INTERIM REPORT

by

The Electrical Engineering Study Program (EESP)

Universitas Hasanuddin at Makassar

INDONESIA

In Conjunction to

ACCREDITATION CYCLE CRITERIA: 2021-2024

JUNE, 2021

FOREWORD

The Engineering Accreditation Commission (EAC) of ABET has evaluated the Electrical Engineering (B.Eng) programs at Hasanuddin University for the initial accreditation in 2019. The EESP has received ABET statements regarding three weaknesses. In this report, we have tried hard to response the statements by giving explanations, comments and evidences. The EESP would like to thank for the efforts made by ABET to evaluate the program.

Once again, we gratefully acknowledge in advance for the ABET effort to evaluate this responses. We are looking forward to hear further suggestions and positive response that our program could be accredited according to ABET criteria.

Best regards,

Task Force of the EESP's for ABET Accreditation

CONTINUOUS IMPROVEMENT

The EESP Response to ABET Statement #1:

1. Criterion 4. Continuous Improvement

This criterion requires that the program must regularly use appropriate, documented processes for assessing and evaluating the extent to which the student outcomes are being attained. The results of these evaluations must be systematically utilized as input for the continuous improvement of the program. In fall 2018, the institution implemented a university- wide outcome-based assessment process. The program presented an assessment plan in which the seven student outcomes were mapped to courses in the curriculum, but the course instructional materials and student work did not always support the student outcomes identified to be assessed in the course. In addition, documentation of the materials and student work used to assess the level to which student outcomes were attained was incomplete. The assessment results were submitted to the university quality assurance office, but the use of the results as input to the continuous improvement of the program was not documented. Thus, the strength of compliance with this criterion is lacking.

30-Day Due-Process Response

The EAC acknowledges receipt of documentation detailing recent actions taken to address this shortcoming. The program states that it provided documentation of the materials and student work used to assess the level to which student outcomes were attained during the site visit. However, at the time of the visit, the team did not find those documents satisfactory, especially since very few of them were in English, and the faculty explanations were inadequate. Neither additional material nor explanation was provided in the 30-day response to demonstrate use of appropriate processes for assessing and evaluating student outcome attainment. A translated copy of the fall 2019 program faculty meeting report indicates that the faculty identified improvement steps to be taken in several courses but documentation has not been provided to indicate what and how the improvement steps have been implemented. There is no clear indication as to how outcomes assessment has improved, nor are there any data or indication of how the changes have led to systematic improvement of the program. Although some actions have been initiated, the review process and all assessment tools have not yet been fully developed and implemented. Thus, the strength of compliance with this criterion is lacking.

Status

The program weakness is unresolved. In preparation for the next review, the EAC anticipates receiving evidence in the form of documentation that has been translated into English, indicating that an appropriate assessment process has been fully developed and implemented.

The EESP Response:

In this report, we have given the evidences in the forms of documents, assessment results, photos and other proof, which indicates the assessment process that have developed and implemented in our bachelor study program. In order to ease the trace of the evidences, we have provided a list of scheduled continuous improvement activities for the EAC of ABET. The following table present the continuous improvement activities, where the descriptions of the process as well as the evidences are presented below.

Date	**Involved Persons**	**Activity**	**Evidence Docs**
June 26, 2019	Faculty members including the Head of Department	Meeting to evaluate the Student outcomes (performance indication values)	Invitation Letter, meeting minutes (attached)
Januari 2, 2020	Basic Electronics Lecturer Team	Meeting to evaluate the Student outcomes (performance indication values)	Meeting minutres (attached)
January 8, 2020	Faculty members including the Head of Department	Meeting to evaluate the Student outcomes (performance indication values)	Invitation Letter, meeting minutes (attached)

June 24, 2020	Faculty members including the Head of Department	Meeting to evaluate the Student outcomes (performance indication values)	Invitation Letter, meeting minutes
November 14, 2020	Faculty members. Advisory Boards Team including the Head of Department	A meeting to ask for suggestions and input for the results of the evaluation of Student outcomes, and the profile of graduates (PEO) most needed for the industry	Invitation Letter, meeting minutes (attached)
January 24, 2021	Faculty members including the Head of Department	Meeting to evaluate the Student outcomes (performance indication values)	Invitation Letter, meeting minutes (attached)

Each four to five year EESP make a meeting with stake–holder to evaluate the Program Education Objective (PEO) and Student Outcomes (SO) of the EESP. The evidence of this process in presented in the following attachment.

The EESP organizes a meeting at the end of each semester to evaluate the performance indication (PI) values of each student outcome (SO). Then it evaluates the results by identifying some courses that contributes to some PIs that have lower values then the expected values. EESP assesses the student outcomes indicated by the performance indication values which are accumulated from some selected courses every semester.

After receiving the evaluation results from the EESP department, the team teaching will organize a meeting to identify the problems and recommending some actions to improve the performance indication values of its corresponding courses. The evidences of this process are presented below.

CONTINUOUS IMPROVEMENT PROCESS IMPLEMENTED BY EESP

A. Review of Program Educational Objects (PEO) and Student Outcomes (SO)

EESP UH has reformulated the PEO and SO statements since December 2020 and has set the second formula on January 22, 2021. The PEO formulation for EESP is described in three points of objectives as follows:

1) *Graduates have successful career as professionals in Electrical Engineering;*
2) *Graduates have the motivation and ability to continue and complete studies to a higher level of education or engage in career professional development activities;*
3) *Graduates have leadership and entrepreneurial spirit and a good ability to communicate and work together to dealing with the Asia Pacific/global markets and industries*.

The formulation of EESP SO itself does not have significant changes, revisions are made only at point 6 by adding the ability to apply and proficient in using the latest engineering tools. The formulation of EESP SO is described in seven point as follows:

SO 1) *Able to identify, formulate, and solve complex problems in the field of electrical engineering by applying the principles of engineering, science, and mathematics;*
SO 2) *Able to apply engineering design to produce solutions that meet specific needs by considering public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors;*
SO 3) *Able to communicate effectively with several audiences;*
SO 4) *Able to understand ethical and professional responsibilities in engineering and make fundamental judgments, taking into account the impact of engineering solutions in global, economic, environmental, and social context;*
SO 5) *Able to play an effective role in a team that together with its members encourage the creation of leadership character, form a collaboration and inclusive environment, establish goals, plan tasks, and achieve goals;*
SO 6) *Able to apply methods, ability to conduct experiments using the latest engineering tools, analyze/interpret data, and use technical assessment to draw conclusions;*
SO 7) *Able to acquire and apply the latest knowledge as needed by using appropriate learning strategies.*

The revies of PEO and SO is carried out based on the results of the evaluation by the IABEE evaluation as follows:

"However, there are items in the PPM formulation that are not appropriate to describe the profile of graduates in 3 to 5 years after graduation. The PPM formulation that has been made is more precisely categorized as the Student Outcome (SO) formulation of the study program. The review process for the PPM EESP is still not finished so the study program does not perfectly meet these criteria".

The stages of the review process for PEO and SO of EESP are as follows:

1. *Reviewing the results of the tracer study and stakeholder survey*
   The results of the tracer study show that around 52% of graduates are working in the field of Engineering or Industry and about 14% who pursue education

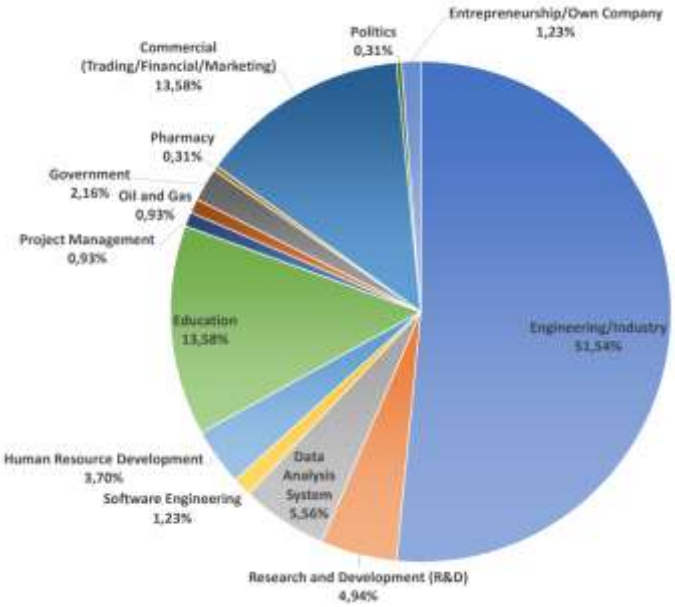

Figure A. Results of the Tracer Study in the field of work for EESP

The results of the alumni performance surveu to stakeholders are (scale 0-4):

- *technical contribution rate* : 3.23
- *communication skill level* : 3.14
- *level of ability to work together* : 3.32
- *level of ethics and social responsibility* : 3.32
- *level of contribution and active role* : 3.41
- *level of ability to learn new fields* : 3.23
- *level of achievement in participating in self-development programs* : 3.09

2. *Benchmarking of similar study programs at home and abroad PEO and SO benchmarking for similar study programs in the country is carried out with Institut Teknologi Bandung (ITB) and Universitas Gadjah Mada (UGM). Meanwhile, benchmarking of PEO and SO abroad was carried out with Massachusetts Institute of Technology (MIT).*

3. *Focus Group Discussion* meeting with *Advisory Board* is conducted on Saturday November 14, 2020, resulting ini some recommendation to reformulate the PEO of the EESP.

