

Curriculum Summary

Information Engineering Study Program College of Engineering, Universitas Gadjah Mada 5/9/18

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Study Program Curriculum Summary

Information engineering study program

I. Foreword

This document shows the study program curriculum summary based on Outcome Based Education Assessment model on information engineering program. Information engineering program has high commitment to fulfill the learning assessment that based on outcome-based education. Information engineering program is the English name of Program Studi Teknologi Informasi UGM (PSTIF UGM). The name of information engineering as English name is used because the uniqueness of the curriculum of the study program that more engineering than computing. The uniqueness happens because the information engineering comes from the options on electrical engineering study program which are computer engineering and information. The study program established on its own since the year 2010. The name Information engineering is coined on 2018 as part of our commitment to continuous improvement on the study program.

Since 2016, There are two program educational objectives (PEO)one for the career and one for the character. Each PEO will be derived into three categories of student outcome namely cognitive, skill, and affective outcome categories. There are 11 student outcomes for information engineering program. Each student outcome will have two performance indicator rubrics. This curriculum summary will evolve based on our commitment to improving the curriculum and learning delivery for the students. Therefore, there might change between this document and the comprehensive document in Bahasa Indonesia. The next version of this document will be updated on June 2019.

II. Program Overview

The program leads to bachelor's degree in information engineering. It is presented by a four-year model that housed in the electrical engineering and information engineering department, in a college of engineering Universitas Gadjah Mada. The program requires to fullfil the basic science and mathematic in department level, general education in department and college of engineering level, and engineering topic in study program level. The program has three options: software engineering, information system engineering, and computer engineering. It has orientation directed in the depth area of engineering. Graduate will be designed based on institutional vision & mission.

Institutional Vision & Mission

Vision: "Universitas Gadjah Mada as a pioneer of world-class universities that excel and innovative, serve the interests of the nation and humanity is inspired by the nation's cultural values based on Pancasila"

Mission: Conducting education, research, and community service as well as the preservation and development of superior science and beneficial to society

College of Engineering Mission/Vision Statement

Vision: To be an engineering higher education institution that has excellence and dignity, active role in development, application of science and engineering, and high integrity, cultured, and based on Pancasila.

Mission:

- a. To carry out learning process that has excellence and dignity in science and engineering for the development of humanity.
- b. To develop, disseminate, and preserve science and engineering, which is internationally recognized.
- c. To conduct creativity and implement community service by applying research-based technology based on Indonesian culture.
- d. To develop extensive cooperation with higher education institutions and other institutions inside and outside the country.

Study Program Vision & Mission

Vision: to be a universal source of innovation in the field of Information Engineering, for the benefit of the nation and humanity, imbued the nation's cultural values based on Pancasila.

Mission:

- a. To implement the learning process that produces capable and competent graduates in information engineering <u>career</u> that can be applied for the benefit of the nation and humanity.
- b. To develop an academic environment that encourages the growth of innovation through research and creativity for the benefit of the nation of Indonesia and humanity universally,
- c. To make graduates are capable and have the <u>character</u> to contribute actively to solve the problems of nation and humanity universally through the distribution and application of scientific products in the field of information engineering and related fields.

III. Objectives and Expected Outcomes of Program

Program Educational Objective

PEO1 Program Educational Objective (Career Objective)

Be successful in the technical or professional career characterized by having integrity in the aspect of Information engineering competency or related field by fulfilling professionalism, effective communication, and universal value of humanity.

SO(a) Fundamental Engineering knowledge – Cognitive Criteria

Ability to apply natural science, mathematics, and engineering fundamental theory and other relevant fields to solve complex engineering problems.

Level	Performance indicator	Unsatisfactory	Adequate	Satisfactory	Excellent
Fundamenta I (PIA1)	Identify specific facts of mathematics, science, and engineering needed for a given situation	 Little knowledge of facts Cannot identify the specific facts for a given situation Missing the key facts 	• Identifies some specific facts for a given situation, but many facts are missing.	• Identifies the key facts for the given situation.	• Identifies all the relevant facts for the given situation
Advanced (PIA2)	Demonstrate proper use of specific facts of mathematics, science, or engineering to obtain performance behavior given a certain input	 Little knowledge of models The model identified is inappropriate Cannot relate the real world situation to the model Unable to convert a real-world situation into a model 	 Some knowledge of models Basic understanding of relation between models and real- world situation Model misses some components Partially converts a real world situation into a model 	 Adequate knowledge of models Adequate understanding of relation between models and real- world situations Model is adequate Converts a real- world situation into an appropriate model 	 Knowledge of most relevant models Understand trade-offs between multiple models that model one real world situation Model is complete Converts a real- world situation into the most appropriate model with respect to the problem context

Performance Indicator (PIA) Assessment Rubric

SO(b) Development of Engineering Solution– Cognitive Criteria

Ability to identify engineering problem and employs the existing approaches, resources, and appropriate equipment to solve complex engineering problems and their activities..

Performance Indicator (PIB) Assessment Rubric

Level	Performance	Unsatisfactory	Adequate	Satisfactory	Excellent
	indicator				
Fundament	Formulate the	 Missing 	 Weak problem 	 Adequate 	 Complete and
al (PIB1)	problem and	problem	formulation	problem	succinct problem
	identify key	formulation	• Some issues /	formulation	formulation
	issues/variables of	 Missing most 	variables	 Most key issues / 	 Key issues /
	the problem	key issues /	identified, but	variables are	variables identified
		variables	many missing	identified	 All relevant
		 Missing most 	 Many criteria 	 Almost all criteria 	criteria presented
		criteria	missing	presented for	for ranking
		 Missing most 	• Many	ranking alternatives	alternatives
		constraints	constraints	 Almost all 	 All relevant
		 Missing most 	missing	constraints	constraints
		assumptions	• Many	identified	identified
			assumptions	 Almost all 	 All relevant
			missing	assumptions	assumptions
				identified	identified

Level	Performance indicator	Unsatisfactory	Adequate	Satisfactory	Excellent
Advanced (PIB2)	Analyze alternative solutions to solve the engineering problem	 Little analysis Severely flawed analysis Criteria not evaluated Constraints ignored 	 Limited analysis of alternatives Only some criteria evaluated Only some constraints considered 	 Appropriate analysis approach Mostly correct analysis results Criteria evaluated with minor errors Constraints considered with minor errors 	 Well thought out or clever analysis approach Complete and correct analysis results Complete evaluation of design criteria Complete consideration of constraints

SO(c) Engineering Design – Cognitive Criteria

Ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

Performance Indicator (PIC) Assessment Rubric

Level	Performance indicator	Unsatisfactory	Adequate	Satisfactory	Excellent
Fundament al (PIC1)	Generate alternative solutions based on engineering standard	Unable to derive any meaningful solution	 Derives a meaningful solution Unable to derive alternative solutions 	 Derives multiple solutions Has some weaknesses in evaluation of alternative solutions 	 Derives alternative solutions Performs proper evaluation of alternative solutions
Advanced (PIC2)	Build an engineering design and analyze performance based on engineering standard	Unable to build a proper prototype	 Builds a prototype with some help. Shows major weaknesses in analyzing performance 	 Builds an adequate prototype Somewhat able to analyze performance 	 Builds a well developed prototype Fully analyzes the performance

SO(d) Data and Experiments - Skill Criteria

Ability to design and conduct experiments to explore the complex engineering problem as well as to analyze and interpret data..

Level	Performance indicator	Unsatisfactory	Adequate	Satisfactory	Excellent
Fundament al (PID1)	Compare experimental data and results to appropriate theoretical models	No comparison made, or comparison made to non-make sense models	 Weak comparison of data to appropriate model Comparison of data made to model that doesn't include some important relationships among key variables 	 Adequate comparison made to appropriate model Model includes important relationships among key variables, though some minor details are missing 	 Thorough comparison conducted between sufficiently varied data set and detailed model Theoretical model is sufficiently detailed to provide insight into Driving Question
Advanced (PID2)	Explain observed differences between model and provide insight based on the model experiment	 Differences are not identified or are incorrectly explained Neither the possibility of using the wrong model nor of collecting erroneous data has been identified 	 Most differences are correctly identified, but many are poorly explained Explanation of differences does not consider use of wrong model or possibility of having erroneous data 	 All major differences are identified; only a few minor differences have been ignored Both model and data have been explored as possible sources of error 	 All relevant differences have been identified Potential weaknesses in both model and data collection procedure have been identified, but both are well done

Performance Indicator (PID) Assessment Rubric

SO(e) Modern Tools Utilization – *Skill Criteria*

Ability to use engineering techniques, skills, modern engineering tools and information technology for complex engineering practice.

Level	Performance indicator	Unsatisfactory	Adequate	Satisfactory	Excellent
Fundamental (PIE1)	Identify necessary techniques, skills and tools of modern engineering practice for a given situation	 Identifies a small subset of necessary techniques, skills, and tools Identifies unrelated techniques, skills, and tools 	 Identifies some techniques, skills, and tools, but missing some important items Includes some unrelated techniques, skills, and tools 	 Identifies almost all of the relevant techniques, skills, and tools Missing some minor techniques, skills, and tools 	 Identifies all relevant techniques, skills, and tools Does not include unrelated techniques, skills, and tools

Performance Indicator (PIE) Assessment Rubric

Level	Performance indicator	Unsatisfactory	Adequate	Satisfactory	Excellent
Advanced (PIE2)	Apply the chosen techniques, skills and tools of modern engineering practice to the given situation	 Applies a small subset of the necessary techniques, skills, and tools Incorrectly applies the techniques, skills, and tools 	 Correctly applies some of the techniques, skills, and tools, but missing some important items Incorrectly applies some techniques, skills, and tools 	 Correctly applies almost all of the techniques, skills, and tools Demonstrates adequate use of techniques, skills, and tools Incorrectly applies some minor techniques, skills, and tools 	 Correctly applies all relevant techniques, skills, and tools Demonstrates mastery of techniques, skills, and tools Does not apply unnecessary techniques, skills, and tools

SO(f) Knowledge of Contemporary Issues – Cognitive Criteria

Ability to think logically to evaluate health, social, safety, legal, and cultural issues in the context of the recent knowledge and science in performing engineering activities.

Level	Performance indicator	Unsatisfactory	Adequate	Satisfactory	Excellent
Fundamental (PIF1)	Identify contemporary issues related to information engineering and its related field.	 Little knowledge of contemporary issues Cannot identify contemporary issues 	Identifies a contemporary issue but important facts are missing	 Identifies more than one relevant contemporary issue Ignores some less significant, yet relevant issues 	 Identifies several relevant contemporary issues, including subtle details Does not include unrelated contemporary issues
Advanced (PIF2)	Explain potential solutions for contemporary issues that happened	 Shows little understanding of contemporary issues Provides little or incorrect explanation of potential solutions 	 Shows some understanding of contemporary issues Provides some explanation of potential solutions but important facts are missing 	 Shows adequate understanding of contemporary issues Provides adequate explanation of potential solutions Missing the explanation of minor facts 	 Shows in- depth understanding of contemporary issues Provides in- depth explanation of potential solutions based on engineering standard

Performance Indicator (PIF) Assessment Rubric

PEO2 Program Educational Objective (Character)

Having good spirit of leadership, high standard ethics, and lifelong-learning to maintain excellence in innovation.

