUATE PROGRAM IN INDUSTRIAL ENGINEERING
SIX-MONTHS INTERNSHIP (8th SEMESTER)
UNIVERSITAS ISLAM INDONESIA

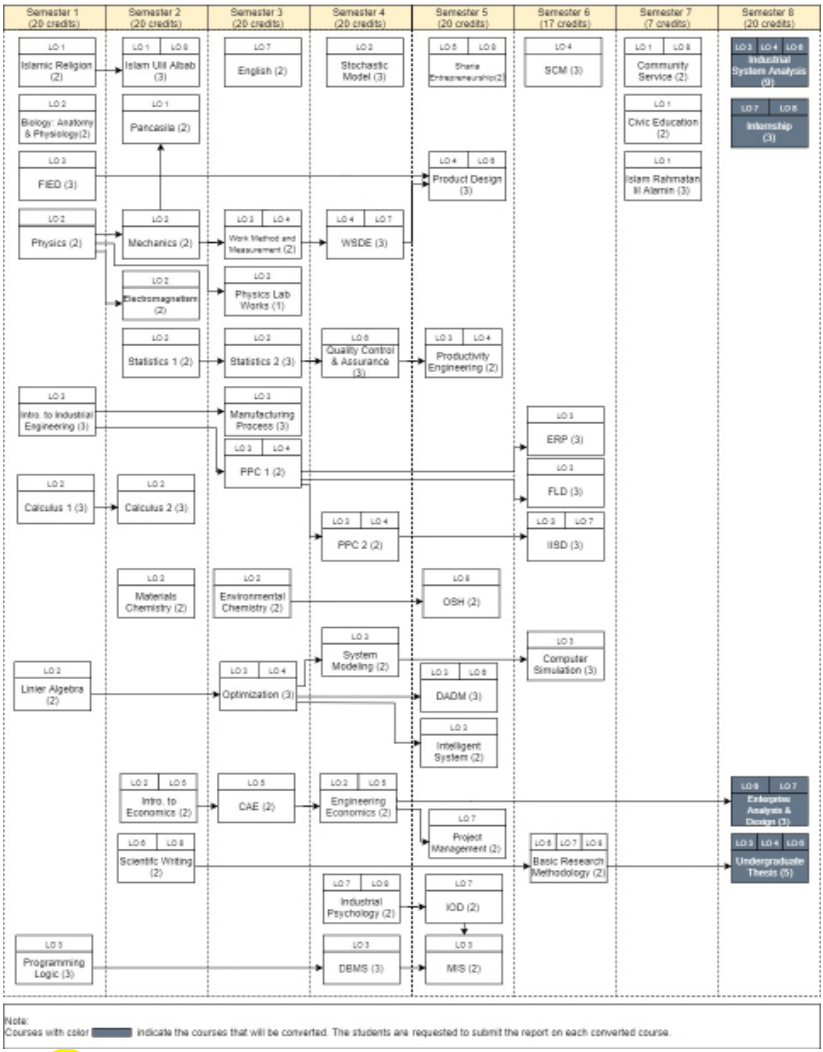


Figure 9. 6-month Internship (8th Semester) Course Path

3-MONTH INTERNSHIP PATH

Semester 8

CURRICULUM MAP OF UNDERGRADUATE PROGRAM IN INDUSTRIAL ENGINEERING
THREE-MONTHS INTERNSHIP (8th SEMESTER)
UNIVERSITAS ISLAM INDONESIA

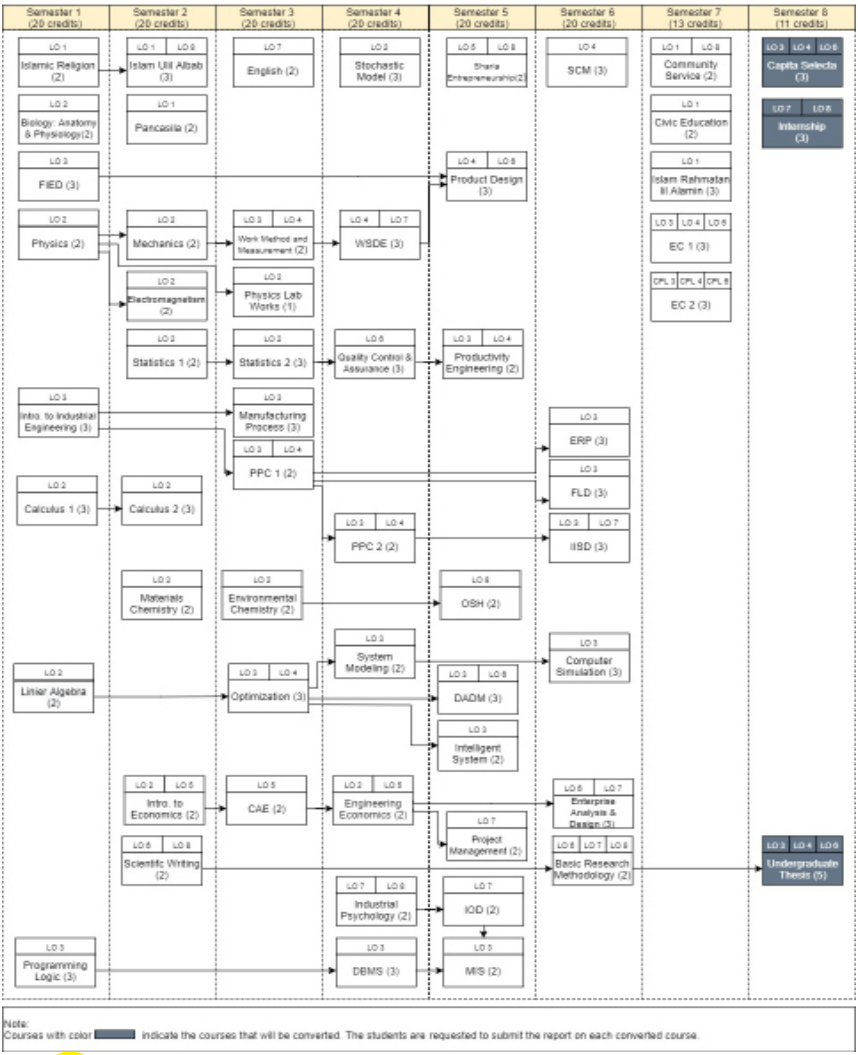


Figure 10. 3-month Internship (8th Semester) Course Path

LEARNING-OUTCOME CURRICULUM ASSESSMENT DESIGN

LEARNING OUTCOME NO	LEARNING OUTCOME DESCRIPTION	INDICATORS	KEYWORDS	METHODS OF ASSESMENTS COURSE	COURSE LEARNING OUTCOME (CLO)	SEMESTER
1	Able to express the attitude of devotion towards One True God, by applying the sharia in daily life and upholding the universal Islamic ethics	Students understand the nature of human creation as Allah servant	Understanding human's nature	Islamic Religion	CLO 1: Explaining the concept of human's nature and hidayah as cited from Al-Qur'an and Hadits	1
		Students could interpret the values of Ulil albab	Interpreting Ulil Albab value	Islam Ulil Albab	CLO 1: Explaining and reflecting the concept of ulil albab based on Al-Qur'an and Hadits, in daily life	2
		Students could illustrate the integration of Islamic value with the fields of knowledge	Demonstrating Islamic value	Islam Rahmatan Lil Alamin	CLO 3: Demonstrating the thoughts, products and/or work result as the actualization of integration between Islamic value and fields of knowledge	7
2	Able to apply natural, mathematical, and social sciences to acquire a comprehensive engineering-principle understanding	Able to identify the scientific concepts in industrial problems	Applying basic science	Physics Laboratory Work	CLO 2: Able to solve problems related to the physics law	3
		Able to apply the formulas in mathematics in solving industrial problems	Applying Mathematical	Stochastic Model	CLO 3: Able to apply the theories and stochastics model to support decision making in various cases	4
		Able to implement the economic principles to assess the feasibility of industrial investment	Applying economics	Engineering Economics	CLO 2: Able to apply engineering economics in decision making, related to investment	4
3	Able to design and implement modern engineering tools, methods, and skills to elevate information-technology-based integrated systems performance	Students could design a simple system, including identifying the entities involved	Designing system	Database Management System	CLO 2: Students could design a proper and correct database by considering the aspect of engineering and technology	4
		Students could employ IT software that recently developed in Industrial Engineering for system integration	Implementing IT tools	Management Information System	CLO 2: Students understand about Management Information System, functionally and structurally, including the application related, which are: data management and knowledge, decision support system, e-business, e-commerce, e-government, artificial intelligence, enterprise resource planning	5
		Students could evaluate system weaknesses and suggest the improvement for productivity enhancement	Improving performance	Integrated Industrial System Design	CLO 2: Students could share the idea on innovation in design and technology-based product prototype	6
4	Able to evaluate integrated system governance particularly in Supply Chain	Students could explain the product flow and information in a company	Understanding model and system	Production Planning and Control 1	CLO 2: Students could make a production plan in industrial case, based on closed-loop MRP II	3
		Students could understand the supply chain system and entities related	Formulating Model	Production Planning and Control 2	CLO 2: Students could understand the concept and application of advanced production system	4
		Students could assess the performance of the supply chain system by using SCOR as a measurement tool	Examining measurement tools	Supply Chain Management	CLO 1: Students could apply SCOR to measure the supplier performance	7

LEARNING-OUTCOME CURRICULUM ASSESSMENT DESIGN

LEARNING OUTCOME NO	LEARNING OUTCOME DESCRIPTION	INDICATORS	KEYWORDS	METHODS OF ASSESMENTS COURSE	COURSE LEARNING OUTCOME (CLO)	SEMESTER
5	To have the Islamic-value-based Entrepreneurship character	Students could determine factors of determination for appropriate production cost	Identifying production cost factors	Introduction to Economics	CLO 3: Students could explain the determination of production cost factor, wage determination, labor market, international trade and open market	3
		Students could estimate the production cost	Estimating the product cost	Cost Analysis and Estimation	CLO 2: Students could calculate the production fix cost using various methods	5
		Students could suggest the business innovation based on Islamic norms	Differentiating business	Sharia Entrepreneurship	CLO 2: Students could arrange the business plan concept for entrepreneurship, as ruled by Islamic sharia on their preferred business field	2
6	Able to identify, formulate problems, design and conduct an appropriate experiment, process, analyze and interpret data, and solve engineering problems	Students could conduct scientific research to settle simple problems	Solving simple problem	Scientific Writing	CLO 2: To write and to perform the presentation, in terms of coherent and structured academic writing that meet the guideline for Indonesian spelling, scientific writing and anti-plagiarism	2
		Students could identify possible problems and select the appropriate method to solve them	Solving engineering problem	Decision Analysis and Data Mining	CLO 3: The students could apply the data mining techniques in real cases	5
		Students could give recommendations or action plans in solving the problems	Solving complex engineering problem	Undergraduate Thesis	CLO 1: Students could design, improve and install the integrated system by employing the knowledge and understanding in Industrial Engineering disciplines based on logical, critical, systematic, and innovative thinking	8
7	Able to manage teams and organizations and deliver ideas in a global environment	Students could collaborate in a team to solve complex problems	Organizing team to solve complex engineering problem	Integrated Industrial System Design	CLO 4: Students could collaborate in a team to solve complex problems.	6
		Students could communicate the ideas in the limited environment	Arguing in a local environment	English	CLO 3: Students could actively describe their profile and topics in a certain field, effectively and impressively in English	3
		Students could communicate the ideas in the global environment	Arguing in global environment	Internship	CLO 1: Students could use the science and present the work result in an integrated way in the broader environment	8
8	Becoming an ethical, adaptable, and lifelong learner professional	Students could reflect work ethics, in terms of profession	Recognizing work ethics	Industrial Psychology	CLO 2: Students could explain the concept of harmony, ethics, and harmonization in human relations, technology, industry, and its environment	4
		Students could adapt and contribute to society	Identifying personal contribution	Community Service	CLO 4: Students could plan, coordinate, carry out, evaluate the program in a preferred field of knowledge that involves society directly	7
		Students could collect information actively and independently	Actively organizing information	Internship	CLO 4: Students could search deeper information regarding problems assigned as a task in the internship program	8

CAPSTONE DESIGN

6 months, 3 months, and BANGKIT Program

Schemes

- In curriculum 2021 of the Undergraduate Program in Industrial Engineering, The course of Integrated Industrial System Design is designed as a capstone design course. The students are expected to attain experience in evaluating the complex system problem as well as to provide improvement for enhancing productivity. This course requires students to practice the knowledge previously studied in class, independently and integrally. 9 courses support the capstone design, originally derived from 3rd – 5th semester, as follows: Cost Analysis and Estimation, Manufacturing Process, Production Planning and Control, Engineering Economics, Work System Design and Ergonomics, Product Design, Industrial Organization Design Management Information System and Decision Analysis and Data Mining

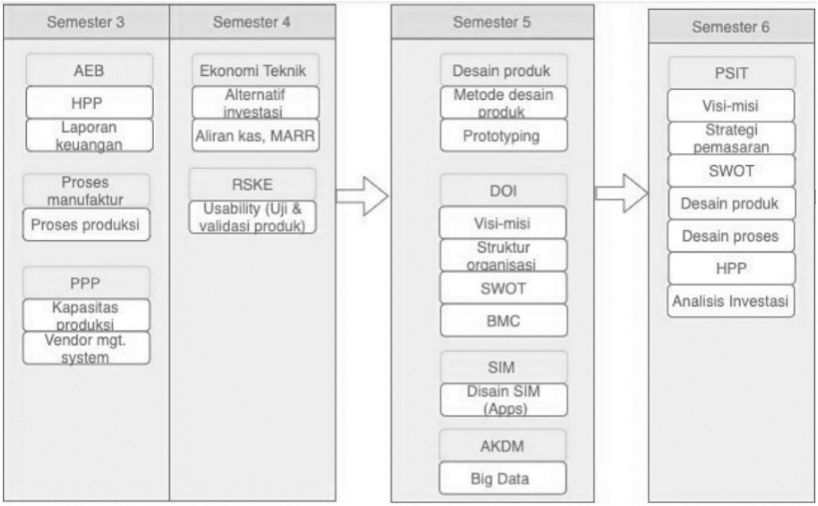


Figure 13. Capstone Design Course Flow

The project is assigned in the group to sharpen the students' working-in-team ability, particularly in solving engineering complex problems. Each group will initiate a startup by previously determines the company's vision and mission, business model canvas, market demand, and product determination based on big data analysis. Later, it performs product design, prototyping, HPP calculating, pricing strategy, product selling, pitching business, and evaluation of product's financial performance.