Table A. Advisory Board Team of the Department of Electrical Engineering, Faculty of Engineering, Hasanuddin University.

Name	*Position*
Ir. Abdul Salam, MM.	*Planning Manager PT. PLN (Persero) UIP Sulbagsel*
Irwan Thamrin Tantu	*President Director of TQ Tantu Tech, DBA*
Ir. Bambang Yusuf	General Manager PT. PLN (Persero) UIW
Otis Kafiar	General Foreman Field Project Engineer Electrical PT. Freeport Indonesia
Haris, ST., MT.	*Director of PT. Aneka Energi Baru dan Terbarukan*
Ir. Muammar Muhayyang, ST., MM.	*Chairman of the Indonesian Employers' Association*
Ir. Samuel Parura, MM	Senior Manager Resident Engineering PT. Pertamina
Dr. Ir. Jaizuludin Mahmud, MT.	*Principal Engineer of Center for the Study of Energy and Process Industries & Agency for the Assessment and Application of Technology*
A. Rahman	Marketing Manager PT. LEN Industri
Iwan Soma BSB	Electronic Coordinator PT. Bumi Sarana Beton
Dr. Ir. Syarifuddin Nojeng	*Vice Dean of Academic Fields Engineering Faculty*
Ir. Makkasau	*Electricity Practitioner*
Ir. Nuryadin Salam, MM	General Manager Telkom WITEL Makassar
Ir. Maragusti Harahap	*Head of IATEL (Electrical Engineering Alumni Association)*

By using a mapping table of the relationship between IK and SO for the course, it can be seen the SO value obtained in each MK. Furthermore, to determine the SO, each IK is given a different weight according to the depth level of the IK's contribution to SO according to Bloom's Taxonomy. The following points indicate the level of performance indication of the taxonomy:

- K : *ability to know the topic, knowledge, or skill under consideration (weight: 0.1)*
- C : *ability to understand the topic, knowledge, or skill under consideration (weight: 0.2)*
- A : *ability to analyze the topic or problem under consideration (weight: 0.3)*
- D : *ability to design engineering solutions to solve problems (weight: 0.4)*
- I : *ability to design implements or apply engineering solutions to solve problems (weight: 0.5)*

Student Outcome	Performance Indicators (PI) for This Outcome	
SO 1	1K	Ability to define and recognize learned electrical engineering subjects

	1C	Ability to understand and grasp the meaning of the electrical engineering knowledge and problems
	1A	Ability to analyze electrical engineering systems and problems
	1D	Ability to design components and systems to solve electrical engineering problems
SO 2	2A	Ability to analyze possible solutions to engineering problems
	2D	Ability to design solution to solve engineering problems
	2I	Ability to apply or implement engineering skills to actual conditions
SO 3	3A	Ability to analyze effective speech structure to communicate idea
	3D	Ability to arrange speech concept and structure
	3I	Ability to present idea in real situation (in front of audience)
SO 4	4K	Ability to know and recognize professional code of ethics
	4C	Ability to comprehend professional code of ethics
	4I	Ability to apply engineering ethics in real engineering design problems
SO 5	5C	Ability to comprehend leadership skills in a project-based education
	5D	Ability to design project plan in a simulated engineering project
	5I	Ability to lead a team in real engineering projects
SO 6	6A	Ability to analyze practically and interpret data to draw conclusions
	6D	Ability to design practical module and conduct experiment independently
	6I	Ability to apply or implement engineering knowledge in laboratory scales
SO 7	7C	Ability to identify new issues in electrical engineering fields of study
	7A	Ability to analyze possible alternative solutions to solve a trending problem
	7I	Ability to give novel scientific contribution to solve recent problem/issues in electrical engineering field of study

Tabel B. Assessment result for the student outcome (SO) for the Second Semester 2018, the First Semester 2019, the Second Semester 2019, and the First Semester 2020. The values indicate the performance indication for each SO.

No	Semester	% attained in each Performance Indicator of Student Outcome per class																				
		SO 1				SO 2			SO 3			SO 4			SO 5			SO 6			SO 7		
		1K	1C	1A	1D	2A	2D	2I	3A	3D	3I	4K	4C	4I	5C	5D	5I	6A	6D	6I	7C	7A	7I
1	Second Sem. 2018	3.40	3.03	2.97	2.64	3.03	2.83	2.28	3.59	2.97	NA	NA	3.64	3.07	3.46	3.07	3.05	3.54	3.22	3.07	3.18	2.74	3.28
		2.89				2.59			2.96			3.29			3.14			3.21			3.10		
2	First Sem. 2019	3.16	3.15	2.86	3.11	2.56	1.89	2.28	NA	2.86	3.65	3.53	NA	3.23	3.64	NA	NA	3.47	3.12	3.64	3.45	3.35	NA
		3.05				2.22			3.29			3.41			3.08			3.45			2.93		
3	Second Sem. 2019	3.56	3.58	3.12	2.98	3.71	3.06	2.66	3.79	3.15	NA	NA	3.74	3.66	3.47	3.66	2.97	3.60	2.81	3.23	3.25	2.79	2.56
		3.20				2.99			3.06			3.66			3.28			3.18			2.77		
4	First Sem. 2020	3.30	3.43	3.05	3.41	3.27	2.60	4.00	NA	3.05	3.65	3.74	NA	3.39	3.79	NA	NA	3.35	3.45	3.60	3.25	3.23	NA
		3.29				3.43			3.33			3.71			3.59			3.50			2.90		

Tabel C. Continuous Improvement 2nd of 2018 dan 2019

SO	IP	COURSE	2nd 2018 (POINT)	PROBLEM DESCRIPTION	RECOMMENDATION	2nd 2019 (POINT)	PROBLEM DESCRIPTION	RECOMMENDATION
1	1A	Electric Circuit 2	2.60	Lack of examples of questions and solutions	Give tutorials in the form of practice questions Give to students several guides to apply it in problem solving Give to student's homework	2.99	NA	Needs to be improved
1,2	1D 2I	Digital Systems	2.04	Lack of examples of questions and solutions	Give tutorials in the form of practice questions Give to students several guides to apply it in problem solving Give to student's homework	2.84	NA	Needs to be improved
1,7	1A 7A	Linear Systems	2.10	Lack of examples of questions and solutions	Give tutorials in the form of practice questions Give to students several guides to apply it in problem solving Give to student's homework	2.98	NA	Needs to be improved
2	2D	Computer Programming	2.65	Lack of hand-on practice to understand course theory	Provide some additional assignments, to train students' abilities so that they will be able to do computer programming	3.17	NA	Needs to be improved

SO	IP	COURSE	2nd 2018 (POINT)	PROBLEM DESCRIPTION	RECOMMENDATION	2nd 2019 (POINT)	PROBLEM DESCRIPTION	RECOMMENDATION
1,2	1D 2I	Integrated Electronics	2.09	Students cannot understand well	Give to students several guides to apply it in problem solving Improve learning methods and learning materials	2.24	There are still a small number of students who are able to understand	Improve learning methods and organize the assignment well
1,2	1A 21	Microprocessor System and Interface	2.70	Students cannot understand well because learning material is not yet applicable	Improve the content of learning materials	2.90	NA	Needs to be improved
1,2	1A 2D	Basic Control Systems	2.33	Lack of examples of questions and solutions	Give to students several guides to apply it in problem solving Giving tutorials in the form of practice questions	2.59	Lecturers have not adjusted the teaching and learning process during the pandemic	Improving learning methods and mastering technology in online learning
1,6	1D 6I	Electric Installation + Laboratory	2.36	Lack of hand-on practice to understand course theory	Give to students several guides to apply it in problem solving Provide some additional assignments	3.25	NA	Needs to be improved
1,2	1D 2D	Cellular Communication	2.51	Lack of examples of questions and solutions	Give to students several guides to apply it in problem solving Giving tutorials in the form of practice questions	3.34	NA	Needs to be improved
1,7	1A 7A	Calculus 2				2.08	Lecturers have not adjusted the teaching	Improving learning methods and

SO	IP	COURSE	2nd 2018 (POINT)	PROBLEM DESCRIPTION	RECOMMENDATION	2nd 2019 (POINT)	PROBLEM DESCRIPTION	RECOMMENDATION
							and learning process during the pandemic	mastering technology in online learning
6,7	6D 7I	Digital Control Systems + Laboratory				2.56	Lecturers have not adjusted the teaching and learning process during the pandemic	Improving learning methods and mastering technology in online learning