SO(g) Effective Communication-Skill Criteria

Ability to communicate effectively and confidently in performing complex engineering activities.

Level	Performance indicator	Unsatisfactory	Adequate	Satisfactory	Excellent
Fundamental (PIG1)	Present content in own words to demonstrate comprehension understanding of problem and solution.	Design document does not contain clear steps to produce required features Plagiarized detected > 30 %	follow the academic literature with guidance	Design document has steps to achieve goals through engineering standard, but contains flaws	Design document correctly and clearly states functionality of the standard, and show structured way to construct the required working component
Advanced (PIG2)	Deliver an oral presentation to demonstrate the capability communicate the problem and solution	Unable to perform presentation in the classroom	Creating slides and deliver to the proper audience	Able to design and perform presentation but the several constraints is neglected	Able to design and perform oral presentation interactively and fulfill any constraints that described.

Performance Indicator (PIG) Assessment Rubric

SO(h) Multidisciplinary Teamwork– Skill Criteria

Ability to have a role effectively as individual and team to achieve common goals in a multidisciplinary environment.

Performance Indicator (PIH) Rubric

Level	Performance indicator	Unsatisfactory	Adequate	Satisfactory	Excellent
Fundamental (PIH1)	Actively take on responsibility, meet commitments to the team, quantity, and timeliness of deliverables	 Little self-aware on the team Missing on action while works on a team Doesn't understand the job role Missing major participation 	 Confusing on individual contribution Weak contribution as a personal Weak understand the job role Other sections are weak 	 Provide substantial contribution be able to communicate with the team be able to understand the job role show support with the others 	 Excellent self- organization Well-stated result and contribution Statement or Purpose Show leadership show support and mentoring with the others.

Advanced	Being able to	 Lacking information 	 Some basic 	 Adequate 	 Exceptional
(PIH2)	perform a task	or information is	information, but	information with a	information (accurate
	habitually with	inaccurate or	some is inaccurate	few minor errors or	and relevant)
	some degree of	irrelevant for the team	or irrelevant for the	omissions	Careful and
	confidence and	 Some output has 	team	• Adequate	thorough research
	proficiency with the	been plagiarized	 Significant 	research as part of	• All Result is
	team	• Presents little	amount of working	team work	coordinated with the
		understanding of	result is copied	 Result is mostly 	team.
		teamwork	verbatim from	the author's own	• Presents in-depth
			another source	words; only a slight	understanding
			with citation	amount of copied	and insight for the
			• Presents basic	and cited text	team to success
			understanding of	 Presents general 	
			some parts of	understanding of	 Having critical roles
			topic with the team	topic	in the team

SO(i) Professional and Ethical Responsibility – Affective Criteria

The ability to understand ethical values and commit to the norms, responsibilities and ethics of engineering profession. In the context of the Indonesian society, the values and norms that are considered and accepted in engineering other than universal common humanitarian norms should also include the principles of Pancasila, local cultural values, and national interests.

Level	Performance indicator	Unsatisfactory	Adequate	Satisfactory	Excellent
Fundamental (PII1)	Making judgments based on internal evidence or external criteria	Lack of awareness of professional standards in engineering design.	Has reasonable professional appearance, but may overestimate his skills and abilities	Acknowledges that a engineering design is professionally sub- standard.	Capacity to formulate specific professional standards and how they apply to engineering design.
Advanced (PII2)	Expressing a belief or attitude about the value or worth in the fields of interest	Incapacity to recognize how engineering design introduces legal or ethical issues.	Evaluates and judges a situation using personal understanding of the situation	Can voice a fundamental ethical position regarding software design but tends to confuse ethical issues with legal issues.	Clearly articulates an organized response to ethical issues in software design and can distinguish ethical issues from legal issues.

Performance Indicator (PII) Assessment Rubrics

SO(j) Engineering Awareness and Society – Affective Criteria

The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.

Level	Performance indicator	Unsatisfactory	Adequate	Satisfactory	Excellent
Fundamental (PIJ1)	Identify the global, economic, environmental, and societal context of an engineering problem.	 Unable to identify relevant contexts of the problem. Relevant contexts described in an extremely limited fashion. 	 One relevant context of the four listed context types identified. The one relevant context described in only a rudimentary fashion. 	 Relevant contexts among two or three of the four listed context types recognized. At least two contexts described substantively. 	 Relevant contexts among three or four of the four listed context types identified. At least three of the contexts described thoroughly.
Advanced (PIJ2)	Explain the impact of engineering decisions in a global, economic, environmental and societal context.	Explanation of relevant impacts of engineering decisions absent or extremely limited.	 Explanation of engineering decision impact touches on only one context. Explanation of relevant impacts of engineering decisions is rudimentary. 	 Explanation of relevant impacts of engineering decisions touches on two to three of the contexts. Explanation is substantive in most contexts. 	 Explanation of relevant impacts of engineering decisions touches on three or four of the contexts. Explanation is at least substantive in all contexts and is thorough in the majority.

Performance Indicator (PIJ) Assessment Rubric

SO(k) Sustainable learning – Affective Criteria

Ability to realize the importance of lifelong learning and able to carry it out.

Level	Performance indicator	Unsatisfactory	Adequate	Satisfactory	Excellent
Fundamental (PIK1)	Demonstrate ability to actively and independently pursue new learning opportunities	demonstrates no knowledge of new skill	unable to solve problem but demonstrates some knowledge of new skill	demonstrates some knowledge of new skill and able to partially solve given problem	able to solve given problem completely by applying new skill
Advanced (PIK2)	Using previously learned skills to perform new but related tasks	denies need for continuous professional development	acknowledges possibility of need for continuing professional development	acknowledges need for continuing professional development	provides convincing argument for need for continuous professional development

Performance Indicator (PIK) Assessment Rubric

IV. Curriculum

Summary of Requirements

Area	Credit Hours	Percentage
Basic Science	35.5	24.66%
Engineering Knowledge	88.25	61.28%
General Education	20.25	14.06%
Total Credit	144	100%

Study Plan

Course	Course Name	Credit	Course	Course Name	Credit
Code			Code		
Semester 1	l		Semester 2	2	
TKIE161101	Engineering Mathematics (Course+Tutorial)	3	TKIE161201	Electrical Engineering Mathematics (Course+Tutorial)	3
TKIE161102	Electrical Engineering Physics (Course+Tutorial)	4	TKIE161202	Engineering Physics (Course+Tutorial)	4
TKU125	Probability and Statistics	3	TKIE162202	Numerical Methods (Course+Tutorial)	3
TKIE161103	Fundamentals of Programming	3	TKIE162202P	Numerical Methods Lab. Work	1
TKIE161103P	Fundamentals of Programming Work Lab	1	FIU300	Pancasila ^{*)}	2
TKU100	Scientific Writing and Reporting	2	FIU200	Engineering Concept for Civilization	2
TKIT161104	Introduction to Information Technology	2	TKIT161203	Computer Architectures	2
TKIE161105	Algorithm and Data Structures	3	TKIT161204	Object Oriented Programming	3
			TKIT161204P	Object Oriented Programming Lab. Work	1
	Total Credits	21	Total Credits		21
Semester 3	3		Semester 4		
TKIE162101	Logic and Discrete Mathematics	3	TKIE162201	Electromagnetic Fields (Course+Tutorial)	3
TKIE162102	Signals and Systems (Course & Tutorial)	4	TKIE162201P	Electromagnetic Fields Lab. Work.	1
TKIE162102P	Signals and Systems Lab. Work	1	TKIE161203	Linear Algebra	3
TKIE163101	Network and Data Communication	2	TKIE161204	Digital Technique	2
UNU401	Studium Generale	1	TKIT162205	Graphical Visualization Engineering	2
TKIT162103	Operating System	2	TKIT162206	Artificial Intelligence	2
TKIE162103	Microprocessor Systems	3	TKIT162207	Software Architecture	2
TKIT162104	Modeling and Simulation	2	TKIT162208	Software Engineering	3
TKIT162105	Database Engineering	2	TKIT162209	Human Computer Interaction	3
TKIT162105P	Database Engineering Lab. Work	1			
	Total Credits	21		Total Credits	21

Semester 5		
Course Code	Course Name	Credit
TKU314	Engineering Planning	2
TKIT163101	Computer Networks	2
TKIT163102	Multimedia Technology	2
TKIT163103	Interfaces and Peripherals	2
TKIT163104	Student Project	2
TKIT163105	Interoperability	2
TKIT163106	Distributed System	3
TKIT163101P	Computer Networks Lab. Work	1

Total Credit	s 16

COMPUTER SYSTEM ENGINEERING

Course Code	Course Name	Credit
TKIE163224	Digital Signal Processing Technique	3
	Total Credits	3

SOFTWARE ENGINEERING COMPETENCY AND INFORMATION SYSTEM ENGINEERING

Course Code	Course Name	Credit
TKIT163107	Information Systems	3
	Total Credits	3

Semester 6		
Course Code	Course Name	Credit
TKU311	Industrial Management	2
UNU312	Entrepreneurship	2
TKU313	Capita Selecta	2
TKIT163202	Security and Data Integrity	3
	Total Credits	9

COMPUTER SYSTEM ENGINEERING

Course Code	Course Name	Credit
TKIT163213	Wireless and Mobile Computing	3
TKIT163214	Computer Network Security	3
TKIT163218	Microprocessor-Based System	2
	Preference	3
	Total Credits	11

SOFTWARE ENGINEERING COMPETENCY

Course Code	Course Name	Credit
TKIT163225	Economics and Business of Information	2
TKIT163226	Software Quality	3
TKIT163229	Applications and Information Integration	3
	Preference	3
	Total Credits	11

INFORMATION SYSTEM ENGINEERING

Course Code	Course Name						
TKIT163225	Economics and Business of Information	2					
TKIT16337	Information Systems Security	3					
TKIT163229	Applications and Information Integration	3					
	Preference	3					
	Total Credits	11					

Semester 7		
Course Code	Course Name	Credit
TKIE164101	Thesis Proposal	2
FIU40x	Religion	2
UNU310	National Resilience	2
TKIE164102	Internship	2
	Total Credits	8

COMPUTER SYSTEM ENGINEERING, SOFTWARE ENGINEERING COMPETENCY, AND INFORMATION SYSTEM ENGINEERING

Course Code	Course Name	Credit
	Elective	3
	Elective	3
	Total Credits	

Semester 8		
Course Code	Course Name	Credit
UNU500	Community Development	3
TKIE164201	Thesis and Oral Examination	4
	Total Credits	7