INTERNATIONAL MOBILITY

Everybody can go abroad with IUP IE UII

Schemes

All IUP IE students must have at least one international exposure. Every IUP IE UII Student will definitely go abroad for international mobility. Various programs with a partial or full IUP Scholarship are offered:

- International Educational Visit
- International Internships (Europe, Vietnam, Japan, and more)
- Student Exchange
- International Credit Transfer (ICT)
- Double Degree and FastTrack Program Package A (only 5 years, a student will earn S.T., B.Eng, M.Eng)
- Double Degree and FastTrack Program Package B (only 5 years, a student will earn S.T., M.T., MBA)
- P2A Program (Pessage to ASEAN)
- IISMA Program (Indonesian International Student Mobility Award)
- International Community Service
- The best paper for International Conferences
- International Competition

Figure 14. Edication Visit in Western Europe 2022

- Students are advised to hold passports from the beginning of the semester.

INTERNATIONAL CERTIFICATION

Schemes

To sharpen students' competence, the most prominent professional certification enriches their professional portfolio to gain international recognition for competing in the global business environment.

SAP /4HANA
SAP/4HANA certification provides proof of IUP IE Student's skill in employing application software for Enterprise Resource Planning to manage the integrated information systems of an organization. This certification is one of the high-demand skills in the industry 4.0 era.

CAPM
Certified Associate in Project management is an asset for students to show their competence in working on project teams. It will distinguish the IUP IE graduates in job market competition. Holding this certificate will keep students on the fast track to filling high-demand skills in project-oriented roles in various businesses.

CALSC
Certified Associate in Lean Supply Chain strengthens the IUP IE students' bargaining power to win the job market competition. This certificate will expose global recognition of IUP IE students' skills in lean management with the lean supply chain. CALSC emphasizes learning how to increase customer value, im-

Figure 14. Professional Certification for IUP IE Students

BRIDGING PROGRAM

Schemes

Bridging Program (BP) are set to IUP IE UII students in their first year. This program aims at bridging the gap between high school learning and university learning. This one-year program prepares freshmen to be active in all classroom forums, to be critical thinkers, to be effective communicators, and to be innovative leaders. Furthermore, BP will equip the students with proficiency in English to complete the academic requirements of the International Program successfully.

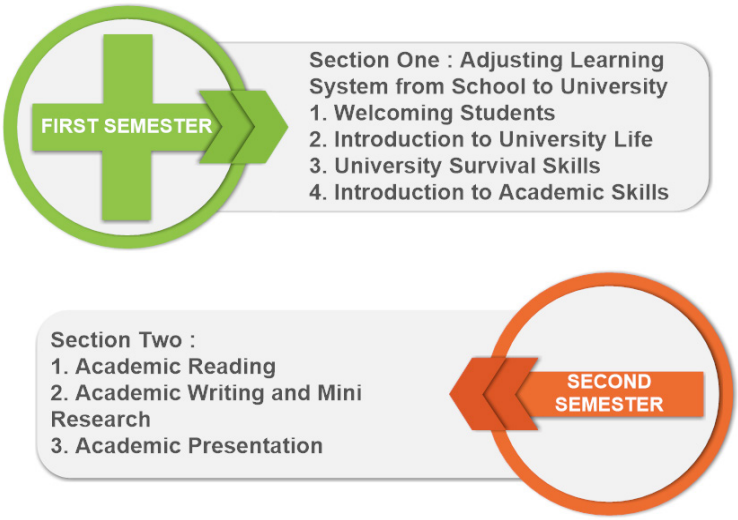


Figure 15. Brdiging Program

JOB CONNECTOR

Schemes

The graduates of International Program Industrial Engineering UII (IUP IE UII) usually have at least three alternatives to take for their future career: to work, to continue their study or to establish their own business, but the majority of them choose to work, for multinational company, national/international bank, or government institutions. Whatever career they are going to take, the IUP IE UII graduates still need a real picture of what real job hunting is like, how it feels when it comes to the real competition, and how to win the competition. Students, are anxious and need to be motivated, to be inspired, and more importantly, they need models, examples of IP IE UII graduates who have the experience to meet and win harsh of global completion.

This program aims to bridge the gap between the university to the real workplace. IUP IE UII invoites alumni who are now successful in their workplace and will provide a workshop for producing an effective resume and conducting an effective interview. It is expected that students who are in their 4th semester are more aware of what they need to prepare to reach their dream job.

JOB CONNECTOR provides students with hardskill Booth Camp for three months in the field of Data Science and or Digital Marketing. The hardskills booth camp are additional training program to the previous professional certification to promote students directly to companies for employement. The program replicates MBKM Program for three months and earns credit transfers. The eligibility :

- 7/8th semester students preparing graduation (at most 3 months before graduation).
- Commit to have 3-month fulltime Bootcamp on Data Science or Digital Marketing.
- Terms and Conditions apply

The expertise offered will be dinamically changed based on business requirements.

tokopedia gojek jenius pegipegi sinarmas PopBox ALODOKTER CIMB NIAGA TELKOMSEL + Dan Masih Banyak Perusahaan Lainnya

Figure 16. Job Connector Program

STUDENT MANDATORY ACTIVITES

Achievement Scheme

Several activities are facilitated to support graduates' profiles. Those activities will be documented in the Diploma Companion Certificate (SKPI/Surat Keterangan Pendamping Ijazah). The table below describes the activity's detail and weight of participation credits (SKP/Satuan Kredit Partisipasi).

PIMNAS

The student who earns a gold medal in National Student Scientific Week (PIMNAS/Pekan Ilmiah Mahasiswa Nasional) or earns first place in international competition in Industrial Engineering, achievement will be converted to **1 relevant elective course** and **1 SKP** (participation credit)

Creativity Program

The student who passes the funding for Students' Creativity Program – Community Service, the program will be converted to **Community Service** and **1 SKP (participation** credit)

Teaching Campus Program

Student who accomplishes the Teaching Campus Program, the program will be converted to **Community Service** and **3 SKP (participation credit)**

SYLLABUS OF UNDERGRADUATE PROGRAM in INDUSTRIAL ENGINEERING

Semester 1

UNI600 –Islamic Religion
Prerequisites: None
Material:
Human's nature: why human needs God, Tauhid, Pillars of Faith, Pillars of Islam

References:

1. Drafting Team (2016), Pendidikan Agama Islam untuk Perguruan Tinggi, Dirjen Pembelajaran dan Kemahasiswaan Kemenristekdikti RI, dapat diakses melalui tautan https://belmawa.ristekdikti.go.id/2016/12/09/surat-edaran-bahan-ajar-mata-kuliahwajib-umum/
2. Ahmad Azhar Basyir,1990 Pendidikan Agama Islam I (Aqidah), PerReferencesan FH UII. 3. Shalih Bin Fauzan bin Abdullah Al- Fauzan, 1999., Kitab Tauhid 1,2 dan 3 , Yogyakarta, Fakultas Ilmu Agama Islam Universitas Islam Indonesia, Pusat Dakwah dan pelayanan Masyarakat
3. Ahmad Azhar Basyir, Manusia dalam Islam
4. DPPAI UII, Aqidah Islam

STI101 –Calculus 1
Prerequisites: None
Material:
Set, Real Number System, Equation and Inequation, Function, Graph of Function, Limit of Function, Derivative, Derivative of Trigonometric Functions, and Inverse Function, Derivative of Implicit Function, Higher-Order Derivative, Partial Derivative, Derivative application: min/max value, upward/downward function, Economic Order Quantity, L'Hospital Theorem

References:

1. Purcell Edwin, Varberg Dale and Rigdon Steven, 2005, Kalkulus, edisi 5, Penerbit Erlangga, Jakarta
2. Martono Koko,1999,Kalkulus, Penerbit Erlangga, Jakarta
3. Soemartojo N, 1995, Kalkulus, edisi 3, Penerbit Erlangga Jakarta
4. Stewart James, 2002, Kalkulus, edisi 4, Penerbit Erlangga Jakarta

SYLLABUS OF UNDERGRADUATE PROGRAM in INDUSTRIAL ENGINEERING

Semester 1

STI103 –Introduction to Industrial Engineering
Prerequisite(s): None
Material: History, definition, the body of knowledge of Industrial Engineering, System Thinking. Scientific basis in Industrial Engineering: Production Process, Standard Time, Quality Control, etc
References:

1. Hick, P., (1977) Introduction to Industrial Engineering and Management Science, Tokyo: McGraw Hill.
2. Turner, W., C. (1078) Introduction to Industrial System Engineering, Englewood Cliffs, New Jersey: Prince Hall.

STI104 –Programming Logic
Prerequisite(s): None
Material: 1. Introduction to Computers and Programming Logic 2. Modules 3. Structures 4. Making Decisions 5. Repetition Structures 6. Array 7. File Handling and Exceptions 8. Advanced-Data Handling 9. Advanced Modularization 10. Object-Oriented Programming 11. OOP and UML Modeling 12. Scikit Learn
References:

1. Farrell, J., 2014, Programming Logic and Design, Comprehensive(8th edition), Cengage Learning, USA
2. Gaddis, T., 2019, Programming Logic and Design (5th edition), Pearson Education, NY.
3. Deitel, J.P. & Deitel J. H., 2020, Intro to Python for Computer Science and Data Science: Learning to Program with AI, Big Data and The Cloud (1st edition), Pearson Education. NY

STI105 –Fundamental of Industrial Engineering
Prerequisite(s): None
Material: Measurement, Tolerance, General Geometrical Tolerance, Sketch, Standard Projection in Engineering Drawing, CAD/CAM/CAE, Industrial Engineering Diagram
References:

1. Gaddis, T. (2013). Starting out with programming logic and design (3rd ed). Boston: Pearson.
2. Venit, S., & Drake, E. (2014). Prelude to programming: concepts and design (6th edition). Boston: Addison-Wesley

SYLLABUS OF UNDERGRADUATE PROGRAM in INDUSTRIAL ENGINEERING

Semester 1

STI106 –Linear Algebra

Prerequisite(s): None

Material: 1. Matrix (Types and Operation) 2. Linear Equation System by using Gauss Elimination method and Gauss-Jordan Elimination Method 3. Inverse Matrix 4. Matrix Determinant 5. Vector Operations 6. Vector Space and Euclidean Vector Subspace 7. Basis and Dimension, Linear Transformation (Rn to Rm), Eigen Value, and Matrix Eigen Vector.

References:

1. Anton H., 2004, Aljabar Linier Elementer, edisi kedelapan, John Wiley & Sons, New York.

STI107 –Biology: Anatomy and Physiology

Prerequisite(s): None

Material: 1. Introduction to Biology: Anatomy and Physiology 2. Human Body System 3. Cardiovascular/Circulatory System, Respiration, Musculoskeletal, Nerves 4. Introduction to physiological property (heart rate, etc) 5. Five Senses 6. Physiology 7. Metabolism 8. Introduction to Basic Ergonomics (Human limitation) 9. Process of Human Information and Human Error 10. Human's Physical Work 11. Basic Psychological Concept in Human Behavior

References:

1. Singleton, W. T. (Ed.). (1982). The body at work: Biological ergonomics. Cambridge University Press.
2. Åstrand, P. O. (2003). Textbook of work physiology: physiological bases of exercise. Human Kinetics.
3. Grandjean, E. (1986). Fitting the Task to the Man An Ergonomic Approach. London & Philadelphia: Taylor & Francis.
4. Tayyari, F., & Smith, J. (1997). Occupational Ergonomics: Principles and Applications. Chapman & Hall.
5. Helander, M. (2005). A guide to human factors and ergonomics. CRC Press.
6. Wickens, C., Gordon, S., & Liu, Y. (1997). An Introduction to Human Factor Engineering. New York: Addison-Wesley Educational Publisher, Inc.
7. Freivalds, A., & Niebel, B. (2013). Niebel's Methods, Standards, & Work Design. Mcgraw-Hill higher education.
8. Tarwaka, Solichul HA Bakri, dan Lilik Sudiajeng. 2004. Ergonomi untuk Keselamatan, Kesehatan, dan Produktivitas, Surakarta: Uniba Press
9. Nurmianto, E. Ergonomi : Konsep Dasar dan Aplikasinya. Penerbit Guna Widya. Surabaya. 2004
10. Sritomo Wignjosoebroto. 2003. Ergonomi Studi Gerak dan Waktu, Teknik Analisis Untuk Peningkatan Produktivitas Kerja, Surabaya: Penerbit Guna Widya
11. Suma'mur PK, Higiene Perusahaan dan Kesehatan Kerja, PT Gunung Agung, Jakarta.
12. Bridger: Introduction to Ergonomics

SYLLABUS OF UNDERGRADUATE PROGRAM in INDUSTRIAL ENGINEERING

Semester 2

UNI601 –Islam Ulil Albab

Prerequisite(s): Islamic Religion

Material: Tafsir Maudhu'i/thematic of Islam Ulil Albab (originated from Al-Quran, Sunnah dan Ulama recommendation), Interpreting ijtihad and its role in the context of Islamic teaching Islam (Islām solihun likulli zamān wa makān), Umar's thoughts in understanding Al-Quran, Genealogy of Islamic intellectual (genealogy: pedigree or origin), The genealogy of Islamic intellectual is a discussion about the pedigree or the origin of Islamic intellectual), The dynamic thought in Islam, Introduction to Islamic Civilization, The History of Islamic Civilization in Classical and Medieval Era, Analysis on factors that support Islamic Civilization Glory and Retrogression, The History of Islamic Civilization in Modern Era, Islamic Civilization in Indonesia, Analysis on factors that support the rise of Islamic Civilization, the history of UII development, the exemplary of UII's founding fathers and leaders.