Tabel D. Continuous Improvement Semester 1st of 2019 dan 2020

SO	IP	COURSE	1st 2019 (POINT)	PROBLEM DESCRIPTION	RECOMMENDATION	1st 2020 (POINT)	PROBLEM DESCRIPTION	RECOMMENDATION
1	1A	Electric Circuit 1	2.51	Lack of examples of questions and solutions	Give to students several guides to apply it in problem solving Giving tutorials in the form of practice questions	2.99	NA	Needs to be improved
1	1A	Calculus 1	2.37	Lack of examples of questions and solutions	Give to students several guides to apply it in problem solving Giving tutorials in the form of practice questions	2.86	NA	Needs to be improved
1	1D	Logic Circuits	2.59	Students cannot understand well	Give to students several guides to apply it in problem solving Improve learning methods and organize assignment well	2.94	NA	Needs to be improved
1,7	1A 7A	Engineering Mathematics 1	2.36	Lack of examples of questions and solutions	Giving tutorials in the form of practice questions	2.79	NA	Needs to be improved
1	1A	Basic Electronics	1.93	Students cannot understand well	Give to students several guides to apply it in problem solving Improve learning methods	3.42	NA	Needs to be improved

					Improve learning methods and organize assignment well			
2	2A 2D	Probability and Statistics	1.89	Lack of examples of questions and solutions	Giving tutorials in the form of practice questions	2.60	Lecturers have not adjusted the teaching and learning process during the pandemic	Improving learning methods and mastering technology in online learning
1,2,6	1D 2I 6D	Antenna and Propagation + Laboratory	2.50	Students cannot understand well	Improve learning methods and learning materials	4.00	NA	Needs to be improved
1	1A	Power Electric System Analysis	1.73	Students cannot understand well	Improve learning methods and learning materials	0.64	Students cannot understand well	Improve learning methods
1,2	1D 2A	Electric Measurement	2.40	Students cannot understand well	Improve learning methods and organize assignment well	3.40	NA	Needs to be improved
1	1A	AC Transmission Systems				2.55	Lecturers have not adjusted the teaching and learning process during the pandemic	Improving learning methods and mastering technology in online learning
1,6,7	1D 6D 7C	Otomation Industry + Laboratory				2.65	Lecturers have not adjusted the teaching and learning process during the pandemic	Improving learning methods and mastering technology in online learning

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Nomor : 18894/UN4.7.7/KR.00.01/2020 Makassar, 30 November 2020
Lampiran : -
Hal : Undangan Rapat

Yth. : Bapak/Ibu Tim Perumus PPM dan CP PS-S1-TE
Di –
Makassar

Dengan hormat, kami mengundang Bapak/Ibu Dosen Tim Perumus PPM dan CP PS-S1-TE untuk menghadiri rapat secara daring, yang Insya Allah akan dilaksanakan pada:

Hari, Tanggal : Rabu, 2 Desember 2020
Waktu : Pukul 09.00 Wita s.d. selesai
Agenda : Perumusan PPM dan CP PS-S1-TE

Atas perhatian dan partisipasinya disampaikan terima kasih.

Mengetahui,
Ketua Departemen Teknik Elektro

Dr.Eng. Ir. Dewiani, M.T.
NIP. 19691026 199412 2 001

Ketua Tim
Perumus PPM dan CP

Dr. A. Ejah Umraeni Salam, S.T., M.T.
NIP. 19720908 199702 2 001

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DAFTAR HADIR

Hari, Tanggal	Rabu, 2 Desember 2020
Waktu	Pukul 09.00 — 12.00 WITA
Tempat	Aplikasi Zoom (Daring)
Agenda	Perumusan PPM dan CP

MO	NAMA	JABATAN	TANDA TANGAN
1	Dr.Eng. Ir. Dewiani, M.T.	Penanggung Jawab	
2	Dr. A. Ejah Umraeni Salam, S.T., M.T.	Ketua	
3	Andini Dani Achmad, S.T., M.T.	Sekretaris	
4	Prof. Dr.-Ing. Faizal Arya Samman, S.T., M.T.	Anggota	
5	Dr. Ir. Rhiza S. Sadjad, M.S.E.E.	Anggota	
6	Dr. Ir. Sri Mawar Said, M.T.	Anggota	
7	Ir. Zaenab, M.T.	Anggota	
8	Dr.Eng. Intan Sari Areni, S.T., M.T.	Anggota	

Mengetahui,
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NOTULENSI RAPAT TIM PERUMUS PPM DAN CP

PROGRAM STUDI S1 TEKNIK ELEKTRO

Hari, Tanggal	:	Rabu, 2 Desember 2020
Waktu	:	09.00 – 12.00 WITA
Tempat	:	Aplikasi Zoom (Daring)
Agenda	:	Perumusan PPM dan CP
Jumlah Peserta Hadir	:	8 orang

1. Terkait hasil evaluasi PPM PS-S1-TE oleh evaluator IABEE sbb:
   "*Namun, terdapat butir rumusan PPM yang tidak tepat untuk menggambarkan profil lulusan dalam 3 sampai dengan 5 tahun setelah lulus. Rumusan PPM yang telah dibuat lebih tepat dikategorikan sebagai rumusan Capaian Pembelajaran (CP) prodi. Proses peninjauan kembali terhadap rumusan PPM Prodi masih belum selesai sehingga prodi tidak secara sempurna memenuhi kriteria ini*"
   maka perlu dilakukan revisi rumusan PPM yang ada. Revisi rumusan PPM ini juga terkait dengan penyusunan kurikulum 2020 program studi yang akan diberlakukan pada awal tahun ajaran 2021.
2. Dilakukan *benchmarking* rumusan PPM dan CP melalui website resmi program studi universitas yang ada di dalam dan di luar Indonesia, yaitu:
   a. Beberapa Program Studi di STEI-ITB
   b. S1 Teknik Elektro UGM
   c. Program Studi Teknik Elektro Universitas Syiah Kuala
   d. Program Studi Teknik Elektro Universitas Indonesia
   e. Electrical Engineering Stony Brook University
   f. Industrial Engineering Technology BS The University of Southern Mississippi
3. Setelah dilakukan *benchmarking* tim merumuskan PPM PS-S1-TE dengan memperhatikan Visi Misi Universitas, Fakultas, dan Program Studi serta mempertimbangkan potensi sumberdaya, budaya, kebutuhan maupun kepentingan Negara sebagai berikut:
   1) Lulusan akan memiliki karir yang sukses sebagai profesional di bidang teknik elektro
   2) Lulusan akan memiliki motivasi dan kemampuan untuk melanjutkan dan menyelesaikan studi ke tingkat pendidikan yang lebih tinggi atau terlibat dalam kegiatan pengembangan profesional karirnya
   3) Lulusan akan memiliki jiwa kepemimpinan dan entrepreneurship, kemampuan yang baik dalam berkomunikasi dan bekerja sama dalam menghadapi pasar dan industri Asia Pasific/global

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4. PPM PS-S1-TE tersebut telah mencakup seluruh CP PS-S1-TE yang ada dan diperlihatkan pada tabel relasi berikut.

Draft Profil Profesional Mandiri (PPM)	Capaian Pembelajaran Lulusan						
	CP 1	CP 2	CP 3	CP 4	CP 5	CP 6	CP 7
PPM-1	✓	✓				✓	
PPM-2							✓
PPM-3			✓	✓	✓		

5. Terkait hasil evaluasi CP PS-S1-TE oleh evaluator IABEE sbb:
   "*Kriteria CP IABEE butir (e), yaitu tentang kemampuan menerapkan metode, kecakapan, dan peranti kerekayasaan mutakhir yang diperlukan untuk praktik kerekayasaan, belum sepenuhnya tercakup dalam rumusan CP Prodi butir 6, yaitu tentang kemampuan merancang/mengembangkan dan melakukan eksperimen yang tepat, menganalisis dan menterjemahkan data serta menggunakan ilmu rekayasa untuk menarik kesimpulan*"
   maka perlu dilakukan revisi rumusan CP Prodi butir 6 yang ada. Revisi rumusan CP ini sangat perlu dilakukan terkait dengan penyusunan kurikulum 2020 program studi yang akan diberlakukan pada awal tahun ajaran 2021.
6. Setelah dilakukan *benchmarking* tim melakukan revisi rumusan CP PS-S1-TE butir 6 dengan memperhatikan catatan evaluator IABEE sebagai berikut:
   "*Kemampuan untuk **mengembangkan metode dan kecakapan** melakukan eksperimen, menganalisis dan menginterpretasikan data, dan menggunakan penilaian teknik untuk menarik kesimpulan **dengan menggunakan piranti kerekayasaan mutakhir***"
7. Selanjutnya draft rumusan PPM dan CP butir 6 PS-S1-TE ini akan didiskusikan pada Rapat Dosen pada hari Jumat, 4 Desember 2020 untuk mendapatkan saran dan masukan demi penyempurnaannya.