ELECTIVE COURSE FOR COMPUTER SYSTEM ENGINEERING

Course Code	Course Name	Credit
TKIT165211	Image processing and Computer	3
TKIT165111	Data Compression Technique	3
TKIT165212	Systems Based Internet of Things	3
TKIT165112	Mobile Communications System	3
TKIT165201	Special Topics for Information Technology	3
TKIT165101	User Experience	3
TKIT165202	ICT and Society	3
TKIT165102	IT Audit and Risk Management	3

ELECTIVE COURSE FOR SOFTWARE ENGINEERING COMPETENCY

Course Code	Course Name	Credit
TKIT165221	Mobile Application Development	3
TKIT165121	Game Application Development	3
TKIT165222	Software Testing	3
TKIT165122	Web Application Development	3
TKIT165201	Special Topics for Information Technology	3
TKIT165101	User Experience	3
TKIT165202	ICT and Society	3
TKIT165102	IT Audit and Risk Management	3

ELECTIVE COURSE FOR INFORMATION SYSTEM ENGINEERING

Course Code	Course Name	Credit
TKIT165131	Big Data and Analytic	3
TKIT165231	Analysis and Design of Information	3
TKIT165132	Decision Support System	3
TKIT165232	Enterprise-Based System	3
TKIT165201	Special Topics for Information Technology	3
TKIT165101	User Experience	3
TKIT165202	ICT and Society	3
TKIT165102	IT Audit and Risk Management	3

Body Knowledge Coverage

Curriculum 2016 is based on Curriculum 2011 based on several adjustments. The adjustment process is based on our continuous improvement framework that described on Continuous Improvement Cycle (CIC). The curriculum will be refined on Student Outcome Cycle. It happens on every two years for minor changes. This table will subject to changes on 2018/2019 I.

The Relation between SO and ABET Criteria

	ABET Criteria 2017 / 2018	ility to apply knowledge of mathematics, science, and engineering	ility to design and conduct experiments, as well as to analyze and interpret data	bbility to design a system, component, or process to et desired needs within realistic constraints such as omic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	an ability to function on multidisciplinary teams	ability to identify, formulate, and solve engineering problems	derstanding of professional and ethical responsibility	an ability to communicate effectively	oad education necessary to understand the impact of eering solutions in a global, economic, environmental, and societal context	gnition of the need for, and an ability to engage in life- long learning	a knowledge of contemporary issues	n ability to use the techniques, skills, and modern gineering tools necessary for engineering practice.
		an a	an a	an eco		ar	an u		the k engir	a reco		Ū
	Student Outcome	1	2	3	4	5	6	7	8	9	10	11
	Fundamental Engineering	V										
а	knowledge	•										
	Development of Engineering											
b	Solution					V						
С	Engineering Design			V								
d	Data and Experiment		V									
е	Modern Tools Utilization											V
	Knowledge of Contemporary										V	
f	Issues										v	

	ABET Criteria 2017 / 2018	an ability to apply knowledge of mathematics, science, and engineering	an ability to design and conduct experiments, as well as to analyze and interpret data	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	an ability to function on multidisciplinary teams	an ability to identify, formulate, and solve engineering problems	an understanding of professional and ethical responsibility	an ability to communicate effectively	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	a recognition of the need for, and an ability to engage in life- long learning	a knowledge of contemporary issues	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
g	Effective Communication							V				
h	Multidisciplinary Teamwork				V							
	Professional and Ethical											
i.	Responsibility						V					
	Engineering Awareness and											
j.	Society								V			
k.	Sustainable Learning									V		

The Relation SO and Domain of Learning

	Domain of Learning	Cognitive	Skill	Affective
	Study Program Student Outcome	1	2	3
a.	Fundamental Engineering knowledge	V		
b.	Development of Engineering Solution	V		

	Domain of Learning	Cognitive	Skill	Affective
c.	Engineering Design	V		
d.	Data and Experiment		V	
e.	Modern Tools Utilization		V	
f.	Knowledge of Contemporary Issues	V		
g.	Effective Communication		V	
h.	Multidisciplinary Teamwork		V	
i.	Professional and Ethical Responsibility			V
j.	Engineering Awareness and Society			V
k.	Sustainable Learning			V

The relation between PEO and SO

SO(x)	Student Outcome	#PEO1	#PEO2
		1	2
а	Engineering knowledge Utilization	v	
b	Development of Engineering Solution	v	
С	Engineering Design	v	
d	Data and Experiments	v	
е	Modern Tools Utilization	v	
f	Knowledge of Contemporary Issues	v	
g	Effective Communication		v
h	Multidisciplinary Teamwork		v
i	Professional and Ethical Responsibility		v
j	Engineering Awareness and Society		v
k	Sustainable Learning		v

Relation Between Course and Student Outcome.

Course Code	Grade	Course Name	Course Indicator	Fundamental Engineering knowledge (a)	Development of Engineering Solution (b)	Engineering Design (c)	Data and Experiment (d)	Modern Tools Utilization €	Knowledge of Contemporary Issues (f)	Effective Communication (g)	Multidisciplinary Teamwork (h)	Professional and Ethical Responsibility (i)	Engineering Awareness and Society (j)	Sustainable Learning (k)
TKIE161101	1	Engineering Mathematics (Course+Tutorial)	R											
TKIE161102	1	Electrical Engineering Physics (Course+Tutorial)	R											
TKU125	1	Probability and Statistics	R		\checkmark		\checkmark							
TKU100	1	Scientific Writing and Reporting	R							\checkmark	\checkmark	\checkmark		
TKIE161103	1	Fundamentals of Programming	R											
TKIE161103P	1	Fundamentals of Programming Lab Work	R											
TKIT161104	1	Introduction to Information Technology	R											
TKIT161105	1	Algorithm and Data Structures	R					\checkmark						
TKIE161201	2	Electrical Engineering Mathematic (Course+Tutorial)	R	V	V									
TKIE161202	2	Engineering Physics (Course+Tutorial)	R											
TKIE162202	2	Numerical Methods (Course+Tutorial)	R	\checkmark	\checkmark		\checkmark							
TKIE162202P	2	Numerical Methods Lab Work	R		\checkmark		\checkmark	\checkmark						
FIU300	2	Pancasila	R									\checkmark		

Course Code	Grade	Course Name	Course Indicator	Fundamental Engineering knowledge (a)	Development of Engineering Solution (b)	Engineering Design (c)	Data and Experiment (d)	Modern Tools Utilization €	Knowledge of Contemporary Issues (f)	Effective Communication (g)	Multidisciplinary Teamwork (h)	Professional and Ethical Responsibility (i)	Engineering Awareness and Society (j)	Sustainable Learning (k)
FIU200	2	Engineering Concept for Civilization	R						\checkmark				\checkmark	
TKIT161203	2	Computer Architectures	R					\checkmark					\checkmark	
TKIT161204	2	Object Oriented Programming	R		\checkmark	\checkmark		\checkmark						
TKIT161204P	2	Object Oriented Programming Lab Work	R		\checkmark	\checkmark	\checkmark	\checkmark						
TKIE162101	3	Logic and Discrete Mathematics	R	\checkmark	\checkmark									
TKIE162102	3	Signals and System (Course + Tutorial)	R	\checkmark	\checkmark									
TKIE162102P	3	Signals and System Lab Work	R		\checkmark	\checkmark		\checkmark			\checkmark			
TKIE163101	3	Network and Data Communication	R	\checkmark	\checkmark			\checkmark						
UNU401	3	Studium General	R						\checkmark					\checkmark
TKIT162103	3	Operating System	R	\checkmark				\checkmark						
TKIE162103	3	Microprocessor Systems	R	\checkmark				\checkmark						
TKIT162104	3	Modellling and Simulation	R	\checkmark	\checkmark			\checkmark						
TKIT162105	3	Database Engineering	R	\checkmark	\checkmark			\checkmark						
TKIT162105P	3	Database Engineering Lab Work	R		\checkmark	\checkmark	\checkmark	\checkmark						
TKIE162201	4	Electromagnetics Fields (Course+Tutorial)	R		\checkmark									

Course Code	Grade	Course Name	Course Indicator	Fundamental Engineering knowledge (a)	Development of Engineering Solution (b)	Engineering Design (c)	Data and Experiment (d)	Modern Tools Utilization €	Knowledge of Contemporary Issues (f)	Effective Communication (g)	Multidisciplinary Teamwork (h)	Professional and Ethical Responsibility (i)	Engineering Awareness and Society (j)	Sustainable Learning (k)
TKIE162201P	4	Electromagnetics Fields Lab Work	R		\checkmark		\checkmark	\checkmark			\checkmark			
TKIE161203	4	Linear Algebra	R	\checkmark										
TKIE161204	4	Digital Technique	R	\checkmark	\checkmark									
TKIT162205	4	Graphical Visualization Engineering	R	\checkmark	\checkmark	\checkmark		\checkmark						
TKIT162206	4	Artificial Intelligence	R	\checkmark	\checkmark			\checkmark						
TKIT162207	4	Software Architecture	R	\checkmark				\checkmark						
TKIT162208	4	Software Engineering	R		\checkmark	\checkmark		\checkmark						
TKIT162209	4	Human Computer Interaction	R		\checkmark	\checkmark			\checkmark				\checkmark	
TKU314	5	Engineering Planning	R			\checkmark							\checkmark	
TKIT163101	5	Computer Networks	R			\checkmark		\checkmark						
TKIT163102	5	Multimedia Technology	R	\checkmark	\checkmark			\checkmark					\checkmark	
TKIT163103	5	Interfaces and Peripherals	R		\checkmark	\checkmark		\checkmark						
TKIT163104	5	Student Project	R			\checkmark		\checkmark					\checkmark	
TKIT163105	5	Interoperability	R		\checkmark	\checkmark	\checkmark							
TKIT163106	5	Distributed System	R	\checkmark	\checkmark	\checkmark		\checkmark						
TKIT163101P	5	Computer Networks Lab. Work.	R		\checkmark	\checkmark		\checkmark						\checkmark
TKIE163224	5	Digital Signal Processing Technique	SE	\checkmark	\checkmark			\checkmark						
TKIT163107	5	Information Systems	SE	\checkmark	\checkmark			\checkmark						
TKU311	6	Industrial Management	R											