References:

1. Abu Ameenah Bilal Philips, The Evolution of Fiqh: Islamic Law & The Madh-habs (1996). Riyadh: International Islamic Publishing House, https://d1.islamhouse.com/data/en/ih_books/single/en_evolution_of_fiqh.pdf
2. Abdul Karim, M. (2012). Sejarah Pemikiran Peradaban Islam, Yogyakarta: Bagaskara
3. Arief, Abd. Salam (2017). "Ijtihad dan Dinamika Hukum Islam", IN RIGHT: Jurnal Agama dan Hak Asasi Manusia, Vol. 7, No. 1, https://core.ac.uk/download/pdf/229718736.pdf
4. Aqib, Kharisun (t.t). Tafsir Akhlaqi: Kajian Tafsir Tematik tentang Ulul Albab dan Dzikir dalam alQuran, Nganjuk: Lembaga Studi al-Quran Ulul Albab Nganjuk
5. Harjono, Anwar, dan Hakiem, Lukman (2013). Di Sekitar Lahirnya Republik Bhakti Sekolah Tinggi Islam (UII) dan Balai Muslimin Indonesia kepada Bangsa, Yogyakarta: UII
6. Hayder, Abdullah, Mazhab Fiqh: Kedudukan dan Cara Menyikapinya (2004). Riyadh: Dar Khalid alWaleed Publishing https://d1.islamhouse.com/data/id/ih_books/single/id_Mazhab_Fiqh_Kedudukan_dan_Cara_Menyik apinya.pdf
7. Hitti, Philip K (2008). History of the Arabs, Jakarta: Serambi
8. Ibnudin (2019). "Pemikiran Isu-isu Kontemporer dalam Dunia Islam," Al-Afkar, Vol. 2, No. 1, http://garuda.ristekbrin.go.id/documents/detail/910854
9. Kamil, Sukron (2013). Pemikiran Politik Islam Tematik, Jakarta: Kencana Pranada Media
10. Lapidus, Ira M. (2000). Sejarah Sosial Ummat Islam, Jakarta: PT Raja Grafindo Persada
11. Ruslan, Idrus (2019). "Dominasi Barat dan Pengaruhnya terhadap Dunia Islam," Al-Adyan: Jurnal Studi Lintas Agama, Vol. 14, No. 1, DOI:https://doi.org/10.24042/adyan.v14i1.4484
12. Muhammad, Suwarsono (2019). UII Way: Menjadi Islami, Indonesiawi, dan Mondial, Depok, Rajawali Press
13. Priyono, AE (Ed.). (2013). Api Putih di Kampus Hijau: Gerakan Mahasiswa UII Dekade 1980-an, Mata Bangsa
14. Qasim A. Ibrahim, Muhammad A. Saleh (2014). Buku Pintar Sejarah Islam: Jejak Langkah Peradaban Islam dari Masa Nabi hingga Masa Kini, Jakarta: Zaman
15. Razak, Abdur, dan Anwar, Rosihan (2012). Ilmu Kalam, Ed. Revisi, Bandung, References Setia
16. Sjadzali, Munawir (1997). Ijtihad Kemanusiaan, Jakarta: Paramadina

SYLLABUS OF UNDERGRADUATE PROGRAM in INDUSTRIAL ENGINEERING

Semester 2

UNI603 –Pancasila

Prerequisite(s): None

Material: Significance and Urgency of Pancasila Approach Method, Development and the Implementation of Pancasila Values and Principles in daily life, The Meaning of Pancasila as Ideology and Ethics, The Meaning of The 1945 Constitution Preamble, Pancasila Relationship, Philosophy, Religion, and Culture, Pancasila Relationship, and Clean & Good Governance, Multiculturalism.

References:

1. Driyarkara, (1978), Pancasila & Religi, Tanpa Penerbit.
2. Eka Dharmaputera, (1982), Pancasila: Identitas & Modernitas, BPK Gunung Mulia, Jakarta.
3. Hakim, Alif Lukmanul, (2015), Modul Pendidikan Pancasila, Ilmu Komunikasi UII Press.
4. Kaelan, (2002), Filsafat Pancasila, Paradigma, Yogyakarta.
5. Kaelan, (2002). Pendidikan Pancasila. Paradigma. Yogyakarta.
6. Notonagoro,(1971), Pancasila Secara Ilmiah Populer, Pancuran Tujuh, Jkt.
7. Pranarka, (1989), Sejarah Perumusan Pancasila, Jakarta.
8. Lye, John, (1997), Ideology: A Brief Guide, (http://www.brocku.ca/english/jlye/ideology.htm1)

UNI607 –Scientific Writing

Prerequisite(s): None

Scientific writing in IUP IE Program will be a part of Bridging Program discussed earlier.

STI201 –Calculus 2

Prerequisite(s): Calculus 1

Material: Indefinite Integral: Definition, Basic Formula, integral method, substitution method, partial integral, trigonometry integral, improper integral and indefinite integral, integration by reduction. Integral application: area, volume, the center of mass, etc, double integral. Differential equation: first order, definite integral, Laplace Transforms, Fourier Series

References:

1. Purcell Edwin, Varberg Dale and Rigdon Steven, 2005, Kalkulus, edisi 5, Penerbit Erlangga, Jakarta
2. Martono Koko,1999,Kalkulus, Penerbit Erlangga, Jakarta
3. Soemartojo N, 1995, Kalkulus, edisi 3, Penerbit Erlangga Jakarta
4. Stewart James, 2002, Kalkulus, edisi 4, Penerbit Erlangga Jakarta

SYLLABUS OF UNDERGRADUATE PROGRAM in INDUSTRIAL ENGINEERING

Semester 2

STI202 –Electromagnetism

Prerequisite(s): Physics

Material: Electrostatics, electricity current, magnetism, electromagnetic induction, basic of micro-controller, alternating current, the utilization of electricity and magnet to the micro hydro electrical power generator

References:

1. J. L. Meriam and L. G. Kraige, Engineering Mechanics, Vol I – Statics, Vol II –Dynamics, 6th Ed, John Wiley, 2008.
2. F. P. Beer and E. R. Johnston, Vector Mechanics for Engineers, Vol I - Statics, Vol II Dynamics, 9th Ed, Tata McGraw Hill, 2011.

STI203 –Statistics 1

Prerequisite(s): None

Material: Scope and Urgency of The Utilization of Industrial Statistics. The Theory of Descriptive Statistics, Data and Processing (centralization size, location size, and distribution size) of single data, Data and Processing (centralization size, location size, and distribution size) of grouped data, Graph (Histogram, Polygon, Ogif, Pie Chart, Scatter Plot, Box Plot, etc). Data Processing Using Software (Microsoft Excel). Basic Theory of Probability, Combination, Variation, Repeated Variation, Conditional Probability, and Bayes' Theorem, Ransom Variable & Random Variable Probability Distribution, Discrete Probability Distribution, Sampling Technique and Continue Probability Distribution

References:

1. Harinaldi. (2005). Prinsip-Prinsip Statistik untuk Teknik dan Sains. Penerbit Erlangga.
2. Bluman, A. G. (2012). Elementary Statistics A Step By Step Approach 8th Edition. New York: McGraw Hill.
3. Boediono & Koster, Wayan. (2014). Teori dan Aplikasi Statistika dan Probabilitas Edisi Kelima. Bandung: PT Remaja Rosdakarya
4. Walpole, R., Myers, R. H., & Ye, K. (2011).Probability and Statistics for Engineers and Scientists 9th Edition. New Jersey: Prentice Hall Inc.
5. Fauzy, A. (2008). Statistik Industri. Penerbit Erlangga.

SYLLABUS OF UNDERGRADUATE PROGRAM in INDUSTRIAL ENGINEERING

Semester 2

STI204 –Mechanics

Prerequisite(s): Physics

Material: Introduction to Moment and Couple Moments, Equilibrium, Beam and Frame, Centralized-Load Beam, Distributed-Load Beam, Tension

References:

1. J. L. Meriam and L. G. Kraige, Engineering Mechanics, Vol I – Statics, Vol II – Dynamics, 6th Ed, John Wiley, 2008.
2. F. P. Beer and E. R. Johnston, Vector Mechanics for Engineers, Vol I - Statics, Vol II Dynamics, 9th Ed, Tata McGraw-Hill, 2011.

STI205 –Introduction to Economics

Prerequisite(s): None

Material: Basic concept of Economics, Principles of Islamic Economics, Theory of Supply and Demand, Market Mechanism and Government's Role in Economy, The Balance of National Income, Money, Bank, and Monetary Policies, Theory of Consumer Behaviour, Theory of Producer Behaviour, Market Structure, The Determination of Production Factor Cost, Wages Determination and Labor Market, International Trade and Open Market

References:

1. Mankiw, N.G., 2006. Macroeconomics, Worth Publisher New York
2. Nicholson, W., 2004. Microeconomics, Thomson Ohio
3. Nopirin, 2000. Pengantar Ilmu Ekonomi Makro dan Mikro, BPFE Yogyakarta
4. Rahman A, 1996. Doktrin Ekonomi Islam, Dana Bhakti Wakaf Yogyakarta

STI206 –Materials Chemistry

Prerequisite(s): None

Material: 1. Structure, Properties, and Chemical Changes to Matter, 2. Organic and Inorganic Chemistry, Polymer and Composite 3. Advanced Materials 4. NanoMaterials and Technology 5. Smart Materials 6. Green Materials

References:

1. Bradley D. Fahlman, 2007, Materials Chemistry, Springer Nature Switzerland AG
2. James K. Wessel, 2004, Handbook of Advanced Materials: Enabling New Designs, John Wiley & Sons, Inc.
3. Lichtfouse, Eric, Schwarzbauer, Jan, Robert, Didier (Eds.), 2013, Green Materials for Energy, Products and Depollution, Springer Press
4. Mohsen Shahinpoor, 2020, Fundamentals of Smart Materials, Royal Society of Chemistry Publ
5. Hussein, 2018, Handbook of NanoMaterials for Industrial Applications, Elsevier Publ
6. Robert, Vajtai, 2012, Handbook of NanoMaterials, Springer Press

SYLLABUS OF UNDERGRADUATE PROGRAM in INDUSTRIAL ENGINEERING

Semester 3

UNI606 –English
Prerequisite(s): None
Material: Englsih will be part of Bridging Program.

STI301 –Work Method and Measurement
Prerequisite(s): Mechanics
Material: Introduction of Work Method and Measurement, Physical Workload, Biomechanics, Work Method Analysis, Work Posture, Mental Workload, Productivity, Motion Study (Effective and ineffective), Time Study, Work Sampling, Indirect Work Measurement (MTM MOST), Physical Work Environment
References:

1. Bridger: Introduction to Ergonomics
2. Åstrand, P. O. (2003). Textbook of work physiology: physiological bases of exercise. Human Kinetics.
3. Tayyari, F., & Smith, J. (1997). Occupational Ergonomics: Principles and Applications. Chapman & Hall.
4. Grandjean, E. (1986). Fitting the Task to the Man An Ergonomic Approach. London & Philadelphia: Taylor & Francis.
5. Helander, M. (2005). A guide to human factors and ergonomics. CRC Press.
6. Wickens, C., Gordon, S., & Liu, Y. (1997). An Introduction to Human Factor Engineering. New York: Addison-Wesley Educational Publisher, Inc.
7. Freivalds, A., & Niebel, B. (2013). Niebel's Methods, Standards, & Work **Design.** Mcgraw-Hill higher education.
8. Tarwaka, Solichul HA Bakri, dan Lilik Sudiajeng. 2004. Ergonomi untuk Keselamatan, Kesehatan, dan Produktivitas, Surakarta: Uniba Press
9. Nurmianto, E. Ergonomi: Konsep Dasar dan Aplikasinya. Penerbit Guna Widya. Surabaya. 2004
10. Sritomo Wignjosoebroto. 2003. Ergonomi Studi Gerak dan Waktu, Teknik Analisis Untuk Peningkatan Produktivitas Kerja, Surabaya: Penerbit Guna Widya
11. Suma'mur PK, Higiene Perusahaan dan Kesehatan Kerja, PT Gunung Agung, Jakarta.

SYLLABUS OF UNDERGRADUATE PROGRAM in INDUSTRIAL ENGINEERING

Semester 3

STI302 –Manufacturing Process

Prerequisite(s): Introduction to Industrial Engineering

Material: Machining, Forming and Shaping, Powder Metallurgy, Non-Conventional Machining, Metal Casting Process, Non-Metal Processing, Assembling, Finishing Process, Basic of Automation

References:

1. Serape Kalpak Jian dan Steven R. Schim, 2001. Manufacturing Engineering and Technology, Prentice-Hall. New Jersey
2. E Paul DeGarmo,1997. Materials and Processes in Manufacturing, Prentice Hall Int, Inc. New Jersey
3. John A. Shey, 2009, Proses Manufaktur, Introduction to Manufacturing Processes, Panerbit Andi
4. Pandey, Modern Machining Processes, University of Roorkee, Mc Graw-Hill Publishing Company Limited, New Delhi.

STI303 –Optimization

Prerequisite(s): Linear Algebra

Material: Basic concept of deterministic model and mathematic model, Linear Programming Model & Graphical Solution, Simplex Method, Big-M Method, Duality Theory, Sensitivity Analysis, Transportation Method, Assignment Method

References:

1. Hiller and Liberman, Introduction to Operational Research, 9th Edition, Mc Graw Hill Publishing Company, 2012.
2. Hamdy A Taha, Operation Research an Introduction, 9th Edition, Prentice-Hall, 2010

SYLLABUS OF UNDERGRADUATE PROGRAM in INDUSTRIAL ENGINEERING

Semester 3

STI304 –Statistics 2

Prerequisite(s): Statistics 1

Material: The scope of inference and theoretical statistics distribution, Estimation, Hypothesis Test for one/two parameters of the population with Z distribution/t distribution, Hypothesis test with ANOVA, Hypothesis test without population parameter, Linear Regression and Correlation, Assignment on t-test module, ANOVA, Chi-Square, Linear Regression, and Correlation

References:

1. Fauzy, A. (2008). Statistik Industri. Penerbit Erlangga.
2. Spiegel, M.R., Schiller, J., Srinivasan, R.A. (2002). Schaum's Outlines: Probabilitas dan Statistik. Edisi Kedua. Penerbit Erlangga.
3. Harinaldi. (2005). Prinsip-Prinsip Statistik untuk Teknik dan Sains. Penerbit Erlangga
4. Walpole, R.E. & Myers, R.H. (1995). Ilmu Peluang dan Statistika untuk **Insinyur** dan Ilmuwan. Edisi ke-4. Terjemahan RK. Sembiring, Bandung: Penerbit ITB.
5. UNIDO, Manual for Preparation of Industrial Feasibility Studies, UNIDO, New York, 1991
6. Modul Statistika Industri (2017). Laboratorium Statistik Industri dan Optimasi, FTI ,UII.