Ketua Tim

Dr. A. Ejah Umraeni Salam, M.T.
NIP. 197209081997022001

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MEETING MINUTES
TEAM FORMULATION OF
PROGRAM EDUCATIONAL OBJECTIVE (PEO) AND STUDENT OUTCOMES (SO)

Day, Date	:	Wednesday, 2 Desember 2020
Time	:	09.00 – 12.00 WITA
Place	:	EESP Meeting Room
Agenda	:	Formulation of PEO and SO
Number of Attendees	:	8 people

1. Regarding the results of the PEO EESP evaluation by IABEE evaluators as follows:
   "*However, there are items in the PEO formulation that are not appropriate to describe the profile of graduates in 3 to 5 years after graduation. The PEO formulation that has been made is more precisely categorized as the Study Outcome (CP) formulation of study programs. The process of reviewing the PEO Prodi formulation is still not finished so the study program does not perfectly meet these criteria*" it is necessary to revise the existing PEO formulation. This revision of the PEO formulation is also related to the preparation of the 2020 curriculum of study programs which will be implemented at the beginning of the 2021 academic year.
2. Benchmarking the PEO and SO formulations through the official website of university study programs inside and outside Indonesia, namely:
   a. Several study programs at STEI-ITB
   b. EESP of UGM
   c. EESP of Universitas Syiah Kuala
   d. EESP of Universitas Indonesia
   e. Electrical Engineering Stony Brook University
   f. Industrial Engineering Technology BS The University of Southern Mississippi
3. After benchmarking, the team formulated the PEO of EESP by taking into account the vision and mission of the university, faculties, and study programs and considering suggestions and input of Advisory Board as stake holder, the potential resources, culture, needs and interests of the state as follows:
   1) Graduates will have successful careers as professionals in electrical engineering
   2) Graduates will have the motivation and ability to continue and complete studies to a higher level of education or engage in career professional development activities
   3) Graduates will have leadership and entrepreneurship spirit, good ability to communicate and work together in dealing with Asia Pacific/global markets and industries

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4. The EESP PEO has covered all existing SO and is shown in the following relation table.

PEO Draft	Student Outcome						
	SO 1	SO 2	SO 3	SO 4	SO 5	SO 6	SO 7
PEO-1	✓	✓				✓	
PEO-2							✓
PEO-3			✓	✓	✓		

5. Regarding the results of the evaluation of the EESP by the IABEE evaluators as follows:
   "*The IABEE SO criteria point e, which is about the application of the latest engineering methods, experiments, and tools needed for engineering practice, has not been fully covered in the EESP SO formulation point 6, which is about the ability to design/develop and conduct appropriate experiments, analyze and translating data and using engineering science to draw conclusions*"
   it is necessary to revise the formulation of the existing EESP SO point 6. This revision of the SO formulation really needs to be done related to the preparation of the 2020 curriculum of EESP which will be implemented at the beginning of the 2021 academic year.
6. After benchmarking, team revised the formulation of EESP SO point 6 by taking into account the IABEE evaluator notes as follows:
   "*Ability to develop methods and skills to conduct experiments, analyze and interpret data, and use engineering judgment to draw conclusions using the latest engineering tools*"
7. Furthermore, the draft of the EESP PEO and SO formulation will be discussed at the Lecturer Meeting on Friday, December 4, 2020 to get some suggestions and input for its improvement.

Chairman of the team

Signed

Dr. A. Ejah Umraeni Salam, M.T.
NIP. 197209081997022001

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Nomor : 18535/UN4.7.7/KR.00.01/2020 Makassar, 3 Desember 2020
Lampiran : -
Hal : Undangan rapat

Yth. : Bapak/Ibu Dosen Departemen Teknik Elektro
Di -
M a k a s s a r

Dengan hormat, kami mengundang Bapak/Ibu dosen Program Studi S1 Teknik Elektro untuk menghadiri rapat secara luring-daring, yang Insya Allah akan dilaksanakan pada:

Hari / Tanggal	:	Jumat, 4 Desember 2020
W a k t u	:	Pukul 09.00 Wita s.d selesai
T e m p a t	:	Luring : R. ABET Departemen Teknik Elektro Daring : Aplikasi Zoom
A g e n d a	:	- Perumusan PPM dan CP - Capstone Design - dll yang dianggap perlu

Mengingat pentingnya acara ini partisipasi Bapak/Ibu dalam mengikuti rapat ini sangat diharapkan tepat pada waktunya, atas perhatian dan partisipasinya disampaikan terima kasih.

Mengetahui,
Ketua Departemen Teknik Elektro

Dr.Eng. Ir. Dewiani, M.T
NIP. 19691026 199412 2 001

Ketua Tim IABEE,

Dr. A. Ejah Umraeni Salam, ST.,MT
NIP. 19720908 199702 2 001

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NOTULENSI RAPAT DOSEN PROGRAM STUDI S1 TEKNIK ELEKTRO

Hari, Tanggal	:	Jumat, 4 Desember 2020
Waktu	:	09.00 – 11.45 WITA
Tempat	:	Ruang ABET DTE (Luring) Aplikasi Zoom (Daring)
Agenda	:	• Perumusan PPM dan CP • Capstone Design
Jumlah Peserta Hadir	:	14 orang

1. Terkait hasil evaluasi PPM PS-S1-TE oleh evaluator IABEE sbb:
   "*Namun, terdapat butir rumusan PPM yang tidak tepat untuk menggambarkan profil lulusan dalam 3 sampai dengan 5 tahun setelah lulus. Rumusan PPM yang telah dibuat lebih tepat dikategorikan sebagai rumusan Capaian Pembelajaran (CP) prodi. Proses peninjauan kembali terhadap rumusan PPM Prodi masih belum selesai sehingga prodi tidak secara sempurna memenuhi kriteria ini*"
   maka perlu dilakukan revisi rumusan PPM yang ada. Revisi rumusan PPM ini juga terkait dengan penyusunan kurikulum 2020 program studi yang akan diberlakukan pada awal tahun ajaran 2021.
2. Draft awal rumusan PPM PS-S1-TE yang telah dirumuskan oleh tim perumus PPM-CP PS-S1-TE dan kemudian dibahas untuk mendapatkan saran dan masukan adalah:
   1) Lulusan akan memiliki karir yang sukses sebagai profesional di bidang teknik elektro
   2) Lulusan akan memiliki motivasi dan kemampuan untuk melanjutkan dan menyelesaikan studi ke tingkat pendidikan yang lebih tinggi atau terlibat dalam kegiatan pengembangan profesional karirnya
   3) Lulusan akan memiliki jiwa kepemimpinan dan entrepreneurship, kemampuan yang baik dalam berkomunikasi dan bekerja sama dalam menghadapi pasar dan industri Asia Pasific/global
3. Peninjauan draft awal rumusan PPM menghasilkan tidak adanya perubahan selain dihilangkannya kata "akan" pada setiap poin rumusan sehingga diperoleh rumusan PPM PS-S1-TE sebagai berikut:
   1) Lulusan memiliki karir yang sukses sebagai profesional di bidang Teknik Elektro;
   2) Lulusan memiliki motivasi dan kemampuan untuk melanjutkan dan menyelesaikan studi ke tingkat pendidikan yang lebih tinggi atau terlibat dalam kegiatan pengembangan profesional karirnya;
   3) Lulusan memiliki jiwa kepemimpinan dan entrepreneurship, kemampuan yang baik dalam berkomunikasi dan bekerja sama dalam menghadapi pasar dan industri Asia Pasific/global.
4. Terkait hasil evaluasi CP PS-S1-TE oleh evaluator IABEE sbb:
   "*Kriteria CP IABEE butir (e), yaitu tentang kemampuan menerapkan metode, kecakapan, dan peranti kerekayasaan mutakhir yang diperlukan untuk praktik kerekayasaan, belum sepenuhnya tercakup dalam rumusan CP Prodi butir 6, yaitu tentang kemampuan merancang/mengembangkan dan melakukan eksperimen yang tepat, menganalisis dan menterjemahkan data serta menggunakan ilmu rekayasa untuk menarik kesimpulan*"

maka perlu dilakukan revisi rumusan CP Prodi butir 6 yang ada. Revisi rumusan CP ini sangat perlu dilakukan terkait dengan penyusunan kurikulum 2020 program studi yang akan diberlakukan pada awal tahun ajaran 2021.