Course Code	Grade	Course Name	Course Indicator	Fundamental Engineering knowledge (a)	Development of Engineering Solution (b)	Engineering Design (c)	Data and Experiment (d)	Modern Tools Utilization €	Knowledge of Contemporary Issues (f)	Effective Communication (g)	Multidisciplinary Teamwork (h)	Professional and Ethical Responsibility (i)	Engineering Awareness and Society (j)	Sustainable Learning (k)
UNU312	6	Entrepreneurship	R						\checkmark		\checkmark		\checkmark	\checkmark
TKU313	6	Capita Selecta	R							\checkmark	\checkmark		\checkmark	\checkmark
TKIT163202	6	Security and Data Integrity	R		\checkmark			\checkmark	\checkmark				\checkmark	
TKIT163213	6	Wireless and Mobile Computing	SE		\checkmark			\checkmark					\checkmark	
TKIT163225	6	Economics and Business of Information	SE					\checkmark	\checkmark				\checkmark	
TKIT163214	6	Computer Network Security	SE	\checkmark				\checkmark	\checkmark					
TKIT163226	6	Software Quality	SE		\checkmark			\checkmark	\checkmark				\checkmark	
TKIT16337	6	Information Systems Security	SE	\checkmark					\checkmark				\checkmark	
TKIT163218	6	Microprocessor-Based System	SE		\checkmark			\checkmark						
TKIT163229	6	Applications and Information Integration	SE		\checkmark			\checkmark						
TKIE164101	7	Thesis Proposal	R		\checkmark					\checkmark		\checkmark		
FIU40x	7	Religion	R						\checkmark			\checkmark		
UNU310	7	National Resilience	R						\checkmark			\checkmark		\checkmark
TKIE164102	7	On the Job Training	R						\checkmark	\checkmark				
UNU500	8	Community Development	R							\checkmark				\checkmark
TKIE164201	8	Thesis and Oral Examination	R			\checkmark				\checkmark		\checkmark	\checkmark	\checkmark

Course Code	Grade	Course Name	Course Indicator	Fundamental Engineering knowledge (a)	Development of Engineering Solution (b)	Engineering Design (c)	Data and Experiment (d)	Modern Tools Utilization €	Knowledge of Contemporary Issues (f)	Effective Communication (g)	Multidisciplinary Teamwork (h)	Professional and Ethical Responsibility (i)	Engineering Awareness and Society (j)	Sustainable Learning (k)
TKIT165211	Elective	Image processing and Computer	E	\checkmark	\checkmark		\checkmark	\checkmark						
TKIT165111	Elective	Data Compression Technique	E		\checkmark			\checkmark					\checkmark	
TKIT165212	Elective	Systems Based Internet of Things	E		\checkmark				\checkmark				\checkmark	
TKIT165112	Elective	Mobile Communications System	E	\checkmark					\checkmark					
TKIT165221	Elective	Mobile Application Development	E			\checkmark							\checkmark	
TKIT165121	Elective	Game Application Development	E		\checkmark	\checkmark							\checkmark	
TKIT165222	Elective	Software Testing	E	\checkmark	\checkmark		\checkmark							
TKIT165122	Elective	Web Application Development	E		\checkmark	\checkmark		\checkmark						
TKIT165131	Elective	Big Data and Analytic	E		\checkmark			\checkmark	\checkmark				\checkmark	
TKIT165231	Elective	Analysis and Design of Information	E		\checkmark	\checkmark		\checkmark						
TKIT165132	Elective	Decision Support System	E		\checkmark			\checkmark	\checkmark				\checkmark	
TKIT165232	Elective	Enterprise-Based System	E											
TKIT165201	Elective	Special Topics for Information Technology	E	\checkmark	\checkmark				\checkmark				\checkmark	
TKIT165101	Elective	User Experience	E		\checkmark								\checkmark	
TKIT165202	Elective	ICT and Society	E		\checkmark								\checkmark	

Course Code	Grade	Course Name	Course Indicator	Fundamental Engineering knowledge (a)	Development of Engineering Solution (b)	Engineering Design (c)	Data and Experiment (d)	Modern Tools Utilization €	Knowledge of Contemporary Issues (f)	Effective Communication (g)	Multidisciplinary Teamwork (h)	Professional and Ethical Responsibility (i)	Engineering Awareness and Society (j)	Sustainable Learning (k)
TKIT165102	Elective	IT Audit and Risk Management	E	\checkmark	\checkmark			\checkmark	\checkmark				\checkmark	

Relation between Course and Criteria

Sem	nester 1										
N				Credit	S	ession Meeting	5		Ratio		Credit
0	Course Code	Course Name (ID)	Course Name (EN)	S	Basic	Engineerin	General	Basic	Engineerin	General	S
		Matematika Teknik			Science	Ĕ	Eu.	Science	Ĕ	Eu.	-
1	TKIE161101	(Kuliah+Tutorial)	Engineering Mathematics (Course+Tutorial)	3	14			3.00	0.00	0.00	3.00
2	TKIE161102	Fisika Elektro (Kuliah+Tutorial)	Electrical Engineering Physics (Course+Tutorial)	4	14			4.00	0.00	0.00	4.00
3	TKU125	Probabilitas dan Statistika	Probability and Statistics	3	14			3.00	0.00	0.00	3.00
4	TKIE161103	Pemrograman Dasar	Fundamentals of Programming	3		14		0.00	3.00	0.00	3.00
5	TKIE161103 P	Prakt. Pemrograman Dasar	Fundamentals of Programming Work Lab	1		6		0.00	1.00	0.00	1.00
6	TKU100	Penulisan Laporan dan Karya Ilmiah	Scientific Writing and Reporting	2			14	0.00	0.00	2.00	2.00
7	TKIT161104	Pengantar Teknologi Informasi	Introduction to Information Technology	2		14		0.00	2.00	0.00	2.00
8	TKIT161105	Algoritme dan Struktur Data	Algorithm and Data Structures	3		14		0.00	3.00	0.00	3.00
		Total		21	42	48	14	10.00	9.00	2.00	21.00

Sem	ester 2										
N	Course			Credit	S	ession Meeting	5		Ratio		Credi
0	Code	Course Name (ID)	Course Name (EN)	S	Basic	Engineerin	General	Basic	Engineerin	General	t
-				-	Science	g	Ed.	Science	g	Ed.	
1			Electrical Engineering Math								
T	TKIE161201	Matematika Elektro (Kuliah+Tutorial)	(Course+Tutorial)	3	14			3.00	0.00	0.00	3.00

2	TKIE161202	Fisika Teknik (Kuliah+Tutorial)	Engineering Physics (Course+Tutorial)	4	14			4.00	0.00	0.00	4.00
3	TKIE162202	Metode Numeris (Kuliah+Tutorial)	Numerical Methods (Course+Tutorial)	3	14			3.00	0.00	0.00	3.00
4	TKIE162202 P	Prakt. Metode Numeris	Numerical Methods Lab. Work	1	6			1.00	0.00	0.00	1.00
5	FIU300	Pancasila	Pancasila	2			14	0.00	0.00	2.00	2.00
6	FIU200	Keteknikan	Engineering and Civilization	2			14	0.00	0.00	2.00	2.00
7	TKIT161203	Arsitektur Komputer	Computer Architectures	2		14		0.00	2.00	0.00	2.00
8	TKIT161204	Pemrograman Berorientasi Objek	Object Oriented Programming	3		14		0.00	3.00	0.00	3.00
9	TKIT161204 P	Prakt. Pemograman Berorientasi Objek	Object Oriented Programming Lab. Work	1		14		0.00	1.00	0.00	1.00
											21.0
		Total		21	48	42	28	11.00	6.00	4.00	0

Sem	iester 3										
N	Course			Credit	S	ession Meeting			Ratio		Credi
0	Code	Course Name (ID)	Course Name (EN)	S	Basic	Engineerin	General	Basic	Engineerin	General	t
-					Science	g	Ed.	Science	g	Ed.	
1	TKIE162101	Matematika Diskret dan Logika	Logic and Discrete Mathematics	3	14			3.00	0.00	0.00	3.00
2	TKIE162102	Isyarat dan Sistem (Kuliah+Tutorial)	Signals and Systems (Course & Tutorial)	4	7	7		2.00	2.00	0.00	4.00
3	TKIE162102									1	
5	Р	Prakt. Isyarat dan Sistem	Signals and Systems Lab. Work	1	3	3		0.50	0.50	0.00	1.00
4	TKIE163101	Jaringan dan Komunikasi Data	Network and Data Communication	2		14		0.00	2.00	0.00	2.00
5	UNU401	Studium Generale	Studium Generale	1			14	0.00	0.00	1.00	1.00
6	TKIT162103	Sistem Operasi	Operating System	2		14		0.00	2.00	0.00	2.00
7	TKIE162103	Sistem Mikroprosesor	Microprocessor Systems	3	0	14		0.00	3.00	0.00	3.00
8	TKIT162104	Teknik Pemodelan dan Simulasi	Modeling and Simulation	2	7	7		1.00	1.00	0.00	2.00
9	TKIT162105	Teknik Basis Data	Database Engineering	2		14		0.00	2.00	0.00	2.00
10	TKIT162105									i	
10	Р	Prak. Teknik Basis Data	Database Engineering Lab. Work	1		6		0.00	1.00	0.00	1.00
										1	21.0
		Total		21	31	79	14	6.50	13.50	1.00	0

Sem	ester 4					
		Course Name (ID)	Course Name (EN)	Session Meeting	Ratio	

Ν	Course			Credit	Basic	Engineerin	General	Basic	Engineerin	General	Credi
0	Code			S	Science	g	Ed.	Science	g	Ed.	t
1		Medan Elektromagnetis (Kuliah+Tutor									
-	TKIE162201	ial)	Electromagnetic Fields (Course+Tutorial)	3	14	0		3.00	0.00	0.00	3.00
2	TKIE162201										
2	Р	Prakt. Medan Elektromagnetis	Electromagnetic Fields Lab. Work.	1	6	0		1.00	0.00	0.00	1.00
3	TKIE161203	Aljabar Linear	Linear Algebra	3	14			3.00	0.00	0.00	3.00
4	TKIE161204	Teknik Digital	Digital Technique	2	0	14		0.00	2.00	0.00	2.00
5	TKIT162205	Teknik Visualisasi Grafis	Graphical Visualization Engineering	2	3.5	10.5		0.50	1.50	0.00	2.00
6	TKIT162206	Kecerdasan Buatan	Artificial Intelligence	2		14		0.00	2.00	0.00	2.00
7	TKIT162207	Arsitektur Perangkat Lunak	Software Architecture	2		14		0.00	2.00	0.00	2.00
8	TKIT162208	Rekayasa Perangkat Lunak	Software Engineering	3		14		0.00	3.00	0.00	3.00
9	TKIT162209	Interaksi Manusia dan Komputer	Human Computer Interaction	3		14		0.00	3.00	0.00	3.00
											21.0
		Total		21	37.5	80.5	0	7.50	13.50	0.00	0