STI305 –Cost Analysis and Estimation

Prerequisite(s): Introduction to Economics

Material: Cost Management, Introduction to Accounting and Strategic Decision, Analysis and Cost Grouping, Determination of Production Cost, Order-based Cost Calculation System (Order Costing), Process-based Cost Calculation System (Process Costing), Supply Control, Break-Even Point Analysis, Activity Based Costing/ABC, Cost of quality and accounting for production losses, Financial Report.

References:

1. Cost Accounting, Carter, 14th edition, 2006
2. Erik Ten Brinke. 2002. Costing Support And Cost Control In Manufacturing. A Cost Estimation Tool Applied In The Sheet Metal Domain. Printed by Print-Partners Ipskamp, Enschede, The Netherlands.
3. Gray, J. & D. Ricketts, 1982, "Cost and Managerial Accounting", McGraw-Hill.
4. Horngren, C.T. & G. Foster, 1997, "Cost Accounting: A Managerial Emphasis", Prentice-Hall International.++
5. James, J., 2001, "Managerial Accounting", John Wiley & Sons.

SYLLABUS

Semester 3

STI306 –Production Planning and Control 1

Prerequisite(s): Introduction to Industrial Engineering

Material: Basic concept of manufacturing planning and control system, Material resource planning (MRP II), Basic Forecasting, Data analytics for forecasting, Aggregate planning: aggregate strategy of workforce level, chase strategy, mix strategy, optimization, Master production schedule, MRP, and lot sizing technique, Independent demand ordering system, Rough cut capacity planning: Capacity Planning Using Overall Factors (CPOF), Bill of Labor Approach (BOLA), Resource Profile Approach (RPA), Capacity Requirement Planning

References:

1. Fogarty, D., 1991, Production And Inventory Management 2nd Edition, South-Western Publishing Co., Ohio.
2. Russel, R.S., Taylor III, B.W., 2014, Operation and Supply Chain Management, John Willey and Sons Inc., Singapore.
3. Vollman, T.E., Berry, W.L., Whybark, D.C. and Jacobs, F.R. (2005). Manufacturing planning and control for supply chain management. Fifth edition. McGraw-Hill/Irwin. USA.

STI307 –Physics Laboratory Works

Prerequisite(s): Physics

Material: Electricity heat rate, lense, and bias index, electrical conductivity in wire, the magnetic field of a solenoid, mathematical pendulum, Young's Modulus, or Elastic Modulus.

References:

1. Modul Praktikum Fisika Dasar Prodi Teknik Industri UII, (2021), Laboratorium Fisika Dasar. Universitas Islam Indonesia.

STI308 –Environmental Chemistry

Prerequisite(s): None

Material: Introduction to Environmental Chemistry, Atmospheric Chemistry, Aquatic Chemistry, Geosphere, Marine Chemistry, Environment Toxicology, Environmental Impact Analysis (AMDAL), Green Industry

References:

1. Lichtfouse, Eric, Schwarzbauer, Jan, Robert, Didier, 2021, Environmental Chemistry for a Sustainable World, Springer Press
2. Guibin JiangXiangdong Li, 2020, A New Paradigm for Environmental Chemistry and Toxicology, Springer Nature Switzerland AG
3. Manahan, S. E., 2000, Environmental Science, Technology and Chemistry, Boca Raton: CRC Press LLC
4. Andrews, J.E., Brimblecombe, P., Jickells, T.D., Liss, P.S., Reid, B., 2004, An Introduction to Environmental Chemistry, Oxford, UK: Blackwell Publishing
5. Jones, J.C., 2008, Atmospheric Pollution, Ventus Publishing Aps
6. Potter, C., Soeparwadi, M., Gani., 1994, Limbah Cair Berbagai Industri di Indonesia (Sumber, Pengendalian dan Baku Mutu), Project of The Ministry State for Environment Republic of Indonesia and Dalhousie University Canada

SYLLABUS

Semester 4

STI401 –Stochastic Model

Prerequisite(s): None

Material: Decision making in risky and uncertain conditions, Decision making in competitiveness, random process, Markov Chain, Queueing Theory

References:

1. Hamdy A Taha, Operation Research an Introduction, 8th Pearson Prentice Hall, 2007.
2. Hillier dan Lieberman, Introduction to Operations Research, 8th, McGraw-Hill Publ. Co., 2005.
3. Wayne L. Winston, Operation Research Applications and Algorithm, 4th, Thomson, 2004

STI402 –Engineering Economics

Prerequisite(s): Cost Analysis and Estimation

Material: Basic concept of engineering economics, concept and terminology of cost as well as determination method of production cost, the value of money time to time, The determination of investment alternatives and planning horizon, estimation of cash flow and MARR, The methods of comparing the investment alternatives, supplement analysis, Accounting depreciation, Depreciation method and taxing, Basic concept of replacement analysis, Basic of capital budgeting

References:

1. Blank T.L., & Tarquin A., 2004. Engineering Economy, 6th Edition, McGraw-Hill Book Co Singapore.
2. White J.A. et al., 2009. Principles of Engineering Economic Analysis, 5th Edition, John Wiley and Sons Singapore
3. Pujawan, I.N., 2009. Ekonomi Teknik, Edisi Kedua, Guna Widya Surabaya.

SYLLABUS

Semester 4

STI403 –Work System Design & Ergonomics

Prerequisite(s): Work Method and Measurement

Material: The introduction to WSDE, Anthropometry, Usability analysis, Work system design, motion economy, Tool Design & Design Control, Cognitive design and display, Manual Material Handling, Design of physical work environment, Work stress management, Work shift

References:

1. Bridger: Introduction to Ergonomics
2. Grandjean, E. (1986). Fitting the Task to the Man An Ergonomic Approach. London & Philadelphia: Taylor & Francis.
3. Tayyari, F., & Smith, J. (1997). Occupational Ergonomics: Principles and Applications. Chapman & Hall.
4. Kroemer, K., Kroemer, H., & Kroemer-ELbert, K. (1994). Ergonomics How to Design for Ease and Efficiency. Englewood Cliffs, New Jersey: Simon & Schuster Company.
5. Philips: Human Factor Engineering
6. Sanders and McCormick: Human factor in Engineering Design
7. Wickens, C., Gordon, S., & Liu, Y. (1997). An Introduction to Human Factor Engineering. New York: Addison-Wesley Educational Publisher, Inc.
8. Modul Tutorial

STI404 –Data Base Management System

Prerequisite(s): Programming Logic

Material: Concept of Database, Components, and database architecture, Database design for UML modeling, Conceptual Data Model and Physical Data Model, the Form and Criteria of Normal Data, Data Normalization, The Introduction to Database Management, Data Definition Language (DDL), and Data Manipulation Language (DML), Query Function

References:

1. Jeffrey A.Hoffer, et all, Modern Systems Analysis and Design, 4th ed., New Jersey, Pearson Prentice Hall.
2. Ramakrishnan, Raghu & Gehrke, Johannes, Database Management System: Third Edition, McGraw-Hill Companies Inc, 2003.
3. Reingruber, Michael C & Gregory, William W, The Data Modelling Handbook: A BestPractice Approach to Building Quality Data Model, John Wiley & Son Inc, 2001.
4. Fathansyah, Basis Data: Revisi Kedua, Informatika Bandung, 2015.

STI405 –Quality Control and Assurance

Prerequisite(s): Statistics 2

Material: The Concept of Quality and Quality Management. Tools in Quality Management (7 Tools), Acceptance Sampling, Six Sigma, Failure Mode Effect Analysis, ISO 9000-based Quality Assurance

References:

1. Besterfield, Dale H., Quality Control (8th Edition), Prentice-Hall, 2008

SYLLABUS

Semester 4

STI406 –System Modeling

Prerequisite(s): Optimization

Material: Definition, Characteristics, Model Objective, System Characteristics, Systems Thinking, System Characteristics: Problem Elements, Stakeholder Analysis, Definition of Problem Concept, Mathematical Model, Parameter Estimation, Model Finishing, Model Validation, and Verification

References:

1. Daellenbach, H.G., Systems and Decision Making, John Wiley&Sons, Chichester-England, 1995
2. Simatupang, T.M. Pemodelan Sistem. Studio Manajemen, Jurusan Teknik Industri, ITB. 1994
3. Murthy, D., N., P. Mathematical Modeling: A Tool for Problem Solving in Engineering, Biological, and Social Science. Oxfort, England : Pergamon Press. 1990.

STI407 –Production Planning and Control 2

Prerequisite(s): Production Planning and Control 1

Material: Scheduling: flow shop, job shop; Assembly line balancing; Input/output control; Theory of constrains: Philosophy, shifting bottleneck scheduling (case study in MSE); Computer-aided process planning; FMS; cellular manufacturing; JIT; Flexible lean system; Sustainable manufacturing

References:

1. Fogarty, D., (1991). Production And Inventory Management 2nd Edition, South-Western Publishing Co., Ohio.
2. Gu, P., and Norrie, D.H. (1995). Intelligent Manufacturing Planning. Chapman & Hall.
3. Vollman, T.E., Berry, W.L., Whybark, D.C. and Jacobs, F.R. (2005). Manufacturing planning and control for supply chain management. Fifth edition. McGraw-Hill/Irwin. USA.
4. Pampaneli.A., Trivedi.N., Found.P. (2016). The Green Factory: Creating Lean and Sustainable Manufacturing. US. CRC Press.

STI408 –Industrial Psychology

Prerequisite(s): None

Material: Introduction to Industrial Psychology and Organization; Psychological Research and Assessment; Work Condition and Engineering Psychology; Position Analysis; Recruitment; Selection and Placement; Training and Human Resource Development; Leadership in Organization; Communication in Work Environment; Work Motivation and Work Satisfaction; Work Stress Management

References:

1. Hugh Coolican, H. 2014. Research Methods and Statistics in Psychology, sixth edition, Psychology Pres
2. Ivancevich, J.M. & Konopaske, R. 2013. Human Resource Management. Twelfth Edition. McGraw-Hill Irwin.
3. Riggio, R.E., 2013, Introduction To Industrial/ Organizational Psychology Sixth Edition, Pearson

SYLLABUS

Semester 5

UNI605 –Sharia Entrepreneurship

Prerequisite(s): None

Material: Management of Interest in Entrepreneurship, Entrepreneurship in Islam Perspective, Ethics and Law in Sharia Business, Business Feasibility Analysis, Business Model Canvas.

References:

1. Moh. Mufid (2015), Kaidah Fiqh Ekonomi Syariah : Teori dan Aplikasi Praktis
2. Mustafa Kamal Rokan (2013), Bisnis ala Nabi : Teladan Rasulullah SAW dalam Berbisnis, Penerbit Bunyan
3. Abdullah, Ma'ruf (2012). Wirausaha Berbasis Syari'ah, Cetakan I, Yogyakarta: Aswaja Pressindo
4. Abdurrahman, N.H. (2013). Manajemen Bisnis Syari'ah dan Kewirausahaan. Edisi Pertama. Bandung: CV. References Setia

STI501 –Decision Analysis & Data Mining

Prerequisite(s): Optimization

Material: Definition of Decision Analysis and Data Mining, Decision Determination in various situation, Multi-Criteria Decision Making: SAW, TOPSIS, AHP, and ANP, Clustering Analysis, Association Rule–Market Basket Analysis, Classification Analysis

References:

1. Triantaphyllou Evangelos, Multi-Criteria Decision Making Methods: A Comparative Study Kluwer Academic Publisher, 2010.
2. Saaty L Thomas, Decision Making for Leaders, RWS Publication, 2012.
3. Larose T Daniel, Larose D Chantal, Data Mining and Predictive Analytics (Wiley Series on Methods and Applications in Data Mining), Jhon Wiley&Sons, 2015

STI502 –Occupational Safety and Health (OSH)

Prerequisite(s): Environmental Chemistry

Material: Basic Concept and Introduction to OSH; General Risk Assessment/Risk Assessment; Basic Law on OSH and Safety Methodology, Hierarchy of Control; Accident causation and Investigation, Job Safety Analysis; Accident Model; PPE; Safety and psychology; Cost/Benefit Analysis; Occupational Health and Safety Management System OHSMS/SMK3; Overal Design and Safety Precaution/Procedure.

SYLLABUS

Semester 5

References:
1. Ferrett, E. (2015). Health and Safety at Work Revision Guide: For the NEBOSH National General Certificate in Occupational Health and Safety. Routledge.
2. Covan, James. (1995). Safety Engineering, Wiley Series in New Dimensions in Engineering, New York, NY.
3. Ashfal, C. Ray. (1995). Industrial Safety and Health Management, 3rd edition. Prentice-Hall, New Jersey
4. Wickens C. et al: An Introduction to Human Factor Engineering
5. Hammer, Occupational Safety Management and Engineering, Prentice-Hall, New Jersey
6. Kumar, S. Advanced in Occupational Ergonomics and Safety, IOS Press, 1998
7. Reese, C.D. Et al (2006): Handbook of OSHA Construction Safety and Health, 2nd edition. Taylor & Francis
8. Grantham, David. Occupational Health and Hygiene Guidebook for the WHSO, Merino Lithographics, Mooroka.
9. All books and references about OSH are listed in UII's library and Laboratory of DSK&E
10. Journals of OSH

STI503 –Productivity Engineering

Prerequisite(s): Quality Control and Assurance

Material: Concept and Cycle of Productivity, Industry, National and International-Level Productivity Measurement, Productivity Measurement in company or organization, Total Productivity Model, Short and Long-Term Productivity Planning Model, Concept of Productivity Improvement.