5. Draft awal rumusan CP butir 6 yang telah dirumuskan oleh tim perumus PPM-CP PS-S1-TE dan kemudian dibahas untuk mendapatkan saran dan masukan adalah:
   "*Kemampuan untuk mengembangkan metode dan kecakapan melakukan eksperimen, menganalisis dan menginterpretasikan data, dan menggunakan penilaian teknik untuk menarik kesimpulan dengan menggunakan piranti kerekayasaan mutakhir*"
6. Peninjauan draft CP butir 6 PS-S1-TE menghasilkan draft rumusan sebagai berikut:
   "*Kemampuan untuk menerapkan metode, kecakapan melakukan eksperimen dengan menggunakan piranti kerekayasaan mutakhir, menganalisis/menginterpretasikan data, dan menggunakan penilaian teknik untuk menarik kesimpulan*"
   Kata "mengembangkan" sebelum kata "metode" pada rumusan awal diganti dengan kata "menerapkan" dengan pertimbangan lulusan S1 PS-S1-TE hanya sampai pada kemampuan menerapkan metode.
   Frase "dengan menggunakan piranti kerekayasaan mutakhir" yang pada rumusan awal terletak di akhir kalimat dipindahkan posisinya di tengah kalimat sebagai penjelas kecakapan lulusan dalam melakukan eksperimen.
7. Draft rumusan PPM dan CP PS-S1-TE yang telah disepakati selanjutnya akan disosialisasikan kepada pada Advisory Board untuk mendapatkan saran/masukan untuk penyempurnaannya.
8. Jadwal pertemuan dengan Advisory Board untuk membahas draft rumusan PPM dan CP PS-S1-TE akan ditentukan selanjutnya.
9. SOP *Capstone Design* untuk tingkat program studi akan disusun oleh Dr. Rhiza, Prof. Faizal, dan Samuel M.T.

Ketua Departemen Teknik Elektro

Dr.Eng. Ir. Dewiani, M.T
NIP. 19691026 199412 2 001

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MEETING MINUTES
WITH FACULTY MEMBERS OF EESP

Day, Date	:	Friday, 4 December 2020
Time	:	09.00 – 11.45 WITA
Place	:	EESP Meeting Room (offline) Zoom Application (online)
Agenda	:	• PEO and SO Formulation • Capstone Design
Number of Attendees	:	14 people

1. Regarding the results of the PEO EESP evaluation by IABEE evaluators as follows:
   "*However, there are items in the PEO formulation that are not appropriate to describe the profile of graduates in 3 to 5 years after graduation. The PEO formulation that has been made is more precisely categorized as the Study Outcome (CP) formulation of study programs. The process of reviewing the PEO Prodi formulation is still not finished so the study program does not perfectly meet these criteria*" it is necessary to revise the existing PEO formulation. This revision of the PEO formulation is also related to the preparation of the 2020 curriculum of study programs which will be implemented at the beginning of the 2021 academic year.
2. The initial draft of EESP PEO formulation that has been formulated by EESP PEO and SO formulation team and the discussed to get suggestions and input is:
   1) Graduates will have successful careers as professionals in electrical engineering
   2) Graduates will have the motivation and ability to continue and complete studies to a higher level of education or engage in career professional development activities
   3) Graduates will have leadership and entrepreneurship spirit, good ability to communicate and work together in dealing with Asia Pacific/global markets and industries
3. The review of the initial draft of the PEO formulation resulted in no changes other than the removal of the word "will" at each formulation point so that the EESP PEO formulation was obtained as follows:
   1) Graduates have successful careers as professionals in Electrical Engineering;
   2) Graduates have the motivation and ability to continue and complete studies to a higher level of education or engage in career professional development activities;
   3) Graduates have leadership and entrepreneurship spirit, good ability to communicate and work together in dealing with Asia Pacific/Global markets and industries.
4. Regarding the results of the evaluation of the EESP by the IABEE evaluators as follows:
   "*The IABEE SO criteria point e, which is about the application of the latest engineering methods, experiments, and tools needed for engineering practice, has not been fully covered in the EESP SO formulation point 6, which is about the ability to design/develop and conduct appropriate experiments, analyze and translating data and using engineering science to draw conclusions*"
   it is necessary to revise the formulation of the existing EESP SO point 6. This revision of the SO formulation really needs to be done related to the preparation of the 2020 curriculum of EESP which will be implemented at the beginning of the 2021 academic year.

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5. The initial draft of the formulation of SO point 6 which has been formulated by the formulation team of PEO-SO and then discussed to get suggestions and inputs are:
   "*The ability to develop methods and skills to conduct experiments, analyze and interpret data, and use engineering judgment to draw conclusions using the latest engineering tools*"
6. The review of the EESP SO draft point 6 resulted in the following draft formulation:
   "*The ability to apply methods, the ability to conduct experiments using the latest engineering tools, analyze/interpret data, and use technical judgment to draw conclusions*"
   The word "develop" before the word "method" in the initial formulation is replaced with the word "apply" with the considered that EESP graduates only reach the ability to apply methods.
   The phrase "using the latest engineering tools" which in the initial formulation is located in the middle of the sentence as an explanation of the graduates' skills in conducting experiments.
7. The agreed draft of EESP PEO and SO formulations will then be disseminated to the Advisory Board to obtain suggestion/inputs for improvement
8. A meeting schedule with the Advisory Board to discuss the draft formulation of EESP PEO and SO will be determined later
9. Standard Operational Procedure of Capstone Design for EESP will be prepared by Dr.Rhiza, Prof. Faizal, and Samuel, M.T.

Head of EESP

signed

Dr.Eng. Ir. Dewiani, M.T
NIP. 19691026 199412 2 001

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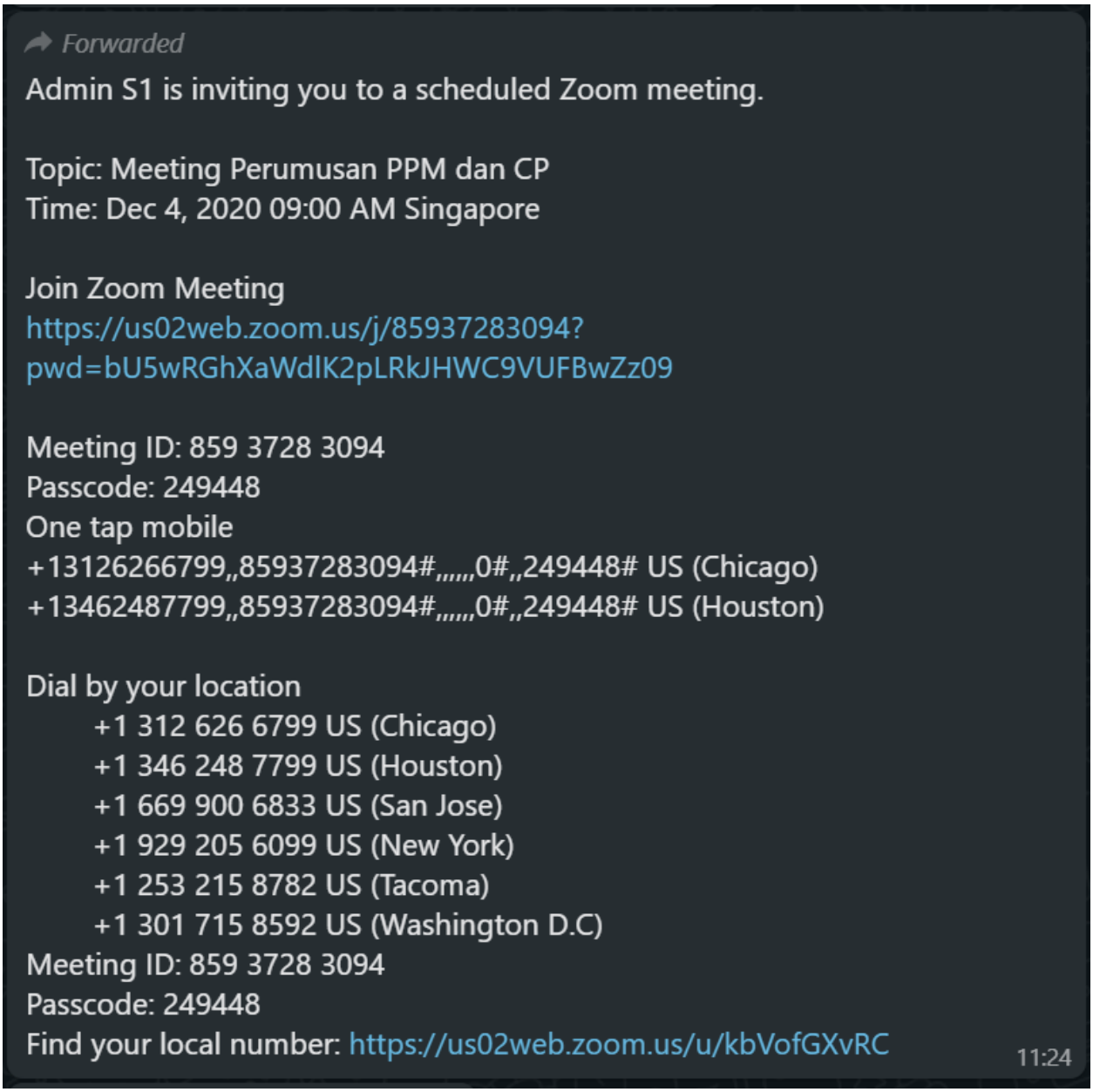
Link Zoom (Rapat via Daring)



Forwarded

Admin S1 is inviting you to a scheduled Zoom meeting.