Sem	Semester 5										
N	Course			Credit	c,	Session Meeting	Ş		Ratio		Credi
0	Code	Course Name (ID)	Course Name (EN)	S	Basic	Engineerin	General	Basic	Engineerin	General	t
					Science	g	Ed.	Science	g	Ed.	
1	TKU314	Perencanaan Rekayasa	Engineering Planning	2		14		0.00	2.00	0.00	2.00
2	TKIT163101	Jaringan Komputer	Computer Networks	2		14		0.00	2.00	0.00	2.00
3	TKIT163102	Teknologi Multimedia	Multimedia Technology	2	3.5	10.5		0.50	1.50	0.00	2.00
4	TKIT163103	Teknik Antarmuka dan Periferal	Interfaces and Peripherals	2		14		0.00	2.00	0.00	2.00
5	TKIT163104	Proyek Mahasiswa	Student Project	2		14		0.00	2.00	0.00	2.00
6	TKIT163105	Interoperabilitas	Interoperability	2		14		0.00	2.00	0.00	2.00
7	TKIT163106	Sistem Terdistribusi	Distributed System	3		14		0.00	3.00	0.00	3.00
8	TKIT163101 P	Prakt, Jaringan Komputer	Computer Networks Lab. Work	1		14		0.00	1.00	0.00	1.00
	_ ·	······	Computer System	Engineerin	g (RSK)						
9	TKIE162224	Taknik Dangalahan Jawarat Digital	Digital Signal Processing Technique	2	0 ()	14		0.00	2.00	0.00	2.00
	INELOSZZ4 Teknik Pengulahan syalat Digital Digital signal Processing rechnique 5 14 0.00 5.00 100 3.00										
		Total		19	3.5	122.5	0	0.50	18.50	0.00	19.0
	Software Engineering Competency (RPL)										

9	TKIT163107	Sistem Informasi	Information Systems	3		14		0.00	3.00	0.00	3.00
											19.0
		Total		19	3.5	122.5	0	0.50	18.50	0.00	0
	Information System Engineering (RSI)										
9	TKIT163107	Sistem Informasi	Information Systems	3		14		0.00	3.00	0.00	3.00
											19.0
		Total		19	3.5	122.5	0	0.50	18.50	0.00	0

Sem	ester 6										
N o	Course Code	Course Name (ID)	Course Name (EN)	Credit s	S Basic Science	Eession Meeting Engineerin g	g General Ed.	Basic Science	Ratio Engineerin g	General Ed.	Credi t
1	TKU311	Manajemen Industri	Industrial Management	2			14	0.00	0.00	2.00	2.00
2	UNU312	Kewirausahaan	Entrepreneurship	2			14	0.00	0.00	2.00	2.00
3	TKU313	Kapita Selekta	Capita Selecta	2			14	0.00	0.00	2.00	2.00
4	TKIT163202	Keamanan dan Integritas Data	Security and Data Integrity	3		14		0.00	3.00	0.00	3.00
5		MK Pilihan	Elective Course	3		14		0.00	3.00	0.00	3.00
			Computer System	Engineerin	g (RSK)						
6	TKIT163213	Komputasi Bergerak	Wireless and Mobile Computing	3		14		0.00	3.00	0.00	3.00
7	TKIT163214	Keamanan Jaringan Komputer	Computer Network Security	3		12.833333 3	1.1666667	0.00	2.75	0.25	3.00
8	TKIT163218	Sistem Berdasar Mikroprosesor	Microprocessor-Based System	2		14		0.00	2.00	0.00	2.00
		Total		20	0	68.833333 3	43.166666 7	0.00	13.75	6.25	20.0 0
			Software Engineering	g Compete	ncy (RPL)						
6	TKIT163225	Ekonomi dan Bisnis Informasi	Economics and Bussines of Information	2		12.25	1.75	0.00	1.75	0.25	2.00
7	TKIT163226	Kualitas Perangkat Lunak	Software Quality	3		14		0.00	3.00	0.00	3.00
8	TKIT163229	Integrasi Aplikasi dan Informasi	Applications and Information Integration	3		14		0.00	3.00	0.00	3.00
		Total		20	0	68.25	43.75	0.00	13.75	6.25	20.0 0
			Information System	Engineeri	ng (RSI)						
6	TKIT163225	Ekonomi dan Bisnis Informasi	Economics and Bussines of Information	2		12.25	1.75	0.00	1.75	0.25	2.00
7	TKIT16337	Keamanan Sistem Informasi	Information Systems Security	3		14		0.00	3.00	0.00	3.00

8	TKIT163229	Integrasi Aplikasi dan Informasi	Applications and Information Integration	3		14		0.00	3.00	0.00	3.00
											20.0
	Total			20	0	68.25	43.75	0.00	13.75	6.25	0

Sem	Semester 7												
No	Course Code	Course Name (ID)	Course Name (ENI)	Crodits		Session Meeting			Ratio		Crodit		
NU	course coue	course Name (ID)	Course Name (LN)	creats	Basic Science	Engineering	General Ed.	Basic Science	Engineering	General Ed.	Creuit		
1	TKIE164101	Proposal Skripsi	Thesis Proposal	2		14	0	0.00	2.00	0.00	2.00		
2	FIU40x	Agama	Religion	2			14	0.00	0.00	2.00	2.00		
3	UNU310	Kewarganegaraan	National Resilience	2			14	0.00	0.00	2.00	2.00		
4	TKIE164102	Kerja Praktik	Internship -	2		14	0	0.00	2.00	0.00	2.00		
5		MK Pilihan	Elective Course	6		28		0.00	6.00	0.00	6.00		
		Total		14	0	56	28	0.00	10.00	4.00	14.00		

Semester 8												
No	Course Code	Course Name (ID)	Course Name (EN)	Cradita		Session Meeting			Ratio		Cradit	
NU	Course Coue		Course Marile (EN)	Credits	Basic Science	Engineering	General Ed.	Basic Science	Engineering	General Ed.	Cleuit	
1	UNU500	Kuliah Kerja Nyata	Community Development	3			14	0.00	0.00	3.00	3.00	
2	TKIE164201	Skripsi dan Pendadaran	Thesis and Oral Examination	4		14	0	0.00	4.00	0.00	4.00	
		Total		7	0	14	14	0.00	4.00	3.00	7.00	

Jum	lah								
No	Concentration	Credit		Session Meeting			Ratio		Credit
NO	concentration	credit	Basic Science	Engineering	General Ed.	Basic Science	Engineering	General Ed.	creat
1	Computer System Engineering (RSK)	144	162	510.8333333	141.1666667	35.50	88.25	20.25	144
2	Software Engineering Competency (RPL)	144	162	510.25	141.75	35.50	88.25	20.25	144
3	Information System Engineering (RSI)	144	162	510.25	141.75	35.50	88.25	20.25	144

Elec	tive Course										
N	Course			Crodit	S	Session Meeting			Ratio		Crodi
0	Kode	Course Name (ID)	Course Name (EN)	s	Basic	Engineerin	General	Basic	Engineerin	General	t
					Science	g	Ed.	Science	g	Ed.	
			G	ieneral							
1	TKIT165201		Special Topics for Information								
		Topik Khusus Teknologi Informasi	Technology	3		14		0.00	3.00	0.00	3.00
2	1K11165101	Pengalaman Pengguna	User Experience	3		14		0.00	3.00	0.00	3.00
3	TKIT165202										
		TIK dan Masyarakat	ICT and Society	3		14		0.00	3.00	0.00	3.00
4	TKIT165102	Audit TI dan Tata Kelola Resiko	IT Audit and Risk Management	3		14		0.00	3.00	0.00	3.00
			Computer Syste	em Enginee	ring (RSK)	1			1	L	4
-	TKIT165211										
2		Pengolahan Citra dan Visi Komputer	Image processing and Computer	3		14		0.00	3.00	0.00	3.00
6	TKIT165111	Talvallı Kamanasi Data	Data Companyation Taskainus	2		1.4		0.00	2.00	0.00	2.00
	TKIT165212	Teknik Kompresi Data	Data compression rechnique	3		14		0.00	3.00	0.00	3.00
7	1005212	Sistem Berbasis Internet of Things	Systems Based Internet of Things	3		14		0.00	3.00	0.00	3.00
8	TKIT165112	Sistem Komunikasi Bergerak	Mobile Communications System	3		14		0.00	3.00	0.00	3.00
			Software Enginee	ring Compe	tency (RPI)						
-	TKIT165221	Pengembangan									T
5		Aplikasi Piranti Bergerak	Mobile Application Development	3		14		0.00	3.00	0.00	3.00
6	TKIT165121			_							
	TKIT105222	Pengembangan Aplikasi Permainan	Game Application Development	3		14		0.00	3.00	0.00	3.00
7	TKI1165222	Pengujian Perangkat Lunak	Software Testing	3		14		0.00	3.00	0.00	3.00
	TKIT165122										
0		Aplikasi Berbasis Web	Web Based Application	3		14		0.00	3.00	0.00	3.00
			Information Sys	tem Engine	ering (RSI)						
5	TKIT165131	Die Date das Assilit						0.00	2.00	0.00	2.00
	TVIT165221	Big Data dan Analitik	Big Data and Analytic	3		14		0.00	3.00	0.00	3.00
6	111103231	Analisis dan Desain Sistem Informasi	Analysis and Design of Information	3		14		0.00	3.00	0.00	3.00
7	TKIT165132										
Ļ,	TKIT4 (5222	Sistem Pendukung Keputusan	Decision Support System	3		14		0.00	3.00	0.00	3.00
8	TKI1165232	Sistem Berbasis Enterprise	Enterprise-Based System	3		14		0.00	3.00	0.00	3.00

Curriculum Matrix

The Curriculum of Information Engineering Program offers three concentrations/options:

- 1. Software Engineering
- 2. Information Systems Engineering, and
- 3. Computer Systems Engineering

These concentrations are more of a sharpening and deepening of the material from the substance of the study that students have acquired through required courses. The selection of concentrations for students is not a total separation between the three concentrations.



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Curriculum Compatibility

The Curriculum 2016 is a major improvement from curriculum 2011. The curriculum 2016 is applied in 2016. Therefore, the students' years 2014/2015 will need to understand the changes and compatibility between courses.