References:
1. Sumanth, D.J. (1984). Productivity Engineering and Management. Productivity Measurement, Evaluation, Planning, and Improvement in Manufacturing and Service Organizations. McGraw-Hill Book Company.
2. Sinulingga, Sukaria, (2014), Rekayasa produktivitas, USU Press
3. International Labour Organization, (2015), people and productivity, Switzerland

STI504 –Intelligent System

Prerequisite(s): Optimization

Material: Introduction to Intelligent System, Rule-Based Expert System, Frame-Based Expert System, Uncertainty in Expert System, Fuzzy Logic, Artificial Neural Network, Genetic Algorithm

References:
1. Negnevitsky, Michael (2004), Artificial Intelligence – A Guide to Intelligent Systems (Second Edition), Harlow, UK, Addison Wesley, ISBN: 0321204662
2. Kusumadewi, Sri (2002), Analisis dan Desain Sistem Fuzzy Menggunakan Tool Box Matlab, Graha Ilmu, Yogyakarta
3. Kusumadewi, Sri (2003), Artificial Intelligence, Graha Ilmu, Yogyakarta

SYLLABUS

Semester 5

STI505 –Industrial Organization Design

Prerequisite(s): Industrial Psychology

Material: Theory of Industrial Organization and its History, The Correlation of Industrial Organization with Environment, The Basic Principles of Industrial Organization Design, The Design of Industrial Organization Structure, Industrial Organization Culture, Design Thinking, The Dynamics in Industrial Competition, Operationalization of the Strategy, Organization Vision and Mission Formulation, SWOT Analysis, The Formulation of SOP, Business Model Canvas

References:

1. Gareth, J. R., 2010, Organizational Theory: Text and Cases. Sixth Edition, New Jersey, Prentice-Hall Inc.
2. Slack, N. & Lewis, M. 2015. Operations Strategy. Fourth Edition. Pearson Education Limited
3. Osterwalder, A., Pigneur, Y. (2014). Business model generation. Jakarta: Elex Media Komputindo.
4. Agus Mansur, Buku Ajar Desain Organisasi, UII Press, 2020.

STI506 –Project Management

Prerequisite(s): Engineering Economics

Material: Overview Project and Project Management, Project integration management, Project Scope management, Project Schedule Management, Project Cost Management, Project Risk Management, Project Resource Management, Project Stakeholder Management, Project Procurement Management, Project Quality Management, Project Communication Management

References:

1. Project Management Body of Knowledge (PMBOK) 6th Edition, 2017
2. Harold Kerzner, Project Management: A Systems Approach to Planning, Scheduling, and
3. Controlling 12th Edition, Wiley, 2017.

STI507 –Product Design

Prerequisite(s): Work System Design & Ergonomics

Material: Identification Method on Voice of Customer, Method of Product Planning: Quality Function Deployment (QFD), Product Architecture: Concept and Type of Process in Product Architecture, Ergonomics Aspect in Product Design, Usability, Method of Product Design: Kansei Engineering, Design for Manufacturing/Design for Assembly (DFMA). Prototyping: Concept, Method and Process, Application of Product Design and Development in Industry

SYLLABUS

Semester 5

References:

1. Ulrich, K, T, & Eppinger, S.D, 1995, Product Design and Development, Mc Graw-Hill, Singapore Otto, K, N dan Wood, K, L, 2001, Product Design; Technique in Reverse Engineering and New Product Development, Prentice-Hall, New Jersey, USA
2. Kroemer, K., Kroemer, H., & Kroemer-ELbert, K. (1994). Ergonomics How to Design for Ease and Efficiency. Englewood Cliffs, New Jersey: Simon & Schuster Company.
3. Helander, M. (2005). A guide to human factors and ergonomics. CRC Press.
4. Wickens, C., Gordon, S., & Liu, Y. (1997). An Introduction to Human Factor Engineering. New York: Addison-Wesley Educational Publisher, Inc.
5. Norman, D. (2013). The design of everyday things: Revised and expanded edition. Basic books.

STI508 –Management Information System

Prerequisite(s): Data Base Management System

Material: Introduction to MIS; Internet Connection; Basic Concept MIS, Data management and knowledge; Decision Support System, Artificial Intelligence; E-Business and E-Commerce; E-Government; ERP; The Development of Information System, Social Issues, and Legal of Information Technology

References:

1. Martin, E. W., Brown, C. V., DeHayes, D. W., Hoffer, J. A., Perkins, W. C. (2005) Managing Information Technology. New Jersey: Pearson Prentice Hall. (Utama)
2. O'Brien, J. A. (2002) Management Information Systems: Managing Information Technology in the E-Business Enterprise. 5th Ed, McGraw-Hill Atmel Corp, Data Sheet

SYLLABUS

Semester 6

STI601 –Facility Layout Design

Prerequisite(s): Production Planning and Control 1

Material: Introduction to Facility Layout Design; Basic Concept of Facility Design Scheme: Global Site Location, Supra-Space Plan, Macro-Space Plan, Micro-Space Plan, Sub-Micro-Space; Concept of Facility Planning; The Determination of Location; Types of Facility Layout and Material Flow Patter; Production Facility Layout Design: Product Analysis (AC, OPC) and Calculation of Material Requirements; Production Facility Layout Design: Process Analysis (Route Sheet, MPPC) and Calculation of Machines Requirement; Storage System; Non-Production Facility Layout Design; Organization Structure and Human Resource, Activity Relationship Chart (ARC), Activity Relationship Diagram (ARD); Design of Material Transporting System; Type of Material Handling, From to Chart, The Calculation of Material Handling Cost; Mathematical Model for Facility Issues; Basic Algorithm and Advanced Algorithm for Layout Problems; Heuristic Model for Layout Problem, Computer-Aided Layout Design; Design of Manufacturing Cell System; group technology and Facility Layout, Example of Group Technology Implementation in Manufacturing System; Analysis of Material Transportation Distance and Transportation Cost; Application of Facility Layout Design in Industrial Cases

References:

1. Heragu, S., 1997, Facilities Design, PWS Publishing Company, Boston.

STI602 –Enterprise Resource Planning

Prerequisite(s): Production Planning and Control 1

Material: The Concept of ERP, ERP for Sales & Distribution, ERP for Material Management, ERP for Production Planning, ERP for Financial Accounting, ERP for Controlling, ERP for Human Capital Management, Software SAP S/4 HANA

References:

1. Monk, E., Wagner, B., Concept in Enterprise Resource Planning 4th Edition, USA: Cengage Learning.
2. Weidner, S., Koch, B., Bernhardt, C, SAP ERP Global Bike Inc. Ver.2.40, SAP SE, 2015.
3. Widjaya, I.K., Enterprise Resource Planning, Yogyakarta: Graha Ilmu, 2012

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Semester 6

STI603 –Enterprise Analysis and Design

Prerequisite(s): Engineering Economics

Material: Project's Feasibility Study, Function and Scope: Market Aspect and Marketing: Product Life Cycle, Numbers and Composition of Product's Demand: Market Aspect and Marketing: Projection of Demands, Competitiveness Factor, Government's Role: Market Aspect and Marketing: The Utilization of Software in the Determination of Marketing Projection; Technical Aspect and Technologies: The Determination of Capacity the Volume of Economic Production, Technology Selection: Technical Aspect and Technology: Raw Material, Supporting and Additional Materials, Environmental Impact Assessment (EIA/AMDAL), Location of Project and Company's Location, Management Aspect: Project Management; Management Aspect: Project Operational Management; Aspect of Economy and Financial: Project's Budgeting; Aspect of Economy and Financial: The Source of Project's Funding; Aspect of Economy and Financial: Financial Evaluation (Financial Obligation, The Ability to Make Profit); Aspect of Economy and Financial: Financial Evaluation (Method of Financial Feasibility Assessment); Aspect of Economy and Financial: Sensitivity Study and the Project's benefits in Economy and Social; The Instruction and the Project Feasibility Report

References:

1. Chandra, P. (2000) Project: Preparation, Appraisal, Implementation. New Delhi: Tata McGraw Hill
2. Husnan, S., & Suwarsono. (1994). STUDI KELAYAKAN PROYEK. Yogyakarta: AMP YKPN
3. Behrens W dan P. M. Hawranek. (1991). Manual for The Preparation of Industrial Feasibility Studies. Vienna: United Nations Industrial Development Organizations, Vienna.

STI604 –Integrated Industrial System Design

Prerequisite(s): Production Planning and Control 2

Material: Company's Vision and Mission – SWOT Analysis: Market research and Business Model Canvas; Product's Design and Production Process; Prototyping; Cost Strategy (Production Cost and Selling); Marketing Strategy, Market Segmentation, Digital Marketing, Pitching Business and Investment Analysis

References:

1. Christopher K. Bart, (2002) Product Innovation Charter: Mission Statement for New product. R & D Management 32.
2. David, Fred R. (2011) Strategic Management Concept and Cases. Thirteen Edition. Pearson. New Jersey.
3. Heragu, S. S. (2008) Facilities design. CRC Press.
4. Kotler, Philip & Kevin Lane Keller. (2012) Marketing Management 13. New Jersey: Pearson Prentice Hall, Inc.
5. Penman, S.H., (2013) Financial Statement Analysis and Security Valuation 5th Edition. Singapore: Mc Graw-Hill.
6. Rubin, J., & Chisnell, D. (2008) Handbook of usability testing: how to plan, design and conduct effective tests. John Wiley & Sons.
7. Ulrich, K. T. (2003) Product design and development. Tata McGraw-Hill Education.

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Semester 6

STI605 –Computer Simulation

Prerequisite(s): System Modeling

Material: 1. System thinking includes a basic definition of the phenomenon, perspective, and structure that builds the phenomenon. 2. Introduction to System, Model, and Discrete System Simulation Methodology. 3. Concept and Technique of Random Number Generator. 4. Modeling Input. 5. Establishing Model Credibility (Verification, Validation, and Replication). 6. The Selection of The Best Design of Experiment. 7. The Introduction of Dynamics System Simulation

References:

1. Banks, Jerry., Carson II, John S., Nicol, David M., Nelson, Barry L., Discrete-Event System Simulation, 5th Edition, Prentice-Hall, 2010.
2. Sterman, John.,Business Dynamics: Systems Thinking and Modeling for a Complex World, McGraw-Hill, 2000.

STI606 –Basic Research Methodology

Prerequisite(s): Scientific Writing

Material: 1. Definition and Types of Research 2. Research in Industrial Engineering 3. Research Topics 4. SOTA (State of the Art) 5. The technique of Proposal Composing 6. Technique of Presentation

References:

1. Cousin, G. 2009. Researching learning in higher education: an introduction to contemporary methods and approaches staff and educational development series. Taylor & Francis Routledge. The UK.
2. Dawson, C. 2002. Practical research method: a user-friendly guide to mastering research techniques and projects. How-to books, Ltd. United Kingdom

STI607 –Supply Chain Management

Prerequisite(s): Production Planning and Control 1

Material: Basic Concept of SCM, Bullwhip Effect in SCM, Distribution requirement Planning (DRP), Inventory management 5. Procurement Management, Warehouse management, Information Technology in SCM and E-Commerce, The Measurement of SCM Performance

References:

1. Designing And Managing The Supply Chain, David Simchi Levi, et all, Mc Graw Hill, 2000.
2. Supply Chain Management: Strategy, Planning, and operation, Sunil Chopra, Peter Meindel, 2001, New Jersey Prentice-Hall, Inc
3. Pujawan, I N. (2017). Supply Chain Management. 3 rd Edition, Penerbit Andi.

SYLLABUS

Semester 7

UNI602 –Islam Rahmatan lil Alamin

Prerequisite(s): None

Material: The Concept of rahmatan lil alamin, Thematic: Islam in Disciplines, Problem in Contemporary Society

References:

1. Tim Penyusun (2016), Pendidikan Agama Islam untuk Perguruan Tinggi, Dirjen Pembelajaran dan Kemahasiswaan Kemenristekdikti RI, dapat diakses melalui tautan https://belmawa.ristekdikti.go.id/2016/12/09/surat-edaran-bahan-ajar-mata-kuliah-wajib-umum
2. Fazlur Rahman, (1985). Islam dan Modernitas, Tentang Tranformasi Intelektual.
3. Fazlur Rahman, Islam, terj. Ahsin Muhammad. References Bandung.
4. Nurcholish Madjid, Islam Doktrin dan Peradaban
5. Quraish Shihab, Membumikan Al-Quran
6. Hamim Ilyas, Fikih Akbar : Prinsip-prinsip Teologis Islam Rahmatan lil 'Alamin
7. Kuntowijaya, Islam sebagai Ilmu
8. Buku Islam dan disiplin ilmu yang diterbitkan BPA UII
9. Balitbang Kemenag RI, Tafsir Ma'udhui (Tafsir Al-Qur'an Tematik). 11 jilid (Jilid 1, Al-Quran dan Kebinekaan, Jilid 2 Tanggung jawab Sosial, jilid 7 AL-Quran dan isu-isu Kontemporer, jilid 8 Moderasi Islam), PT Lentera Ilmu Makrifat, 2019
10. Nasarudin Umar, Geliat Islam di Negeri Non Muslim, Jakarta: References Alvabet, 2019
11. . Prof. Hasan Asari, Sejarah Islam Modern, Medan: Perdana Publishing, 2019
12. Oni Sahroni, Fikih Muamalah Kontemporer, Jakarta: Republika Penerbit, 2019
13. Ahsin Sakho Muhammad (Ketua Editor), Ensiklopedi Kemukjizatan Ilmiah dalam Al-Quran dan Sunnah, 8 jilid, terjemah dari Yusuf AL-Hajj Ahmad, Mausu'ah al-I'jaz al-'Ilmy fi al-Quran al-Karim wa as-Sunnah al-Muthahharah. PT Kharisma Ilmu
14. Zakir Naik dkk, The Qur'an & Modern Science/ Miracle of Al-Qur'an dan As-Sunnah, Solo: Aqwam Media, Cet. V, 2017
15. Melacak Teori Einstein dalam Al-Qur'an, Jogja: References Pelajar
16. Agus Purwanto, Ayat-Ayat Semesta, edisi II, cet 3, Bandung: Mizan, 2017
17. Nadirsyah Hosen, Tafsir Al-Quran di Medsos: Mengkaji Makna dan Rahasia Ayat Suci pada Era Media Sosial, Yogyakarta: Bentang References, 2017
18. Muhammad al-Ghazali, Jaddid Hayatak, Segarkan Hidupmu (terjemah), Jakarta: Zaman, 2015

SYLLABUS

Semester 7

UNI604 –Civic Education

Prerequisite(s): None

Material: Civic knowledge: The knowledge about citizenship, Civic Skills: Intelectual Skill and citizen participation, Civic Disposition: Citizenship Character, Private and Public

References:

1. Tim Penyusun (2016), Pendidikan Kewarganegaraan untuk Perguruan Tinggi, Dirjen Pembelajaran dan Kemahasiswaan Kemenristekdikti RI
2. Sabirin Mailan dan Suparman Marzuki (2003), Pendidikan kewarganegaraan dan hak asasi manusia, UII Press

UNI608 –Community Service

Prerequisite(s): >100 Credits, GPA>2,25

Material: Services to Community, Community's Empowerment

References:

1. Tim Penyusun, 2019, Pedoman Penyelenggaraan Kuliah Kerja Nyata, Pusat KKN Direktorat Penelitian dan Pengabdian Masyarakat Universitas Islam Indonesia.