Topic: Meeting Perumusan PPM dan CP
Time: Dec 4, 2020 09:00 AM Singapore

Join Zoom Meeting
https://us02web.zoom.us/j/85937283094?pwd=bU5wRGhXaWdlK2pLRkJHWC9VUFBwZz09

Meeting ID: 859 3728 3094
Passcode: 249448
One tap mobile
+13126266799,,85937283094#,,,,,,0#,,249448# US (Chicago)
+13462487799,,85937283094#,,,,,,0#,,249448# US (Houston)

Dial by your location
+1 312 626 6799 US (Chicago)
+1 346 248 7799 US (Houston)
+1 669 900 6833 US (San Jose)
+1 929 205 6099 US (New York)
+1 253 215 8782 US (Tacoma)
+1 301 715 8592 US (Washington D.C)
Meeting ID: 859 3728 3094
Passcode: 249448
Find your local number: https://us02web.zoom.us/u/kbVofGXvRC

11:24

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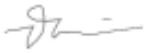
Attendance List:

Daftar Hadir Rapat IABEE - 4 Desember 2020

Form: Rapat IABEE Departemen Teknik Elektro

Nama Lengkap	NIP	Tanda Tangan
sri mawar said	196011061986012001	
Rhiza S. Sadjad	195709061982031004	
Azran Budi Arief, S.T., M.T	198902012019031007	
Dewiani	196910261994122001	
Ida Rachmaniar	198206302012122001	
Samuel Panggalo	196203041988111001	
Andini Dani Achmad	198806212015042003	
Ir. Zaenab Muslimin. M.T.	19660201 1992022002	
Prof. Dr. Ir. Syafruddin Syarif, MT	196111251988021001	
WARDI	197208281999031003	
Dr.Ir. Hasniaty A., S.T., M.T.	197412052000122001	
Ikhlas Kitta	197609142008011006	
Ir. Elyas Palantei, M.Eng., PhD	196902011994121001	

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Nama Lengkap	NIP	Tanda Tangan
Intan Sari Areni	187502032000122002	

KEPUTUSAN
DEKAN FAKULTAS TEKNIK UNIVERSITAS HASANUDDIN
Nomor : 1703/UN4.7/KEP/2020

TENTANG

ADVISORY BOARD DEPARTEMEN TEKNIK ELEKTRO
FAKULTAS TEKNIK UNIVERSITAS HASANUDDIN

DEKAN FAKULTAS TEKNIK UNIVERSITAS HASANUDDIN

Membaca : Surat Ketua Departemen Teknik Elektro Fakultas Teknik Universitas Hasanuddin nomor : 18475/UN4.7.7/KU.02.01/2020 tanggal 2 Desember 2020.

Menimbang :
a. bahwa untuk memberikan masukan, nasehat dan pertimbanagn terhadap arah kebijakan di Departemen Teknik Elektro Fakultas Teknik Universitas Hasanuddin, maka perlu ditetapkan Advisory Board;
b. bahwa mereka yang namanya tercantum dalam lampiran Surat Keputusan ini dipandang mampu dan memenuhi syarat untuk diangkat sebagai Advisory Board Departemen Teknik Elektro Fakultas Teknik Universitas Hasanuddin.
c. bahwa untuk kepentingan butir a dan b tersebut di atas perlu menerbitkan Surat Keputusannya.

Mengingat :
1. UU RI No. 20 Tahun 2003. Tentang Sistem Pendidikan Nasional
2. UU. RI No. 12 Tahun 2012 tentang Pendidikan Tinggi
3. PP. RI. No. 23 Tahun 1956 LN RI tahun 1956 No. 39, tentang pendirian Unhas
4. Kepmendikbud R.I. Nomor :75623/UU/1960 tgl. 7 September 1960, tentang Pembukaan Fakultas Teknik Unhas.
5. Peraturan Pemerintah R.I. Nomor 53 Tahun 2015, tanggal 22 Juli 2015 tentang Statuta Universitas Hasanuddin;
6. Peraturan Rektor Universitas Hasanuddin nomor 13/UN4.1/2018 tanggal 15 Oktober 2018 tentang Organisasi dan Tata Kerja Fakultas dan Sekolah Universitas Hasanuddin;
7. Surat Keputusan Rektor Unhas nomor : 1316/UN4.1/KEP/2018, tanggal 28 Maret 2018, tentang Pengangkatan Dekan Fakultas Teknik UNHAS.

MEMUTUSKAN :

Menetapkan : KEPUTUSAN DEKAN FAKULTAS TEKNIK UNIVERSITAS HASANUDDIN TENTANG PENGANGKATAN ADVISORY BOARD DEPARTEMEN TEKNIK ELEKTRO FAKULTAS TEKNIK UNIVERSITAS HASANUDDIN

PERTAMA : Mengangkat mereka yang namanya tercantum dalam lajur 2 daftar lampiran surat keputusan ini sebagai Advisory Board Departemen Teknik Elektro Fakultas Teknik Universitas Hasanuddin

KEDUA : Uraian tugas:
1. Memberikan masukan, nasehat dan pertimbangan terhadap arah kebijakan di Departemen Teknik Elektro, Fakultas Teknik, Universitas Hasanuddin

KETIGA : Segala biaya yang dikeluarkan sehubungan dengan keputusan ini dibebankan pada dana DPAU PTN Badan Hukum Unhas, alokasi dana Departemen Teknik Elektro Fakultas Teknik Universitas Hasanuddin tahun 2020.

KEEMPAT : Keputusan ini berlaku selama 4 (empat) tahun terhitung mulai tanggal ditetapkan, dengan ketentuan bahwa apabila dikemudian hari ternyata terdapat kekeliruan dalam keputusan ini, maka akan diadakan perbaikan sebagaimana mestinya.

Ditetapkan di Gowa
pada tanggal, 8 Desember 2020

Dekan,

Prof. Dr. Ir. Muhammad Arsyad Thaha, M.T.
NIP 19601231 198609 1 001

Tembusan:
1. Para Wakil Dekan FT-UH;
2. Yang bersangkutan.

Lampiran : Surat Keputusan Dekan Fakultas Teknik Universitas Hasanuddin
Nomor : 1703/UN4.7/KEP/2020
Tanggal : 8 Desember 2020
Tentang : Pengangkatan Tim Advisory Board Departemen Teknik Elektro Fakultas Teknik Universitas Hasanuddin.

No	Nama Tim	Jabatan	Keterangan
1	2	3	4
1.	Ir. Abdul Salam, MM	Manajer Perencanaan PT. PLN (Persero) UIP Sulbagsel	
2.	Irwan Thamrin Tantu	Presiden Direktur TQ Tantu Tech, DBA	
3.	Ir. Bambang Yusuf	GM PT. PLN (Persero) UIW	
4.	Otis Kafiar	General Foreman Field Project Engineer Electrical PT. Freeport Indonesia	
5.	Haris, ST., MT	Direktur Aneka Energi Baru dan Terbarukan	
6.	Ir. Muammar Muhayyang, ST., MM	Ketua Asosiasi Pengusaha Indonesia	
7	Ir. Samuel Parura, MM	Senior Manager Resident Engineering PT. Pertamina	
8	Dr.Ir. Jaizuludin Mahmud, MT	Perekayasa Utama Pusat Pengkajian Industri Proses dan Energi & Badan Pengkajian dan Penerapan Teknologi	
9	A. Rahman	Marketing Manager PT. LEN Industri	
10	Iwan Soma BSB	Electronic Coordinator PT. Bumi Sarana Beton	
11	Dr.Ir. Syarifuddin Nojeng	Wakil Dekan Bidang Akademik Fakultas Teknik UMI	
12	Ir. Makkasau	Praktisi Ketenaga Listrikan	
13	Ir. Nuryadin Salam, MM	GM Telkom Witel Makassar	
14	Ir. Maragusti Harahap	Ketua Ikatan Alumni Teknik Elektro	

k Dekan,

Prof. Dr. Ir. Muhammad Arsyad Thaha, M.T
NIP 19601231 198609 1 001

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http://eng.unhas.ac.id, Email: teknik@unhas.ac.id

Nomor : 16534/UN4.7.7/KR.00.00/2020
Hal : Undangan Rapat

Yth : **Otis Kafiar**
General Foreman Field Project Engineer Electrical PT. Freeport Indonesia
di-
Papua

Dengan Hormat

Dalam rangka meningkatkan sistem pembelajaran pada Departemen Teknik Elektro serta sehubungan dengan Akreditasi IABEE yang akan divisitas pada tanggal 25 November 2020, maka dibutuhkan beberapa orang advisory Board yang merupakan salah satu dari persyaratan Akreditasi IABEE. Oleh karena itu, kami dari Departemen Teknik Elektro mengundang dengan hormat untuk menghadiri meeting yang akan dilaksanakan secara online melalui **zoom** pada :

Hari/Tanggal : Sabtu, 14 November 2020
Jam : 10.00 - selesai
Agenda :
1. Pemaparan Profil Profesional Mandiri (PPM) dan Pencapaian Pembelajaran (CP) Program Studi Teknik Elektro
2. Diskusi dan Evaluasi Kurikulum
3. Dan Lain-lain dianggap Perlu

https://us02web.zoom.us/j/83525933157?pwd=VDE4S0xYZGIvc2U4UFJCVmN4bmk0dz09
Meeting ID: 835 2593 3157
Passcode: 422673

Besar harapan kami agar yang bersangkutan dapat berpartisipasi pada kegiatan tersebut.
Demikian undangan ini kami buat, atas perhatian dan kerjasamanya diucapkan terima kasih.