NO		2011			2016	
	Sem	Course Name	Cred.	Sem	Course Name	Cred
1	1	Bahasa Inggris/ English Language	2		Changes	
2	1	Matematika Teknik/ Engineering Mathematics	3	1	Matematika Teknik (Kuliah+Tutorial)/ Engineering Mathematics (Course+Tutorial)	3
3	1	Matematika Diskrit/ Logic and Discrete Mathematics	3	3	Matematika Diskret dan Logika/ Logic and Discrete Mathematics	3
4	1	Pemrograman Dasar/ Fundamentals of Programming	3	1	Pemrograman Dasar/ Fundamentals of Programming	3
5	1	Fisika Elektro/ Electrical Engineering Physics	3	1	Fisika Elektro (Kuliah+Tutorial)/ Electrical Engineering Physics (Course+Tutorial)	4
6	1	Pengantar Teknologi Informasi/ Introduction to Information Technology	2	1	Pengantar Teknologi Informasi/ Introduction to Information Technology	2
7	1	Teknik Digital/ Digital Technique	2	4	Teknik Digital/ Digital Technique	2
8	1	Prakt. Pemrograman Dasar/ Fundamentals of Programming Work Lab	1	1	Prakt. Pemrograman Dasar/ Fundamentals of Programming Work Lab	1

NO		2011			2016	
	Sem	Course Name	Cred.	Sem	Course Name	Cred
1	2	Teknik Pemodelan dan Simulasi/ Modellling and Simulation	3	3	Teknik Pemodelan dan Simulasi/ Modellling and Simulation	2
2	2	Teknik Komputer Dasar/ Basic Computer Engineering	2	5	Interoperabilitas / Interoperability	2
3	2	Teknik Telekomunikasi/ Telecommunications Engineering	2	3	Isyarat dan Sistem (Kuliah+Tutorial)/ Signals and	4
4	2	Pengantar Teknik Elektronika/ Introduction to Electronics Engineering	2		Systems (Course & Lutorial)	
5	2	Algoritma dan Struktur Data/ Algorithm and Data Structures	3	1	Algoritme dan Struktur Data/ Algorithm and Data Structures	3
6	2	Probabilitas dan Statistik/ Probability and Statistics	2	1	Probabilitas dan Statistika/ Probability and Statistics	3
7	2	Prakt. Pengolahan Data Statistik/ Statistical Data Processing Lab Work	1			
8	2	Teknik Komputasi/ Computational Technique	3	2	Metode Numeris (Kuliah+Tutorial)/ Numerical Methods (Course+Tutorial)	3
9	2	Prakt. Teknik Komputasi/ Computational Technique Lab Work	1	2	Prakt. Metode Numeris/ Numerical Methods Lab Work	1

NO		2011			2016	
	Sem	Course Name	Cred.	Sem	Course Name	Cred
1	3	Pemrograman Berorientasi Obyek/ Object Oriented Programming	3	2	Pemrograman Berorientasi Objek/ Object Oriented Programming	3
2	3	Teknologi Basis Data/ Database Engineering	3	3	Teknik Basis Data/ Database Engineering	2
3	3	Teknologi Piranti Elektronika/ Electronic Device Technology	2		Removed	
4	3	Jaringan dan Komunikasi Data/ Network and Communication Data	2	3	Jaringan dan Komunikasi Data/ Network and Communication Data	2
5	3	Sistem Operasi/ Operating System	3	3	Sistem Operasi/ Operating System	2
6	3	Asas Sistem Komunikasi/ Fundamental of Communication Systems	2		Removed	
7	3	Sistem Mikroprosesor/ Microprocessor Systems	3	3	Sistem Mikroprosesor/ Microprocessor Systems	3
8	3	Prakt. Teknik Digital/ Prakt. Digital Engineering	1		Removed	
9	3	Prakt. Elektronika/ Prakt. Electronics	1		Removed	

NO		2011		2016					
	Sem	Course Name	Cred.	Sem	Course Name	Cred			
1	4	Organisasi dan Arsitektur Komputer/ Computer Architectures	3	2	Arsitektur Komputer/ Computer Architectures	2			
2	4	Teknik Visualisasi Grafis/ Graphical Visualization Engineering	3	4	Teknik Visualisasi Grafis/ Graphical Visualization Engineering	2			
3	4	Kecerdasan Buatan/ Artificial Intelligence	2	4	Kecerdasan Buatan/ Artificial Intelligence	2			
4	4	Ekonomi dan Bisnis Informasi/ Economics and Business of Information	2	6	Ekonomi dan Bisnis Informasi/ Economics and Business of Information	2			
5	4	Rekayasa Perangkat Lunak/ Software Engineering	3	4	Rekayasa Perangkat Lunak/ Software Engineering	3			
6	4	Teknik Komputer Interaktif/ Interactive Computer Engineering	3	4	Interaksi Manusia dan Komputer/ Interactive Computer Engineering	3			
7	4	Jaringan Komputer/ Computer Networks	3	5	Jaringan Komputer/ Computer Networks	2			
8	4	Prakt. Mikroprosesor dan Komputer/ Microprocessors and Computers Lab Work	1		Removed				
9	4	Prakt. Telekomunikasi Dasar/ Telecommunication Basics Lab Work	1	3	Prakt. Isyarat dan Sistem/ Signals and Systems Lab Work	1			

NO		2011	1 2016			
	Sem	Course Name	Cred.	Sem	Course Name	Cred
1	5	Pancasila	2	2	Pancasila	2
2	5	Teknik Antarmuka dan Periferal/ Interfaces and Peripherals	3	5	Teknik Antarmuka dan Periferal/ Interfaces and Peripherals	2
3	5	Teknologi Multimedia/ Multimedia Technology	2	5	Teknologi Multimedia/ Multimedia Technology	2
4	5	Sistem dan Keamanan Informasi/ Information Systems and Security	3	6	Keamanan Sistem Informasi/ Information Systems and Security	3
5	5	Sistem Terdistribusi/ Distributed System	3	5	Sistem Terdistribusi/ Distributed System	3
6	5	Perencanaan Rekayasa/ Engineering Planning	2	5	Perencanaan Rekayasa/ Engineering Planning	2
7	5	Prakt. Pemrograman Berorientasi Obyek/ Object Oriented Programming Lab Work	1	2	Prakt. Pemograman Berorientasi Objek/ Object Oriented Programming Lab Work	1
8	5	Prakt. Basis Data/ Database Engineering Lab Work	1	2	Prak. Basis Data/ Database Engineering Lab Work	1

NO		2011			2016	
	Sem	Course Name	Cred.	Sem	Course Name	Cred
1	6	Kewarganegaraan/ National Resilience	2	7	Kewarganegaraan/ National Resilience	2
2	6	Kewirausahaan/ Entrepreneurship	2	6	Kewirausahaan/ Entrepreneurship	2
3	6	Manajemen Industri/ Industrial Management	2	6	Manajemen Industri/ Industrial Management	2
4	6	Pemrograman Jaringan dan Web/ Network and Web Programming	3	5/6	Aplikasi Berbasis Web/ Network and Web Programming	3
5	6	Proyek Mahasiswa/ Student Project	3	5	Proyek Mahasiswa/ Student Project	2
6	6	Metode Penelitian & Teknik Presentasi/ Research Methods & Presentation Techniques	1	1	Penulisan Laporan dan Karya Ilmiah/ Scientific Writing and Reporting	2
7	6	Prakt. Jaringan Komputer/ Computer Network Lab. Work	1	5	Prakt. Jaringan Komputer/ Computer Network Lab. Work	1
8	6	Prakt. Sistem Telekomunikasi/ Telecommunication System Lab Work	1		Removed	

NO		2011		2016		
NO	Sem	Course Name	Cred.	Sem	Course Name	Cred
1	7	Agama/ Religion	2	7	Agama/ Religion	2
2	7	Studium General	1	7	Studium General	1
3	7	Kerja Praktik/ Internship	2	7	Kerja Praktik/ Internship	2
4	7	Komputer dan Masyarakat/ Computers and Communities	3	5/6	TIK dan Masyarakat/ ICT and Society	3
5	7	Sistem Berbasis Pengetahuan/ Knowledge-Based Systems	2		Converted into others course to fulfil BOK	

NO		2011		2016		
	Sem	Course Name	Cred.	Sem	Course Name	Cred
1	8	KKN/ Community Development	3	8	Kuliah Kerja Nyata/ Community Development	3
2	8	Skripsi/ Thesis	4	7	Proposal Skripsi/ Thesis Proposal	2
				8	Skripsi dan Pendadaran/ Thesis and Oral Examination	4
3	8	Pendadaran/ Oral Examination	2			

	Selected E	lective (Conc	entration Elective)	
No	Course Name	Credits	Course Name	Credits
1	Topik Khusus Teknologi Informasi/ Special Topics for Information Technology	3	Topik Khusus Teknologi Informasi/ Special Topics for Information Technology	3
2	Aplikasi Berbasis Web/ Web Application Development	3	Aplikasi Berbasis Web/ Web Application Development	3
3	Pengembangan Aplikasi Mobile/ Mobile Application Development	3	Pengembangan Aplikasi Piranti Bergerak/ Mobile Application Development	3
4	Integrasi Aplikasi dan Informasi/ Applications and Information Integration	3	Integrasi Aplikasi dan Informasi/ Applications and Information Integration	3
5	Data Warehousing dan Data Mining/ Data Warehousing and Data Mining	3	<i>Big Data dan Analitik/</i> Big Data and Analytic	3
6	Riset Operasi/ Operational Research	3	Removed	
7	Manajemen Sistem Informasi/ Management Information System	3	Sistem Informasi/ Information System	3
8	Pengembangan Aplikasi Permainan/ Game Application Development	3	Pengembangan Aplikasi Permainan/ Game Application Development	3
9	Sistem Pendukung Keputusan/ Decission Support System	3	Sistem Pendukung Keputusan/ Decision Support System	3
10	Teknik Pengolahan Citra/ Image Processing	3	Pengolahan Citra dan Visi Komputer/ Image processing and Computer	3
11	Teknik Kompresi Data/ Data Compression Technique	3	Kompresi Data/ Data Compression	3
12	Manajemen Jaringan Komputer/ Management Computer Network	3	<i>Keamanan Jaringan Komputer /</i> Computer Network Security	3
13	Sistem Berdasar Mikroprosesor/ Microprocessor-Based System	3	Sistem Berbasis Mikroprosesor/ Microprocessor-Based System	2
14	Embedded System	3	Converted into free elective	
15	Sistem Komunikasi Bergerak/ Mobile Communications System	3	Sistem Komunikasi Bergerak/ Mobile Communications System	3

Transitional rules that apply are as follows:

- a. All the CREDITS that have been reached are recognized by the number of CREDITS on 2011 curriculum.
- b. The student attended the course in the first run by the table of curriculum 2016.
- c. Courses have been taken at the last semester of the curriculum based on 2011 when having the same name with the courses in the curriculum as indicated in Table is a substitute, no need to traverse.
- d. Students who wish to improve the value of specific subjects can be attended by the table of course substitute. The material, the number of semester CREDITS, and the implementation of new curriculum adapt to the lecture.