SYLLABUS

Semester 8

STI801 –Undergraduate Thesis

Prerequisite(s): Basic Research Methodology, I Elective Course, Have Conducted or Conducting the Internship, > 120 Credits

Material: Literature Study, The Method in Research/Design, Application of Science, Industrial Engineering, Academic Writing, Scientific Communication

References:

1. Tim Penyusun, (2021) Buku Panduan Tugas Akhir, Prodi Teknik Industri, Universitas Islam Indonesia.

STI802 –Internship

Prerequisite(s): Basic Research Methodology, Student Soft Skills Development

Material: Professional Ethics, Scientific Communication, Academic Writing, Application of Industrial Engineering Discipline

References:

1. Tim Penyusun, (2021) Buku Panduan Kerja Praktek, Prodi Teknik Industri, Universitas Islam Indonesia

ELECTIVE COURSES

Field of Interest: Industrial Management

STI901 –Human Capital Management

Prerequisite(s): Industrial Psychology

Material: 1. Concept of Human Capital 2. Concept of Human Capital Management 3. Managing and Measuring Human Capital 4. Human Capital Data 5. HCM Strategy 6. HCM Measurement (KPI) 7. HCM Benchmarking 8. HCM Implementation 9. Human Capital Reporting: Internal Reporting and External Development

References:

1. John Ingham, 2008, Strategic Human Capital Management, Butterworth-Heinemann is an imprint of Elsevier
2. Bill Curtis, 2010, CMM: A Framework of Human Capital, Addison Willey.
3. Angela Baron and Michael Armstrong, 2007, Strategic Human Capital Management: Creating Adding Value Through People, Kogan Page, Philadelphia

STI902 –Strategic Management

Prerequisite(s): Industrial Organization Design

Material: 1. Introduction to Strategic Management 2. Strategic Formulation 3. External and Internal Assessment 4. Strategic in Action 5. Analysis and Strategy Selection 6. Implementing Strategies 7. Strategy Review, Evaluation, and Control 8. Business Ethics, Social Responsibility and Environmental Sustainability 9. Global and International Issues

References:

1. David, Fred R. (2010). Strategic Management: A Competitive Advantage Approach, Concepts, and Cases (13th Edition). London: Prentice-Hall International.

STI903 – Knowledge Management

Prerequisite(s): Management Information System

Material: 1. Introduction to Knowledge Management 2. Managing Knowledge Worker 3. Barriers to Knowledge Management 4. Resource-Based Strategy for Knowledge Management 5. Knowledge as a Strategic Resource 6. Value Configurations for Business Organizations 7. IS/IT in Knowledge Management Process 8. Stages of Growth in Knowledge Management Technology 9. IS/IT Strategy for Knowledge Management

References:

1. Petter Gottschalk, 2005, Strategic Knowledge Management Technology, Idea Publishing.
2. Peter Gray, 2000, A Problem Solving Perspective on Knowledge Management, Queen's Management Research Centre for Knowledge-Based Enterprises.

ELECTIVE COURSES

Field of Interest: Industrial Management

STI904 –Technology Management

Prerequisite(s): Production Planning and Control 1

Material: 1. Basic Concept of Technology Management 2. Integration of Technology Strategy 3. Identification of Technology Requirement 4. Model of Technology Audit 5. Technology Forecasting 6. Technology Management Life-Cycle 7. The strategy of Value Link

References:

1. Khalil, Tarek. (2000), Management of Technology, The Key to Competitiveness and Wealth Creation. New York: McGraw-Hill
2. Dussauge, Pierre; Hart, Stuart and Ramanantsoa, Bernard (1997) Strategic Technology Management, John Wiley & Sons, Inc
3. GTZ, Value Link Modul, GTZ Germany, 2015

STI905 –Risk Management

Prerequisite(s): Engineering Economics

Material: 1. Basic Concept of Risk Management 2. Risk identification 3. Enterprise Risk Management 4. Risk Measurement: Qualitative and Quantitative Approach 5. Evaluation of Risk Mapping 6. Risk Responses 7. Risk Monitoring and Review

References:

1. LSPMR, Certified Risk Management Officer (CRMO) Handbook, 2017.
2. Crouhy, Michael, The Essentials of Risk Management, Second Edition, McGraw-Hill Education, 2014.
3. Kountur, R. (2016). Cara Mudah Asesmen Risiko Terintegrasi Quantitative Approach. Jakarta: RAP risk advisory & performance.
4. ISO 31000: 2009 Principle and Guideline.

STI907 –Asset Management

Prerequisite(s): Production Planning and Control 1

Material: Introduction to Asset Management; Fundamentals of Asset Management; Stapping with the right foo; Asset Management Conceptual Model; Asset Management System, Strategy, Process, and Organization; Maintenance Management and Strategy; Aligning Maintenance and Business strategy; Decision Making in Asset Management; Framework for Optimizing Maintenance Strategy; Life Cycle Cost Estimation, Model and Application; ISO 55000 for Asset Management System; Asset Management Maturity Model; Asset Related Risk Management

References:

1. Campbell, J.D., Jardine, A.K.S., McGlynn, J. (2011), ASSET MANAGEMENT EXCELLENCE Optimizing Equipment Life-Cycle Decisions, CRC Press is an imprint of Taylor & Francis Group, ISBN: 13: 978-0-8493-0324-1.
2. The Institute of Asset Management (2015), Asset Management – An Anatomy, The IAM, London, UK.

ELECTIVE COURSES

Field of Interest: Industrial Management

STI908 –Service Management

Prerequisite(s): Quality Control and Assurance

Material: Definition and Objective of Service Management, Types of Services, Issues in Services, Strategy in Service Design, Service Delivery System, Quality Perspective, Determinants of Service Quality, Excellent Service, The Measurement of Service Quality, The Measurement of Customers' Satisfaction, Service Offering Management, Service Request Management

References:

1. Fitzsimmons, J.A. & Mona J.F., 2005. Service Management: Operations, Strategy, and Information Technology, 5rd Edition. McGraw-Hill Publishing Company.
2. Fitzsimmons, J.A. & Mona J.F., 1982. Service Management for Competitive Advantage, McGraw-Hill Publishing Company.
3. Tjiptono F., 2012. Service Management: Mewujudkan Layanan Prima. Penerbit Andi Yogyakarta.

STI909 –Decision Support System

Prerequisite(s): Management Information System

Material: Business Development and the Requirements on Decision Support System (DSS), Basic Concept of Decision Making, Decision Support System (DSS), Data Management Sub-System (DBMS) Model Management Sub-System (MBMS), Basic Analytic Modeling for Decision Making, Advanced Analytic Model for Decision Making, Group Decision Support System (Group DSS), Warehouse Data and Business Intelligence for DSS, Knowledge Management for DSS, Intelligent System for DSS, Executive Information System, and Management of Business Performance, Development, and acquisition of DSS Application

References:

1. Efraim Turban et.al., 2010, Decision Support Systems and Business Intelligence Systems, New Jersey, Pearson International Edition.

STI910 –Industrial Marketing

Prerequisite(s): Cost Analysis and Estimation

Material: Concept of Industrial Marketing, Industry Buying Behaviour, Industrial Marketing Strategy, Industrial Marketing Plan, Information System and Research in Industrial Marketing, The Determination of Market Segmentation and Market Target, The Determination of Product Position and Product Development, The Planning for Industrial Marketing Channel and Promotion for Industrial Marketing, Industrial Marketing Control, Sharia Marketing, Collaboration Design in Industrial Marketing.

ELECTIVE COURSES

Field of Interest: Industrial Management

References:
1. Subroto B., 2011. Pemasaran Industri (Business to Business Marketing). Penerbit Andi.
2. Kotler P. & Keller L.K., 2012, Marketing Management. Pearson.
3. Dwyer F.R. & Tanner J.F., 2006. Business Marketing: Connecting Strategy, Relationship, and Learning. McGraw-Hill.
4. Chaffey D. & Chadwick F.E., 2016. Digital Marketing: Strategy, Implementation, and Practice. Pearson.
5. Qurtubi, 2017. Buku Ajar Pemasaran Industri. Penerbit UII.

STI911 –Analysis and Design in MIS

Prerequisite(s): Data Base Management System

Material: 1. Definition of System and System Analysis 2. System Analysis 3. General System Design 4. Structured Design Approach 5. Data Flow Diagram (DFD) 6. Detailed System Design (Output and Input) 7. Detailed System Design (Database) 8. Object-Oriented System Planning Approach 9. The Design of Object-Oriented System Using UML (Unified Modeling Language) 10. Discussion on Assignment by Using Analysis Model/Tool and System Design

References:
1. Burch, J.G., System, Analysis, Design, and Implementation, Boyd & Fraser Publishing Company, 1992.
2. Whitten, Jeffery L., dkk, Metode Desain & Analisis Sistem, Edisi 6, Mc-Graw Hill Education, 2004
3. Elmasri/Navathe, Fundamentals of Database System, Benjamin/Cummings Publishing Company, Inc, 1989
4. Jogiyanto, Analisis dan Disain Sistem Informasi, ANDI OFFSET Yogyakarta, 1990.
5. Valacich, Joseph S., et.al, Essential of System Analysis and Design, Prentice-Hall, 2001.
6. Ariesto Hadi S., Analisis dan Desain Berorientasi Objek, J&J Learning Yogyakarta, 2002.

STI912 –Business Process Management

Prerequisite(s): Enterprise Resource Planning

Material: 1. Introduction to Business Process Management 2. The Principles of Organization Strategy and Process Design 3. Business Process Maturity 4. Process Documentation by Using Process Mapping Tool 5. Process Modeling (BPMN) 6. Business Process Standardization 7. Process Simulation 8. Identification of Process Improvement 9. Business Process Re-Engineering 10. The Role of Industrial Engineering in Business Process Management 11. Automation Process 12. Business Process Management System

References:
1. Dumas, M., La Rosa, M., Mendling, J., & Reijers, H. A. (2013). Fundamentals of business process management (Vol. 1, p. 2). Heidelberg: Springer.
2. Weske, M. (2007). Business process management architectures. Springer Berlin Heidelberg

ELECTIVE COURSES

Field of Interest: Operational Research

STI914 – Six Sigma

Prerequisite(s): Quality Control and Assurance

Material: 1. Introduction: Definition of Quality, Quality Controlling, Control Factor, Noise Factor, Variation and Defect System 2. Continuous Improvement Concept and Six Sigma (DMAIC—Define, Measure, Analyze, Control) 3 Control Chart and Capability Analysis Process 4. Cause and Effect Analysis 5. Scatter Diagram and Correlation-Regression Analysis 6. Selecting and Implementing Countermeasure 7. Tools in Controlling Process: FMEA (Failure Mode and Effect Analysis) and FMEA case study 8. Implementation of Six Sigma in Service Industry 9. Change Management

References:

1. Gaspersz, V. 2002. Pedoman Implementasi Program Six Sigma Terintegrasi dengan ISO 9001: 2000, MBNQ, dan HACCP. Jakarta: PT. Gramedia References Utama.
2. Gaspersz, V. 1998. Statistical Process Control. Jakarta: PT. Gramedia References Utama.
3. Gaspersz, V. 2005. Total Quality Management. Jakarta: PT Gramedia References Utama.
4. Montgomery, Douglas C. 2001. Introduction to Statistical Quality Control. 4th Edition. New York: John Wiley & Sons, Inc

STI915 –Multivariate Analysis

Prerequisite(s): Statistics 2

Material: The concept of Multivariate Analysis, Regression Analysis, Factor Analysis, Structural Equation Modeling (SEM), Conjoint Analysis

References:

1. Alvin C Rencher, 2002, Methods of Multivariate Analysis, Willey and Son, Canada.
2. Joseph F. Hair Jr. William C. Black Barry J. Babin Rolph E. Anderson, 2014, Multivariate Data Analysis, Pearson, America.

STI916 – Advanced Simulation

Prerequisite(s): Computer Simulation

Material: Modeling Process with Dynamic System, Structure and Behaviour of Dynamic System, Causal Loop Diagram, Software Recognition on Powersim Studio and Flow Diagram Modeling, Constructing The Dashboard for System Dynamics Simulation, Structure Validation, Behaviour, and Policies, Result's Analysis and Scenario Arrangement/"what-if analysis", System Thinking Concept, Generative system thinking, Agent-Based Modeling, ODD Protocols, Verification and Validation of Simulation Model, Netlogo Software

ELECTIVE COURSES

Field of Interest: Operational Research

References:

1. Maani, Kambiz E. & Cavana, Robert Y., Systems Thinking, System Dynamics (2nd Edition), Pearson Education Canada, 2007.
2. Sterman, J. (2002). System Dynamics: Systems Thinking and Modeling for a Complex World.
3. Ailsback, S.F., Grimm, V., Agent-Based and Individual-Based Modeling, Princeton University Press, 2012.
4. North, M.J., Macal, C.M., Managing Business Complexity, Oxford University Press, 2007.