Gowa, 6 November 2020
Ketua Departemen Teknik Elektro
Fakultas Teknik Unhas

Dr.Eng.Ir. Dewiani, MT.
NIP. 19691026 199412 2 001

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Jl. Poros Malino KM. 6 Gowa , 92171, Sulawesi Selatan
Telepon (0411) 586015, 586262, Fax (0411) 586015
http://eng.unhas.ac.id, Email: teknik@unhas.ac.id

Nomor : 16534/UN4.7.7/KR.00.00/2020
Hal : Undangan Rapat

Yth : **A. Rahman**
Marketing Manager PT. LEN Industri
di-
Tempat

Dengan Hormat

Dalam rangka meningkatkan sistem pembelajaran pada Departemen Teknik Elektro serta sehubungan dengan Akreditasi IABEE yang akan divisitas pada tanggal 25 November 2020, maka dibutuhkan beberapa orang advisory Board yang merupakan salah satu dari persyaratan Akreditasi IABEE. Oleh karena itu, kami dari Departemen Teknik Elektro mengundang dengan hormat untuk menghadiri meeting yang akan dilaksanakan secara online melalui **zoom** pada :

Hari/Tanggal : Sabtu, 14 November 2020
Jam : 10.00 - selesai
Agenda :
1. Pemaparan Profil Profesional Mandiri (PPM) dan Pencapaian Pembelajaran (CP) Program Studi Teknik Elektro
2. Diskusi dan Evaluasi Kurikulum
3. Dan Lain-lain dianggap Perlu

https://us02web.zoom.us/j/83525933157?pwd=VDE4S0xYZGIvc2U4UFJCVmN4bmk0dz09
Meeting ID: 835 2593 3157
Passcode: 422673

Besar harapan kami agar yang bersangkutan dapat berpartisipasi pada kegiatan tersebut.
Demikian undangan ini kami buat, atas perhatian dan kerjasamanya diucapkan terima kasih.

Gowa, 6 November 2020
Ketua Departemen Teknik Elektro
Fakultas Teknik Unhas

Dr.Eng.Ir. Dewiani, MT.
NIP. 19691026 199412 2 001

KEMENTERIAN RISET, TEKNOLOGI, DAN PENDIDIKAN TINGGI
UNIVERSITAS HASANUDDIN
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Nomor : 16534/UN4.7.7/KR.00.00/2020
Hal : Undangan Rapat

Yth : **Irwan Thamrin Tantu**
Presiden Direktur TQ Tantu Tech, DBA
di-
Tempat

Dengan Hormat

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Gowa, 6 November 2020
Ketua Departemen Teknik Elektro
Fakultas Teknik Unhas

Dr.Eng.Ir. Dewiani, MT.
NIP. 19691026 199412 2 001

NOTULENSI
FOCUS GROUP DISCUSSION
PROGRAM STUDI S1 TEKNIK ELEKTRO DEPARTEMEN TEKNIK ELEKTRO

Hari, Tanggal : Sabtu, 14 November 2020
Pukul : 10.00 – 14.00 WITA

1. Ir.Abdul Salam: Mahasiswa diharapkan mampu diikutkan sebanyak mungkin dalam program magang di industri, karena sangat diperhitungkan pada perekrutan calon pekerja, karena yang menjadi prioritas diterima adalah yang pernah magang di industri tersebut.

2. Irwan Thamrin Tantu : Mahasiswa harus bersifat kreatif dan inovatif, dalam menghadapi era globalisasasi sehingga menghasilkan ide-ide baru yang inovatif, terutama dalam menghadapi Revolusi Industri 4.0.

3. Ir.Bambang Yusuf : Prodi harus banyak menjalin kerjasama dengan segala pihak, baik pihak stake holder, industri dalam dan luar negeri.

4. Otis Kafir : Untuk kegiatan Kerja Praktek di Perusahaan, selama melakukan Kerja Praktek harus ada jobdesk yang disepakati antara mahasiswa dan pihak perusahaan,.

5. Haris, ST.,MT : Mahasiswa perlu mempelajari dan mencari titik lemah dari teknologi yang dikuasainya untuk kemudian memberikan kesempurnaan melalui upaya kreatif dengan penemuan yang dilakukannya.

6. Ir. Muammar Muhayyang, ST., MM : Mahasiswa millenium dituntut memiliki jiwa enterpreneur, dengan membekali dengan materi kewirausahaan, sehingga nantinya lulusan yang diperoleh, tidak hanya menjadi pekerja tetapi dapat menciptakan lapangan kerja.

7. Ir. Samuel Parura, MM : Memanfaatkan teknologi yang sudah ada, menemukan kelemahannya dan memberikan solusi pada kelemahan yang ditemukan tersebut.

8. Dr. Ir. Jaizuludin Mahmud, M : Mahasiswa harus memiliki etika profesional, bersifat loyal, bermoral dan berintegritas.

9. A. Rahman : Mahasiswa harus mampu meningkatkan kualitas pengetahuan dan potensi pribadinya yang menjadi hal penting yang dilakukan sebagai tuntutan zaman.

10. Iwan Soma BSB : Upaya kolaborasi secara personal perlu dibangun dalam diri generasi milenial sebagai karakter kecakapan abad 21. Kolaborasi akan memunculkan potensi peluang yang lebih cepat dan lebih besar.
11. Dr. Ir. Syarifuddin Nojeng : Mahasiswa yang berjiwa peneliti harus diakomodir, untuk melanjutkan pendidikan ke jenjang yang lebih tinggi (S2), dengan memberikan informasi kemudahan mendapatkab peluang beasiswa.

12. **Ir. Makkasau :** Mahasiswa harus mampu bekerjasama dalam suatu kelompok, mampu memimpin dan menyusun rencana kerja yang baik, sehingga setiap pekerjaan dapat diselesaikan dengan lancar dan tepat waktu.

13. **Ir. Nuryadin Salam, MM :** Mahasiwa harus meningkatkan skill bakat kekinian yang dibutuhkan seperti penguasaan teknologi, kemampuan berbahasa yang baik dan benar, dan penguasaan bahasa asing.

14. **Ir. Maragusti Harahap :** Setiap alumni wajib menjadi anggota IATEL, sehingga informasi yang cepat dan valid tentang informasi lapangan kerja dapat diperoleh dengan mudah, terutama pada saat baru meraih gelar sarjana.

Gowa, 14 November 2020
Ketua Departemen Teknik Elektro
Fakultas Teknik Unhas

Dr. Eng. Ir. Dewiani, M.T.
NIP. 19691026 199412 2 001

MEETING MINUTES

FOCUS GROUP DISCUSSION MINUTES
PROGRAM STUDI S1 TEKNIK ELEKTRO DEPARTEMEN TEKNIK ELEKTRO

Day, Date : Saturday, 14 November 2020
Time : 10.00 – 14.00 WITA

The following is recommendation given by the advisory board members in the meeting.

1. **Ir.Abdul Salam:** Students are expected to be able to be included as much as possible in internship programs in the industry, because it is very taken into account in the recruitment of prospective workers, because the priority to be accepted is those who have internships in the industry

2. **Irwan Thamrin Tantu**: Students must be creative and innovative, in facing the era of globalization so as to produce new innovative ideas, especially in facing the Industrial Revolution 4.0

3. **Ir.Bambang Yusuf:** EESP must collaborate with all parties, both stake holders, domestic and foreign industries

4. **Otis Kafir:** For Job Training activities in the company during the Job Training there must be an agreed jobdesk between the student and the company

5. **Haris, ST.,MT:** Students need to study and find the weak points of the technology they master and then provide perfection through creative efforts with the inventions they make.