- e. When Students have already taken the course before the semester obligations run and have already written off the value of the course is still recognized and being part of the graduation requirement 144 SKS.
- f. The courses referred to in do not have equality with subjects on the curriculum of 2016. The student should take the courses based on the years. For example, discrete mathematics and linear algebra by the student is obligated to host 2015 considering the courses listed in the semester three and four tables. However, the course is not mandatory is 2014 and before. And so on.
- g. Environmental subjects are compulsory for the entire host or adjust to the rules of the Faculty of engineering Gadjah Mada University.
- h. Other matters that have not been listed in these transitional rules can be consulted with professors of the academic supervisor or Chairman and Secretary of the Study Program.
- i. Repair value of courses already no or different loads his SKS will be given the opportunity for improvement in the form of Remedy. Remedy transition will be held in one year to the next since it was enacted and performed at each change of semester
- j. Lab works, which changed its position then it will still be held in the first half to support the transition, in the next semester Lab work will be conducted as scheduled.
- k. For students who are in the process of taking a proper thesis proposal submission, pending a review of the proposal, or start his thesis is obligated to make these proposals to meet the needs of his CREDITS. A thesis proposal is face-to-face courses contain a discussion with supervision directly with a supervisor the value of end is the value of the quality of the paper proposals and determined its value by supervising the first value is discussed with the second supervisor

V. Course Summaries

SEMESTER 1

	7////
Course Code	TKIE161101
Course Name	Engineering Mathematics (Course + Tutorial)
Course Description	Capability of understanding and applying fundamentals of mathematics, such as Function, Limit, Derivative, Integral, Sequence and Series, and Complex Number, also modelling and mathematical analysis for real problems.
Course Code	TKIE161102
Course Name	Physics for Electrical Engineering (Course + Tutorial)
Course Description	This course is a physic freshman course with emphasis in the fundamental concepts, laws and theories of electromagnetism. The explanation of these concepts is tailored to be relevant in the context of electrical engineering and information technology.
Course Code	TKIE161103
Course Name	Fundamental of Programming
Course Description	This course will discuss about program development steps ranging from defining problems to be solved, determining program inputs and outcomes and determining processing steps by utilizing operators and operands, data types and structures, programming controls and some programming strategies and modularity. This course will also discuss how the program runs on a computer system and how to evaluate and validate programs by utilizing debugging and compilers. This lecture will utilize the procedural programming paradigm represented by the C programming language.
Course Code	TKIE161103
Course Name	Fundamental of Programming Lab Work

CourseThe main purpose of this course is to encourage students' technical and analyticalDescriptionskills in implementing basic programming concepts to solve various problems.

Course Code TKIE161105

Course Name Algorithms and Data Structures

CourseStudents can understand, analyze and implement algorithmic techniques and dataDescriptionstructure in programming including searching algorithm, sorting algorithm and
various data structures.

Course Code TKIT161104

Course Name Introduction to Information Technology

CourseDiscuss all aspects of information technology: data and information, computerDescriptionsystems composed of hardware and software as well as its surrounding topics such
as data processors, information systems, computer networks,
telecommunications and the Internet as information distributors. As well as users
or developers. Learned also the history of IT development and trends, IT
utilization and management with respect to security and ethics, career in the IT
world, and IT development process.

Course Code TKU100

Course Name Scientific Writing and Reporting

CourseThis course contains basic theories that are useful for proper scientific paperDescriptionwriting and works, including techniques for conducting a research. Learning
focuses on discussion and practice of paper writing using good and correct English.
Students are expected to do the writing of scientific papers and work well and
correctly, and able to conduct research in a proper way.

Course Code	TKU125
Course Name	Probability and Statistic
Course Description	In this course, the students study about the theoretical concept and simple applications related to probability theory, data analysis, and statistics.

SEMESTER 2

Course Code

Course Code	FIU200
Course Name	Engineering and Civilization
Course Description	This course explains the soul and the role of engineering. It gives understanding of the big picture of engineering in human civilization. Also it reveals the ethical aspect of engineering.

Course Name	Electrical Engineering Mathematic	Course + Tuto	rial)

TKIE161201

CourseDescribes the principles of Vectors and Vector Spaces, Vector Differential Calculus,DescriptionCurve Integral, Surface Integral, Analytic Functions, Elementary Functions,
Complex Integral, Complex Series, and Residue Techniques.

Course CodeTKIE161202Course NameEngineering PhysicsCourseEngineering Physics Course learns concepts and theories related to Unit System,
Kinematics, Statics, Dynamics, Mechanics, Heat, Fluid Mechanics, Waves, Light
and Optical Systems, Light Particle Properties.

Course Code TKIE162202

Course Name Numerical Method (Course + Tutorial)

CourseThis course introduce various solving technique related to mathematicalDescriptionmodelling, including solving linear equations using direct and indirect methods,
root solver, concept of vector and matrix, and optimization.

Course Code TKIE162202P

Course Name Numerical Method Lab Work

CourseDescribes the principles of Vectors and Vector Spaces, Vector Differential Calculus,DescriptionCurve Integral, Surface Integral, Analytic Functions, Elementary Functions,
Complex Integral, Complex Series, and Residue Techniques.

Course Code TKIT161203

Course Name Computer Architectures

CourseThe introduction and understanding of the architectural approaches applied to the
design of modern computers, and their effect on the performance of computer
system. Concepts used in computer architecture find application in other courses.
In particular, the way in which the computer provides architectural support for
programming languages and operating system facilities reinforces concepts from
those areas.

Course Code TKIT161204

Course Name Object Oriented Programming

CourseThis course will discuss object oriented programming that applicable to solveDescriptioncomplex program in engineering.

Course Code	TKIT161204P
Course Name	Lab Work Object Oriented Programming
Course Description	This course will discuss object-oriented programming that applicable to solve complex program in engineering.
Course Code	FIU300
Course Name	Pancasila
Course Description	This course explains all about Pancasila as a national ideology and its applications

Course Code	TKIE162103
Course Name	Microprocessor Systems
Course Description	Describes the basic architecture of microprocessor, arithmetic logic unit (ALU), control unit (CU), register, memory, control path, data path, memory addressing modes, input-output (I / O), instruction-set, machine language, assembly, and assembler.
Course Code	TKIE163101
Course Name	Network and Data Communications
Course	After following this course students are expected to have sufficient principle to
Description	in this field independently.
Description Course Code	in this field independently. TKIE162102P
Description Course Code Course Name	 TKIE162102P Signals and System Lab Work
Description Course Code Course Name Course Description	 design, 43halyse, and compute the data network system to develop knowledge in this field independently. TKIE162102P Signals and System Lab Work This lab work goal is to improve the understanding of student on fundamental signal and system theory, for example convolution, ODE, frequency response, LTI system, and Discrete Time-based System
Description Course Code Course Name Course Description Course Code	 design, 43halyse, and compute the data network system to develop knowledge in this field independently. TKIE162102P Signals and System Lab Work This lab work goal is to improve the understanding of student on fundamental signal and system theory, for example convolution, ODE, frequency response, LTI system, and Discrete Time-based System TKIE 162102
Description Course Code Course Name Course Description Course Code Course Name	 design, 43halyse, and compute the data network system to develop knowledge in this field independently. TKIE162102P Signals and System Lab Work This lab work goal is to improve the understanding of student on fundamental signal and system theory, for example convolution, ODE, frequency response, LTI system, and Discrete Time-based System TKIE 162102 Signals and Systems

Course Code	TKIT162101		
Course Name	Discrete Mathematics and Logic		
Course Description	This course will discuss the fundamental of logic and discrete mathematics that applicable to solve the complex problem in engineering.		
Course Code	TKIT162103		
Course Name	Operation System		
Course Description	This course will describe the concepts and backgrounds of operating system including: basic structure of computer system, operating system structure, process, thread, SMP, microkernels, mutual exclusion synchronization, deadlock, starvation, memory management, virtual memory, single processor, process scheduling on multiprocessor, real-time process scheduling, I / O management, and file management.		
Course Code	TKIT162104		
Course Name	Modelling and Simulation		
Course Description	This course deals with model modelling and dynamic system modelling. It includes "Data-Driven Models", "Monte Carlo Simulations"; and "Agent-Based Modelling." In addition, advanced simulation techniques will also be of concern in this course		
Course Code	TKIT162105P		
Course Name	Database Engineering Lab Work		
Course Description	In this course, student will learn and apply the logical and physical design, and how to implement the design in the database management system.		
Course Code	TKIT162105		
Course Name	Database Engineering		
Course Description	In this course, student will learn and apply the logical and physical design, and how to implement the design in the database management system.		
Course Code	UNU401		
Course Name	Studium Generale		
Course Description	Many graduates face difficulty to transition from university life to professional one. Expectation from "users" is high that graduates, on top of their respective technical subject, possess basic competency to manage themselves and their relationship with supervisor and colleagues at work. Not only impacting at work		

efficiency and relationship quality, this non-technical competency is actually critical determinant to performance.

- Course Code TKIE161203
- **Course Name** Linear Algebra
- CourseThis course discusses vector and matrix theory, its role as presentations of
geometry, and how this theory can be used to solve mathematical model. The
mathematical model can generally be formulated based on some engineering
problems.
- Course Code TKIE162201
- **Course Name** Electromagnetic Field (Course+Tutorial)
- CourseUnderstand the basic concepts of Electromagnetic Fields include: Concept of FieldDescriptionand Vector Calculus, Coordinate System, Electrical Field Theory, Electric Current,
Magnetic Field Theory, Electrical and Magnetic Material, Hysteresis,
Electromagnetic Boundary Condition, Electromagnetic Induction, Inductance,
Capacitance, Resistance, Ampere's Law, Faraday's Law, Gauss' Law, Ohm, Joule's
Law, Magnetic Circuit, Transmission Line, Maxwell's Equation, Electromagnetic
Waves.
- Course Code TKIE162201P
- Course Name Electromagnetic Field Lab Work
- CourseThis laboratory work is focused on understanding fundamental concept ofDescriptionelectromagnetic fields.

Course Code	TKIT162205
Course Name	Graphical Visualization Engineering
Course Description	Learn the basic concepts of graphical math and its relation in designing realistic graphical objects by considering lighting and shadow models.
Course Code	TKIT162206
Course Name	Artificial Intelligence
Course Description	Understanding the definition, history, taxonomy, and examples of its application.

Course Code	TKIT162208
Course Name	Software Engineering
Course Description	This course aimed to introduce students on various knowledge and technique regarding software engineering. Furthermore, students are expected to understand several concept to analyse software, project management, and scheduling.
Course Code	TKIT162209
Course Name	Human Computer Interaction
Course Description	Understanding the concept of human and computer interaction through a variety of interfaces and factors that affect the interaction (human factor),
Course Code	TKIT163101
Course Name	Computer Network
Course Description	This course will discuss computer network focusses on OSI layer and protocols related to each layer. Students will use simulation tools to implement networking concept during the course.
Course Code	TKIE161203
Course Name	Linear Algebra
Course Description	This course discusses vector and matrix theory, its role as presentations of geometry, and how this theory can be used to solve mathematical model. The mathematical model can generally be formulated based on some engineering problems.

Course Code	TKIT163107	
Course Name	Information Systems	
Course Description	This course learn about understanding of Information System covering information system ecosystem, types and usefulness of Information System in organization and company.	
Course Code	TKEE163121	
Course Name	Digital Signal Processing	
Course Description	Digital signage processing applications are growing very rapidly in various fields. such as biomedical, sonar, radar, seismology, audio, video, speech, telecommunication and other fields. Understanding of the fundamentals and	

techniques of digital signaling is an essential requirement to know, understand and develop the applications.