STI918 –Quality Engineering

Prerequisite(s): Quality Control and Assurance

Material: 1. Quality Basic Concept 2. Types of Quality Control 3. Taguchi Concept 4. Taguchi Experiment Design 5. Hypothesis Test: Normality Test, Homogeneity Test, Variance Analysis 6. Method of Taguchi Experiment Optimization 7. Difference Test and Confirmation Experiment

References:

1. Bashiri, M. & Hejazi, T.H. An Extension of Multi-Response Optimization in MADM View. Journal of Applied Sciences, Vol 9, 1695-1702, 2009.
2. Belavendram, N. Quality By Design. Prentice Hall, Internasional. 1995.
3. Phillip J. Ross, Taguchi Techniques for Quality Engineering, 2nd McGraw-Hill, 1996.
4. Roy Ranjit K. Design of Experiment: Using Taguchi Approach, John Wiley & Sons, 2001
5. Tong, L, Chan, C dan Wang C.H., Optimizing of Multi-Response Processes Using the VIKOR Method. Int J Adv. Manufacturing Technology, 2005.

STI919 –Business Intelligence

Prerequisite(s): Decision Analysis & Data Mining

Material: Decision Modeling and Decision Support System; General Description on Business Intelligence: OLAP & data mining; Business Performance Management (BPM); Warehousing: Implementation of Decision Support System by Using BI in a company

References:

1. Turban E, Sharda R, & Delen D, (2011), Decision Support and Business Intelligence Systems, International Edition, 9th edition, Pearson, New Jersey.
2. Turban E, Aronson J.E., & Liang, T.P., (2005), Decision Support Systems and Intelligent Systems, International Edition, Edisi 7, Pearson Prentice-Hall Education International, New Jersey.
3. Shmueli G, Patel N.R, & Bruce P.C., (2010), Data Mining for Business Intelligence Concept, Techniques, Applications in Microsoft Office Excel with XLManner, 2nd Edition, Wiley.
4. Ballard et al. Dimensional Modelling: in a business intelligence environment, 2006.
5. Michalewicz et al. Adaptive business intelligence. 2006. 6. Robert De Levie. Advanced Excel for Scientific Data Analysis. 2004.

ELECTIVE COURSES

Field of Interest: Operational Research

STI950 –Metaheuristic

Prerequisite(s): Stochastic Model

Material: 1. Understanding Basic Concept of Optimization 2. Identifying Optimization Using Metaheuristic Technique 3. Finding the Optimum Value Using GA Technique 4. Finding the Optimum Value with PSO Technique 5. Finding the Optimum Value with TS Technique 6. Finding the Optimum Value with ACO Technique 7. Finding the Optimum Value with SA Technique 8. Utilizing Metaheuristic Techniques in Simple Real Cases

References:

1. Santosa Budi, Willy Paul, Metoda Heuristik, Konsep dan Implementasi, Guna Widya, 2011
2. Santosa Budi, Data Mining Teknik Pemanfaatan Data untuk Keperluan Bisnis, Graha Ilmu, 2012

ELECTIVE COURSES

Field of Interest: Production System

STI921 – Advanced Automation

Prerequisite(s): Programming Logic, Production Planning and Control 2 Arduino Programming 3. NodeMCU Programming 4. Raspberry Programming 5. Web Service Programming 6. Database Real-Time Programming 7. Industrial System and Design and Development 4.0

References:

1. Bradley, D. & Russel, D.W. 2010. Mechatronics in action: case studies in mechatronics – applications and education, London: Springer-Verlag London Limited.
2. Karvinen, K. & Karvinen, T. 2011. Make: Arduino bots and gadgets, Canada: O'Reilly Media, Inc.
3. Richardson, M. & Wallace, S. 2013. Getting started with raspberry pi, Amerika: Matt Richardson and Shawn Wallace.
4. Abeysinghe, S. 2008. Restful PHP web service, Birmingham: Packt Publishing Ltd.

STI922 – Lean and Green Manufacturing

Prerequisite(s): Production Planning and Control 2

Material: 1. Lean manufacturing 2. Production waste 3. Lean Waste Identification Method: VSM and VALSAT, Qualitative Approach 4. Green manufacturing 5. Environmental value stream: green VSM, life cycle assessment (LCA) 6. Lean and green manufacturing: concept, improvement tools, performance 7. Its Application in Industry

References:

1. Nand K Jha. (2016). Green Design and Manufacturing for Sustainability. US. CRC Press.
2. Pampaneli.A., Trivedi.N., Found.P. (2016). The Green Factory: Creating Lean and Sustainable Manufacturing. US. CRC Press.
3. Wilson, L. (2010). How to Implement Lean Manufacturing. US. McGraw-Hill Companies, Inc.

STI923 – Halal Supply Chain Management

Prerequisite(s): Supply Chain Management

Material: 1. Scope in SCM & Halal Logistics 2. Principles and Basic Law in Halal SCM 3. Logistic Control 4. SCM Halal Resources; 5. SCM Halal Business Processes 6. SCM Halal Network Structure 7. Halal Purchasing 8. Halal Warehousing 9. Halal Transportation 10. SCM Halal Performance

References:

1. Principles in halal supply chain management, Tieman et al, Journal of Islamic MarketingVol. 3 No. 3, 2012, pp. 217-243.
2. Frazelle, E.H. (2002), World-Class Warehousing and Material Handling, McGraw-Hill, New York, NY.
3. Principles in halal purchasing, Tieman, M. et al, Journal of Islamic Marketing Vol. 4 No. 3, 2013pp. 281-293

ELECTIVE COURSES

Field of Interest: Production System

STI924 – Intelligent Manufacturing System

Prerequisite(s): Production Planning and Control 2

Material: 1. Intelligent Manufacturing System dan Trend Manufacturing 2021 2. Smart Automation to Smart Manufacturing 3. Industrial Revolution (Industry 1.0, 2.0, 3.0, 4.0) 4. The Comparison of IoT Implementation in Several Countries (ASEAN) 5. Industry 4.0 Paradigm 6. Additive Manufacturing, 3D Printing, Simulation, and Digital Twin, Augmented Reality, Autonomous Robots, Blockchain, Big Data, Cloud Computing. 7. Machine2Machine (M2M), M2M vs IoT 8. IoT/ Industrial Internet of Things (IIoT), IoT vs IIoT, Challenge of IoT, Things in IoT, Strategi Implementasi IIoT 9. Proses Automation dan Lean IIoT 10. IIoT Business Use Case 11. Cloud IIoT

References:

1. Bessis, N. & Dobre, C. (2014). Big data and internet of things: A roadmap for smart environment.
2. Springer International Publishing, Switzerland.
3. Elangovan, U. (2020).Product Lifecycle Management (PLM): A Digital Journey Using Industrial Internet of Things (IIoT). CRC Press.
4. Elangovan, U. (2019).Smart Automation to Smart Manufacturing. CRC Press.

STI925 –Maintenance Management

Prerequisite(s): Production Planning and Control 2

Material: 1. Policy in Maintenance Management and Concept of Maintenance Management: Aspects related to Maintenability, Benefits in Maintenance and Maintenance Techniques 2, Mechanism in Maintenance Documentation, Types of Maintenance Examination, Coordination of Maintenance Work, and Analysis of Result in Maintenance Technique 3. Reliability 4. The Controlling on Active-Time Maintenance, Delay-Time Maintenance, Down Time 5. Maintenance hours factors, Maintenance frequency factors, MTBM, MTBR 6. Supply Support Factors 7. Availability 8. Inventory Model in Maintenance Management 9 Total Productive Maintenance 10. Case Study: OEE 11. Case Study: RCM 1 12. Case Study: RCM II

References:

1. Bloom, N., (2006). Reliability Centered Maintenance: Implementation Made Simple. US. Mc-Graw Hill Inc.
2. Higgins, L.R., Brautigam, D.P., Mobley, R.K. (1995). Maintenance Engineering Hand Book. Fifth edition. USA: Mc Graw Hill, Inc.
3. Mann. L. Maintenance Management. Revised edition. (1994). Lexington, Massachusetts, Toronto: DC Heath and Company.

ELECTIVE COURSES

Field of Interest: Production System

STI926 – Humanitarian Logistics

Prerequisite(s): Supply Chain Management

Material: Concept of Logistics for Humanitarian Assistance, Identification of SCM Risk Scope and Logistics of Humanitarian Assistance, Identifying the Readiness and Challenge in Managing Humanitarian Logistics, Coordinating the Humanitarian Assistance Team, Managing the Information in Handling the Humanitarian Logistics, Knowledge Management in Managing Humanitarian Logistics, Establishing the Successful Partnership in Managing Humanitarian Logistics, Integrating the Industrial Engineering Disciplines in Managing the Humanitarian Logistics

References:

1. Tomasini and Wassenhove, Humanitarian Logistics, Palgrave Macmillan 2009.
2. Lee and Hau, Triple-A Supply Chain, Harvard Business Review, October 2004.
3. Raynard Peter, Mapping accountability in Humanitarian Assistance, ALNAP, 2002 [online] http://www.alnap.org/pubspdfs/praccountability.pdf.
4. Tomasini, Ronaldo and Luk Van Wassenhove, managing Information in Humanitarian Crisis-The UNJLC Website. INSEAD Case Study No. 5218-2005.

STI927 – TRIZ for Product Design

Prerequisite(s): Product Design

Material: The concept of TRIZ and System Innovation, Function Analysis, Analysis of causal-effect chain, 40 inventive principles, Engineering and Physical contradiction, Trimming, Introduction to Several TRIZ Tools: S-Curve Analysis, Environment-Related Patent

References:

1. G.S. Altshuller, (2000). the Innovation Algorithm: TRIZ systematic innovation and technical creativity, Technical Innovation Center.
2. T. S. Yeoh, T.J. Yeoh, & Li, S. C, (2016).TRIZ: systematic Innovation in Manufacturing, First Fluits Publishing Bhd.

ELECTIVE COURSES

Field of Interest: Production System

STI928 –Logistics Management

Prerequisite(s): Production Planning and Control 2

Material: 1. Introduction: Concept of Logistics Management 2. Distribution Management: Design of Distribution Network in Logistics, Distribution Strategy. 3. Selection model for Distribution Location, Network Selection Model, Carrier Selection 4. Transportation Management: Planning, Mode Selection, Transportation Consolidation, Vehicle Routing 5. Logistic service provider (Outsourcing Logistic): 3rd & 4th party logistic. 6. Inventory Management 7. Warehouse management & Material handling 8. Global logistic dan Incoterm 2020 9. IT in logistic: VMI, RFID, WMS, TMS 10. Reverse Logistic 11. Logistic Performance measurement

References:

1. Lambert and Stock, McGraw-Hill, Strategic logistic management,1993
2. Bowersox, Donald J. David J. Closs, Logical Management, The Integrated Supply Chain Process, Mc Graw Hill, New York, 1996
3. Green, Linda L, Logistic Engineering, Jhon Willey & Sons, Inc, London, 1991
4. Blanchard, Benjamin S., Logistic Engineering and Management, Prentice-Hall, Ner Jersey, 1992
5. Frazelle, E.H. (2002), World-Class Warehousing and Material Handling, McGraw-Hill, New York, NY.
6. Modul Sertifikasi CSCP APICS

STI929 –SCM Performance Management

Prerequisite(s): Supply Chain Management

Material: Introduction to performance improvement in SCM; Structure of SCOR 12 Framework; SCOR Performance and metrics: Reliability, Responsiveness, Agility, Cost, Asset management; SCOR Process: Plan, Source, Make, Deliver, Return, Enable; SCOR Practices: Emerging, Best, Standard; SCOR People: Experience, Training; Special Applications: Sustainable SCOR 12; SCOR 12 Racetrack: pre SCOR- Set the Scope- Configure the SC- Optimize project- Ready for Implementation; Implementation of SCOR 12 racetrack in project improvement

References:

1. Hogo, M., Essentials of Supply Chain Management, Fourth Edition, 2018, Published by John Wiley & Sons, Inc., Hoboken, New Jersey
2. SCOR P program, Participant Workbook, APICS, 2017
3. www.apics.org
4. www.ascm.org

ELECTIVE COURSES

Field of Interest: Ergonomics

STI930 - Human-Computer Interaction

Prerequisite(s): Work System Design & Ergonomics

Material: Compounding Components and the Function of Computer Set; How the Computer's Input and Output Work; Evolution of Computer Set; Human Information Processing; Aspek cognitive, psychomotor, affective; Human's sensor limitation; Interaction Mechanism; Model of Interaction; Style of Interaction in Computer System; Process and Stages of Design: Scenario of Interaction; Design and Layout; Persona; Task Analysis & Task Flow; Sitemap/Screenflow; Wireframing and Prototyping; Good Design – Bad Design; Usability Standard; Usability Evaluation Method; Usability Report; Experiment Design and Analysis in HCI: Usability Evaluation Simulation; Information/Data Visualization; User Experience

References:

1. Albert, W., & Tullis, T. (2013). Measuring the user experience: collecting, analyzing, and presenting usability metrics. Newnes.
2. Dix, A., Finlay, J., Abowd, G., and Beale, R. (2004). Human-Computer Interaction (Third Edition). Prentice-Hall, London.
3. Lazar, J., Feng, J.H., & Hochheiser, H. (2010). Research methods in human-computer interaction. John Wiley & Sons.
4. Rubin, J., & Chisnell, D. (2008). Handbook of usability testing: how to plan, design and conduct effective test. John Wiley & Sons.

STI931 - Human-Machine System

Prerequisite(s): Work System Design & Ergonomics

Material: 1. Manual man-machine system 2. Semi-automatic man-machine system 3. Automatic man-machine system 4. Lingkungan Kerja Fisik 5. Faktor manusia dan system 6. Methodology of Ergonomics Research 7. Information Input System 8. Display visual 9. User Interface 10. Work System and Control for Human 11. Work Activities and Motor Skills

References:

1. Eko Nurmianto. Ergonomi Konsep Dasar dan Aplikasinya. Surabaya: Guna Widya
2. Sritomo Wignyosoebroto. Ergonomi, Studi Gerak dan Waktu. Surabaya: Guna Widya
3. Dix, Alan et.al, Human-Computer Interaction, Prentice-Hall, Europe, 1993.
4. Galitz, W.O., The Essential Guide to User Interface Design: An Introduction to GUI Design, Principles, and Techniques, John Wiley & Sons, Canada, 1996.
5. Johnson, P., Human-Computer Interaction: Psychology, Task Analysis and Software Engineering, McGraw-Hill, England UK, 1992.
6. Newman, W.M and Lamming, M.G., Interactive System Design, Addison Wesley, Cambridge, GREAT Britan, 1995.
7. P. Insap Santoso, Interaksi Manusia dan Komputer : Teori dan Praktek, Andi Offset, Yogyakarta, 1997
8. Sutcliffe, A.G., Human-Computer Interface design, 2nd Edition, McMillan, London, 1995.