Course Code	TKIT163101
Course Name	Computer Network
Course Description	This course will discuss computer network focusses on OSI layer and protocols related to each layer. Students will use simulation tools to implement networking concept during the course.
Course Code	TKIT163101P
Course Name	Computer Network Lab. Work
Course Description	This course will discuss computer network focusses on OSI layer and protocols related to each layer. Students will use simulation tools to implement networking concept during the course.
Course Code	TKIT163102
Course Name	Multimedia Technology
Course Description	Able to understand the concept of multimedia data both analogue and digital, multimedia data compression model and its manipulation.
Course Code	TKIT163103
Course Name	Interfaces and Peripherals
Course Description	This course deals with trends, theories and concepts, the implementation along with the utilization of peripheral devices and interfaces in information technology. The working principle of input and output (Input / Output, I / O) and electronic hardware are discussed in class
Course Code	ТКІТ163104
Course Name	Student Project
Course Description	This course combines aspects of professionalism and technopreuner. This course will enhance students' understanding of planning, organizing, securing, and managing the goals of a project. At this stage the aspects of project management, aspects of risk management, as well as aspects of business management.
Course Code	TKIT163105
Course Name	Interoperability

CourseThis course aims to deliver fundamental knowledge on interoperability, on variousDescriptionlevel, such as data, application, architecture and services level. Furthermore, this
course also provide some of up-to-date example of framework that support
interoperability.

- Course Code TKIT163106
- Course Name Distributed System

Course Computer networks as distributed systems infrastructure, techniques and support Description in the management of distributed systems, and software and application components. Computer network material discusses generally about network components and how they work. Material engineering and distributed systems management support discusses distributed file systems, replication techniques, and transaction handling and concurrency. Topics of software and application components discuss the web as a distributed computing platform, interoperability issues, and examples of distributed computing architectures.

- Course Code TKU314
- **Course Name** Engineering Planning

CourseEngineering Planning course put forward Capstone Design Project method with
case example in lecture. It is expected that after students complete this course
students are able to apply and design an effective product and the principles of
applicable standards in the field of engineering.

Course Code	TKIT163202
Course Name	Security and Data Integrity
Course Description	The Data Security and Data Integrity course is a continuation of the Information Systems and Computer Network Security course. This course starts on the basics of securing information systems in general as an introduction and focus in more specific security areas, data integrity in the database or on the file system.
Course Code	TKIT163214
Course Name	Computer Network Security
Course Description	Learn the concepts and terminology of computer network security system, System Security Model, Cryptography Algorithm
Course Code	TKEE163222
Course Name	Microprocessors Based Systems

- CourseThis course aims to give students the ability to understand the concept of
microcontroller based systems, understand the constituent elements, how it
works, to be able to make it independently. The learning process is done by
lecturing, simulation using software, and practice directly by using evaluation
board
- Course Code TKIT163225
- **Course Name** Economics and Bussiness of Information
- CourseThis course learns about information as the main thruster of the new economicDescriptionorder in globalization era. There are new arrangements that are formed because
of the massive use of such information. Information has become a commodity that
has economic value and open new business opportunities, especially with the
development of information and communication technology.
- Course Code TKIT163226
- Course Name Software Quality
- CourseAs a product, software (software) has a distinctive feature that distinguishes itDescriptionfrom other products. This causes the software to have certain criteria in defining
its quality, and software development is also run with a different approach than
the manufacture of other physical products. This course discusses the
characteristics of software and its development related to the quality aspect, and
from those two things the concept of quality, its implementation, its
measurement, and its testing are discussed.
- Course Code TKU311
- **Course Name** Industrial Management
- CourseThis course discuss several aspect of industrial standard across of engineeringDescriptionfield. Students will be able to understand realistic constraint on industrial and
manage the complexity through project management standar
- Course Code TKIT16337
- **Course Name** Information System Security
- CourseStudents learn, understand the System and Information Security Course isDescriptionexpected to be able to explain the concepts and principles of sieten and
information security, able to analyze, design, manage information security,
evaluate / auditing information security system based on information security
standard

Course Code TKIT163101P

Course Name Computer Network Lab. Work

CourseThis course will discuss computer network focusses on OSI layer and protocolsDescriptionrelated to each layer. Students will use simulation tools to implement networking
concept during the course

Course Code TKIT163213

Course Name Wireless and Mobile Computing

CourseThis course discusses the principle of mobile computing with regard to
communication, transmission and wireless networks. The material is divided into
four major themes: (1) the basic concept of mobile computing and its problems,
(2) wireless and mobile networks, (3) wireless and mobile communications and (4)
mobile communication protocols

Course Code TKIT163228

Course Name Integration Application & Information

CourseThis course will discuss about integration architecture and method onDescriptioninformation engineering domain.

Course Code UNU312

Course Name Entrepreneurship

CourseStudents understand the need to consider the economic aspect of engineering and
able to do basic economic calculations related to engineering (engineering
economy). Able to conduct business feasibility studies / projects and can create a
business plan (business plan). In addition students have a broader vision of self-
development and are motivated to be creative and innovative and become an
entrepreneur.

Course Code TKU313

Course Name Capita Selecta

CourseKapita Selekta is a continuation of Studium General. Kapita Selekta educatesDescriptionstudents about non-technical knowledge in the general public including the
world of work / entrepreneur that must be understood by an engineer.

SEMESTER 7

Course Code FIU400

Course Name Islam

CourseThis course discusses the basic concepts and implementation of Islamic ReligionDescriptionin relation to the profession in the world of science and technology.

Course Code	FIU401
Course Name	Catholic Religion
Course Description	This course studies the understanding of the dignity of the human person before God, the understanding and experience of revelation and faith according to the Catholic Church, the values of chastity and the social doctrine of the church.
Course Code	TKIE164101
Course Name	Thesis Proposal
Course Description	Students have the ability of oral and written to describe thesis topics that have value from the point of view of problems, solutions, and structured methods that are prepared and guided by supervisors.
Course Code	TKIE164102
Course Name	Industrial Internship
Course Description	Practical work is a subject of application of science that has been studied by students in lecturing process in real cases in industry.
Course Code	UNU310

Course Name National Resilience

CourseThis course discusses the issue of Indonesian citizens in their roles and
responsibilities to the nation and state. The subjects cover the concepts of citizens
and nations, human rights, rights and duties of citizens, defending the nation and
state, democracy, insight of the archipelago, and national resilience.

SEMESTER 8

Course Code IKIE164201	Course Code	TKIE164201
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Course Name Thesis and Oral Examination

CourseThesis and oral examination is a final course in the student's field of study as wellDescriptionas a defense of the thesis. The student should meet at least 10 sessions of thesis
discussion before to go the oral examination. The department is required to post
prominently the date, time, and place of the oral examination after the student
fulfil the needs

Course Code	TKIE164201
Course Name	Community Services
Course Description	Community services is a research-based community service that is obligatory for students at Universitas Gadjah Mada. The main focuses community services purposes is to provide any useful activity for the society around Indonesia.

ELECTIVE COURSE

Course Code	TKIT165101
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Course Name User Experience

CourseThis course aims to provide an understanding of the concept of user experienceDescription(UX), aspects affecting UX, interface and interface, and the methods used. In
addition, they also learned some things related to: field assignments (surveys),
classroom discussion, prototype software development, and user device
prototypes to users.

- Course Code TKIT165102
- Course Name IT Audit and Risk Manajement

CourseLearning the IT Audit, the Concept of Information Risk Management and theDescriptionBusiness Continuity Plan, Identify the criticality of the Assetification of Threat and
Vulnerability of the risk, Control analysis, Possible risk / Risk of occurrence criteria,
Criteria Measurement of impact level, Determination of basic risk value, Risk
Control, Making Risk Treatment Plan, Risk Monitoring, Disaster Recovery Plan.

- Course Code TKIT165111
- Course Name Data Compression Technique

CourseIn this course we will discuss everything related to various basic techniques ofDescriptioncompressing data. The limitation of the width of the transmission medium used to
channel information causes people to look for ways for large information to be
transmitted and well received on the receiving end. It can be done by compressing
the data to be sent.

Course Code TKIT165122

Course Name Game Development

CourseThis course discusses a software engineering model based on game applications.DescriptionThis course will focus on the process and method of developing game applications.
This course will discuss the historical aspects, aspects of software development

engineering, technical aspects of development, and pragmatic aspects of the publication and design of gaming applications.

- Course Code TKIT165122
- **Course Name** Web Application Development
- CourseThis course discusses one of the software technology platforms known as WebDescriptiontechnology. This course will discuss a collection of previous and current research
findings that became the forerunner of web technology evolution. This course will
provide knowledge on the background of web technologies, web implementation
on the community, and technical skills to develop and implement web
technologies in case studies to be studied in this course.
- Course Code TKIT165131
- Course Name Big Data and Analytic
- CourseThis course study about understanding Big Data and Analitik cover HadoopDescriptionecosystem, MapReduce, and tools used in processing big data and analytical
method that is used to find value or knowledge of big data for decision making.
- Course Code TKIT165132
- Course Name Decision Support System
- CourseThis course provides a basic understanding of decision making withinDescriptionorganizations and the use of computer-based systems to support decision-making.
By following this course students are expected to understand and be able to apply
the concept of decision making within the organization, utilizing computer-based
systems to support decision making, and also able to develop a simple SPK.
- Course Code TKIT165201
- **Course Name** Specials Topics for Information Technology
- CourseTopics Special Topics Information Technology discusses special topics (IT topics) in
the field of IT aimed at a particular interest or is becoming a trend. These special
topics need to be studied further and deeper so that the description of the scope
and specificity of information technology applications can be better understood.
The material outline is emphasized on the types of information technology and its
characteristics, uses, and components that exist in each of these types and
methods of development.

Course Code	TKIT165202
Course Name	ICT and Society
Course Description	This course will discuss the other side of ICT, the social aspect. The material to be discussed in this course begins with ethics, privacy, social networking, copyright, to the digital divide.
Course Code	TKIT165211
Course Name	Image Processing and Computer
Course Description	In this course, will be taught about the basics of image processing and computer vision. It is expected that students can apply the techniques learned in real-world cases.
Course Code	TKIT165212
Course Name	Systems Based Internet of Things
Course Description	This course discusses the principles of the Internet of Things and its applications. The material is divided into 3 major themes: (1) basic concept of IoT, (2) protocol and application of IoT, (3) and (4) project IoT. To provide hands-on experience, IoT applications can be assigned using the MQTT and OpenHAB protocols.
Course Code	TKIT165221
Course Name	Mobile Application Development
Course Description	This course taught about fundamental knowledge regarding to developing mobile applications.
Course Code	TKIT165222
Course Name	Software Testing
Course Description	This course is a step by step description of the software reliability process (a measure of the continuous delivery of correct service), which is obtained from software testing process. It includes introduction to the software reliability process, defining necessary reliability, developing operational profiles, preparing and executing test.
Course Code	TKIT165231

Course Name Analysis and Design of Information

CourseThe development of information systems can be ensured through a number ofDescriptionprocesses consisting of a set of activities, through stages, using methods and
applying best practices best practices, involving multiple stakeholders. One of the
important stages is the analysis and design of information systems. Therefore, this
course will focus on this stage.

Course Code TKIT165232

Course Name Enterprise-Based System

CourseThis course covers an overview of Enterprise Resource Planning (ERP) systemDescriptionsoftware and its role within the organization. An integrated system and its
importance in business are discussed in this course.