ELECTIVE COURSES

Field of Interest: Ergonomics

9. Jennifer Preece, Yvonne Rogers, and Helen Sharp, Interaction Design: Beyond Human-Computer Interaction, John Wiley, 2002.
10. All Book and References about Human-Machine System available in UII's Library and Laboratory of DSK&E
11. Journals about Man-Machine Ergonomics

STI932 –Industrial Ergonomics

Prerequisite(s): Work System Design & Ergonomics

Material: The Introduction and Basic Concept of Industrial Ergonomics; Skeletal and Muscular System: Concept of Anthropometry and the Utilization of Antrophometry in Design; Concept of Biomechanics and its Application in Works; Work Physiology and Workload Measurement; Concept of Manual Material Handling; Physical Work Environment; Temperature, Lighting, Noise, Vibration; Concept of Work Rotation towards Workers' Health

References:

1. Grandjean, E. 1993. Fitting the Task to The Man . 4th edition. London : Taylor & Francis
2. Tayyari, F. and Smith, J. L. 1997. Occupational Ergonomics Principles and Applications. New York: Chapment & Hall.
3. Wickens, C. D., Lee, J.D., Liu, Y. And Becker, S.E.G. 2004. An Introduction to Human Factors Engineering. New Jersey: Prentice-Hall.
4. Rodahl, K. 1989. The Physiology of Work. London : Taylor & Francis Ltd.
5. Bridger R.S. 1995. Introduction to Ergonomics. Singapore: Mc.Graw–Hill International.
6. Helander, M, 2006. A guide to human factors and ergonomics, Second Edition, New York: CRC Press.
7. Pheasant, S. and Haslegrave, C., M. 2006. Bodyspace: Anthropometry, ergonomics, and design of work. New York: CRC Press

ELECTIVE COURSES

Field of Interest: Ergonomics

STI933 – Environmental Ergonomics

Prerequisite(s): Environmental Chemistry, Work System Design & Ergonomics
Material: 1. Basic Concept and Introduction to Environmental Ergonomics 2. Mechanism Control and Lighting Control 3. Basic Concept of Noise 4. Mechanism System and Noise Control 5. Basic Concept of Temperature 6, Mechanism System and Temperature Control 7. Basic Concept of Vibration 8. Mechanism System and Vibration Control 9. Integration in Work Environment
References:

1. Covan, James. (1995). Safety Engineering, Wiley Series in New Dimensions in Engineering, New York, NY.
2. Ashfal, C. Ray. (1995). Industrial Safety and Health Management, 3rd edition. Prentice-Hall, New Jersey
3. Wickens C. et al: An Introduction to Human Factor Engineering
4. Hammer, Occupational Safety Management and Engineering, Prentice-Hall, New Jersey
5. Kumar, S. Advanced in Occupational Ergonomics and Safety, IOS Press, 1998
6. Reese, C.D. Et al (2006): Handbook of OSHA Construction Safety and Health, 2nd edition. Taylor & Francis
7. Grantham, David. Occupational Health and Hygiene Guidebook for the WHSO, Merino Lithographic, Mooroka.
8. All books and references about Environmental Ergonomics are available in UII's Library and Laboratory of DSK&E
9. Journals on Environmental Ergonomics

STI934 –Ergonomic Design for Special Purpose

Prerequisite(s): Product Design, Work System Design & Ergonomics
Material: 1. Introduction to ergonomic for special purpose 2. Universal design 3. 'Extra-ordinary' Individuals and Groups of People 4. Method and Assessment Technique 5. The Principles of Human Factors Engineering 6. Design for Movement 7. Ergonomic Design for Kids 8. Ergonomic Design for Elderly 10. Ergonomic Design for Pregnant Woman
References:

1. Kashyap, S. N., Sharma, P., & Shukla, A. (2014). Ergonomic of Old Age Homes and Health. Natraj Publisher.
2. Kroemer, K. H. (2005). "Extra-Ordinary"; Ergonomics: How to Accommodate Small and Big
3. Persons, The Disabled and Elderly, Expectant Mothers, and Children. United States of America: Taylor & Francis Group.
4. Lueder, E. R., & Rice, V. J. (2008). Ergonomics for Children: Designing Products and Places for Toddler to Teens. United States: Taylor & Francis Group.

ELECTIVE COURSES

Field of Interest: Ergonomics

STI935 – Cognitive Ergonomic

Prerequisite(s): Work System Design & Ergonomics

Material: 1. Basic Concept of Cognitive Ergonomics 2. Principles in Human Information Processing (HIP) 3. Human Senses System 4. Perception Concept of Industrial Engineering Syllabus Version/Revision 1/0 Page 2/2 5. Concept of Situation Awareness (SA) 6. Method of SA Measurement 7. Memory Concept, Attention Resources and Decision Making 8. Human Error and Human Reliability Analysis 9. Human Error Identification (HEI) Method 10. Mental Workload Analysis 11. Cognitive Task Analysis Method 12. Interface Analysis Method 13. Design Method

References:

1. Endsley, M.R., and Jones, D.B., 2004, Design for Situation Awareness, CRC Press, New York
2. Endsley, M.R., and Garland, D.J., 2000, Situation Awareness Analysis and Measurement, Lawrence Erlbaum Associates, London
3. Salmon, P., Stanton, N., Walker, G., and Green, D., 2006, Situation Awareness Measurement: A review of applicability for C4i environments, Applied Ergonomics, 37: 225-238
4. Ma, R., and Kaber, D.B., 2007, Situation Awareness and Driving Performance in a Simulated Navigation Task, Journal Ergonomics Vol. 50 No. 8, pg. 1351-1364
5. Stanton, N. A., etc., Human Factors Methods, Ashgate Publishing Company, USA.
6. Stanton, N. A., etc., Handbook of Human Factors and Ergonomics Methods, CRC Press, USA.
7. Salvendy, G., 2006, Handbook of Human Factors and Ergonomics, John Wiley & Sons, Inc., Canada.
8. Sandom, C., and Harvey, R.S., 2009, Human Factor for Engineers, The Institution of Engineering and Technology, London
9. Wickens, C. D., Lee, J.D., Liu, Y. And Becker, S.E.G. (2004). An Introduction to Human Factors Engineering. New Jersey: Prentice-Hall.

STI936 –Macro Ergonomics

Prerequisite(s): Work System Design & Ergonomics

Material: 1. Basic Concept of Macro Ergonomics 2. Methods in Macro Ergonomics 3. Participatory Ergonomics 4. Research in Laboratory 5. Research in Field 6. Organization Ergonomics 7. Case Study in Macro Ergonomics in Manufacturing Company (Presentation on Research of Macro Ergonomics) 8. Direct and Indirect Data Collection (Interview and FGD) 9. SHIP Approach 10. QFD and AHP 11. Macroergonomics Analysis and Design (MEAD) 12. Sociotechnical Macro Ergonomy 13, Case Study on Macro Ergonomics in Service Company (Research Presentation on Macro Ergonomics)

ELECTIVE COURSES

Field of Interest: Ergonomics

References:
1. Hendrick, HW. and Kleiner B.M. (2001). Macroergonomics an Introduction to Work System Design, USA: HFES.
2. Bridger, R., S. (1995). Introduction to Ergonomic. New York: McGraw-Hill.
3. Stanton,N., Alan H, Brookhuis. Karel,2005, "Handbook of Human Factors and Ergonomics Methods", CRC Press.
4. Wickens, C. D., Lee, J.D., Liu, Y. And Becker, S.E.G. (2004). An Introduction to Human Factors Engineering. New Jersey: Prentice-Hall.

STI937 –Environmental Occupational Health and Safety

Prerequisite(s): Occupational Safety and Health (OSH)

Material: 1. Basic Concept and Introduction OSH 2. General Risk Assessment/Risk Assessment 3. Basic Concept of Lighting 4. Mechanism System and Lighting Control 5. Basic Concept of Noise 6. Mechanism System and Noise Control 7. Basic Concept of Temperature 8. Mechanism System and Temperature Control 9. Basic Concept Vibration 10. Mechanism System and Vibration Control 11. Basic Law of OSH and Safety Methodology, Hierarchy of Control. 12. Accident causation and Investigation, Job Safety Analysis. 13. Accident Model. 14. Waste Treatment Waste Water Treatment Plant 15. PPE. 16. Safety and psychology. 17. Cost/Benefit analysis. 18. Integration of Work Environment - Overal Design and Safety Precaution/Procedur

References:
1. Ferrett, E. (2015). Health and Safety at Work Revision Guide: For the NEBOSH National General Certificate in Occupational Health and Safety. Routledge.
2. Covan, James. (1995). Safety Engineering, Wiley Series in New Dimensions in Engineering, New York, NY.
3. Ashfal, C. Ray. (1995). Industrial Safety and Health Management, 3rd edition. Prentice-Hall, New Jersey
4. Wickens C. et al: An Introduction to Human Factor Engineering
5. Hammer, Occupational Safety Management and Engineering, Prentice-Hall, New Jersey
6. Kumar, S. Advanced in Occupational Ergonomics and Safety, IOS Press, 1998
7. Reese, C.D. Et al (2006): Handbook of OSHA Construction Safety and Health, 2nd edition. Taylor & Francis
8. Grantham, David. Occupational Health and Hygiene Guidebook for the WHSO, Merino Lithographic, Mooroka.
9. All books and references about OSH are available in UII's Library and Laboratory of DSK&E
10. Journals on OSH

ELECTIVE COURSES

Field of Interest: Ergonomics

STI938 - Transport safety

Prerequisite(s): Occupational Safety and Health (OSH)

Material: 1. Basic Concept and Introduction to Transport Safety. 2. General Risk Assessment/Risk Assessment. 3. System of Transport Safety Management 4. Transportation Mode 5. Road Safety 6. Driving Safety/Simulation 7. Train/Railroads Safety 8. Water Transport Safety 9. Aviation Safety 10. Basic Law of OSH and Safety Methodology, Hierarchy of Control. 11. Accident Causation and Investigation, Job Safety Analysis. 12. Accident Model. 13. PPE. 14. Safety and psychology. 15. Cost/Benefit analysis. 16. Integration of Transport Safety – Overal Design and Safety Precaution/Procedure

References:

1. Asfahl. C., R. (1995). Industrial Safety and Health Management. 3th edition. New Jersey: Prentice-Hall
2. Covan, James. (1995). Safety Engineering, Wiley Series in New Dimensions in Engineering, New York, NY.
3. Grantham, David. (2000). Occupational Health and Hygiene Guidebook for the WHSO, Merino Lithographics, Mooroka.
4. Hammer, W. (2000). Occupational Safety Management and Engineering, Prentice-Hall, New Jersey
5. Kumar, S. Advanced in Occupational Ergonomics and Safety, IOS Press, 1998
6. Reese, C.D. Et al. (2006): Handbook of OSHA Construction Safety and Health, 2nd edition. Taylor & Francis
7. Suma'mur. (1981). Keselamatan Kerja dan Pencegahan Kecelakaan . Jakarta : PT Gunung Agung.
8. Silalahi, B.,N.,B. dan Silalahi, R., B., S. (1991). Manajemen Keselamatan dan Kesehatan Kerja. Jakarta : PT. References Binaman Pressindo.
9. Wickens, C. D., Lee, J.D., Liu, Y. And Becker, S.E.G. (2004). An Introduction to Human Factors Engineering. New Jersey: Prentice-Hall.
10. Ferrett, E. (2015). Health and Safety at Work Revision Guide: For the NEBOSH National General Certificate in Occupational Health and Safety. Routledge.
11. All books and references about Transport Safety are available in UII's Library and Laboratory of DSK&E
12. Journals on Transport Safety

STI936 –Macro Ergonomics

Prerequisite(s): Work System Design & Ergonomics

Material: 1. Basic Concept of Macro Ergonomics 2. Methods in Macro Ergonomics 3. Participatory Ergonomics 4. Research in Laboratory 5. Research in Field 6. Organization Ergonomics 7. Case Study in Macro Ergonomics in Manufacturing Company (Presentation on Research of Macro Ergonomics) 8. Direct and Indirect Data Collection (Interview and FGD) 9. SHIP Approach 10. QFD and AHP 11. Macroergonomics Analysis and Design (MEAD) 12. Sociotechnical Macro Ergonomy 13, Case Study on Macro Ergonomics in Service Company (Research Presentation on Macro Ergonomics)

ELECTIVE COURSES

for Internship

1. STI948 - Industrial System Analysis
2. Prerequisite(s): None
3. Material: Production System, Ergonomics, Industrial Management, and Operation Research
4. References:
5. All References related to Production System, Ergonomics, Industrial Management, and Operation Research

for Internship

STI949 - Technopreneurship

Prerequisite(s): None

Material: Aspect of Product Innovation in Business: TRIZ for Product Design; Business Aspect in Business: Digital Marketing, BMC; Financial Aspect in Business: Investment Analysis, Cash Flow; Organization Aspect in Business; Organization Structure

References:

1. External Funding Guidance
2. All References Related to the Study

GRADUATION STANDARD

Undergraduate Program in Industrial Engineering

Graduation standards for students of Undergraduate Program in Industrial Engineering started from batch 2021 and

Regular Program

a. Fulfilling 144 credits with a minimum GPA of 2,25
b. Completing Diploma Companion Certificate (SKPI)
c. A Minimum score of C for courses
d. English proficiency of CEPT minimum 425

International Program

1. Fulfilling 144 credits with a minimum GPA of 2,25
2. Completing Diploma Companion Certificate (SKPI)
3. Earning a Minimum score of C to all courses
4. English proficiency with minimum of 670 CEPT Score or any equivalent English proficiency scores.

THE 2022/2023 ACADEMIC GUIDELINE

CONTACT US

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