6. **Ir. Muammar Muhayyang, ST., MM:** Millennium students are required to have an entrepreneurial spirit, by equipping them with entrepreneurial materials, so that later graduates will not only become workers but can create jobs.

7. **Ir. Samuel Parura, MM** : Utilize existing technology, find its weaknesses and provide solutions to the weaknesses found.

8. **Dr. Ir. Jaizuludin Mahmud, M:** Students must have professional ethics, are loyal, have morality and integrity.

9. **A. Rahman:** Students must be able to improve the quality of their knowledge and personal potential which is an important thing to do as the demands of the times.

10. **Iwan Soma BSB:** Personal collaboration efforts need to be built within the millennial generation as a character of 21st century skills. Collaboration will create faster and bigger potential opportunities.

11. **Dr. Ir. Syarifuddin Nojeng:** Students with research spirit must be accommodated, to continue their education to a higher level (S2), by providing information on the ease of obtaining scholarship opportunities.

12. **Ir. Makkasau:** Students must be able to work together in a group, be able to lead and develop a good work plan, so that every job can be completed smoothly and on time.

13. **Ir. Nuryadin Salam, MM:** Students must improve the skills of contemporary talent needed such as mastery of technology, good and correct language skills, and mastery of foreign languages.

14. **Ir. Maragusti Harahap:** Every alumni is required to become a member of IATEL, so that fast and valid information about employment information can be obtained easily, especially when they are just getting a bachelor's degree.

Gowa, 14 November 2020
Head of EESP

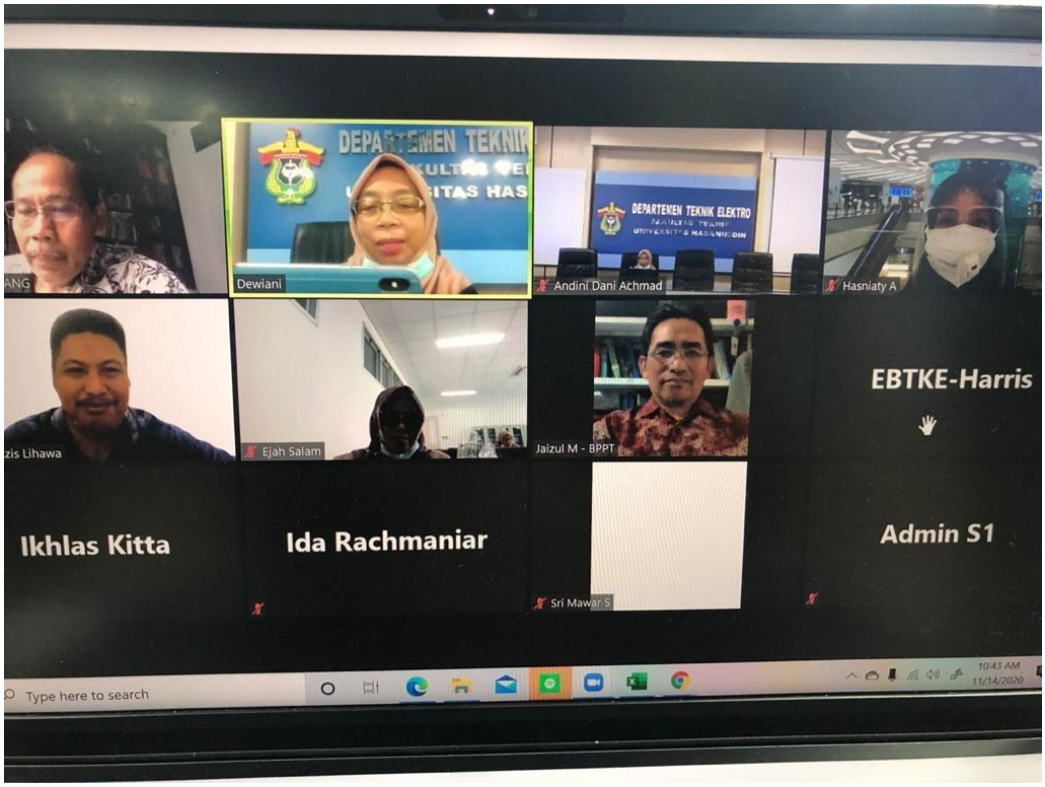
Signed

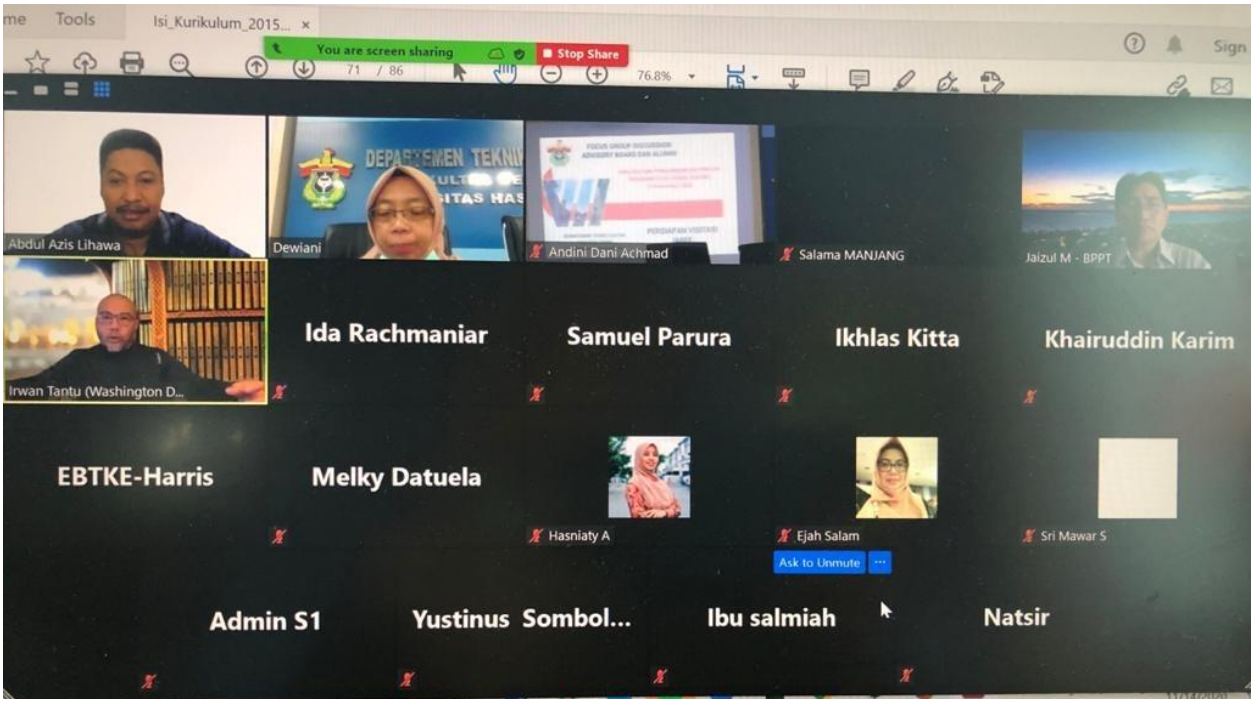
Dr. Eng. Ir. Dewiani, M.T.
NIP. 19691026 199412 2 001

FOCUS GROUP DISCUSSION with ADVISORY BOARD

ELECTRICAL ENGINEERING STUDY PROGRAM

14 NOVEMBER 2020




Tools
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Stop Share
71 / 86
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Abdul Azis Lihawa
Dewiani
Andini Dani Achmad
Salama MANJANG
Jaizul M - BPPT
Irwan Tantu (Washington D...
Ida Rachmaniar
Samuel Parura
Ikhlas Kitta
Khairuddin Karim
EBTKE-Harris
Melky Datuela
Hasniaty A
Ejah Salam
Ask to Unmute
Sri Mawar S
Admin S1
Yustinus Sombol...
Ibu salmiah
Natsir

KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN
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Website http:://eng.unhas.ac.id, E-mail: elektro@unhas.ac.id

Nomor : **098/UN4.7.7/HM.01.01/2020**
Lampiran : -
Hal : **Undangan Rapat**

Yth. : Bapak/Ibu Dosen DepartemenTeknik Elektro
Di -
M a k a s s a r

Sehubungan dengan akan dimulainya perkuliahan semester akhir 2019/2020 maka kami mengundang Bapak/Ibu Dosen untuk menghadiri rapat, yang Insya Allah akan dilaksanakan pada:

Hari / Tanggal	:	Rabu, 8 Januari 2020
W a k t u	:	Pukul 10.00 Wita s.d selesai
T e m p a t	:	Ruang Rapat Departemen Teknik Elektro
A g e n d a	:	- Evaluasi Pembelajaran Semester Awal 2019/2020
		- Persiapan Pembelajaran Semester Akhir 2019/2020
		- dll yang dianggap perlu

Mengingat pentingnya kegiatan ini partisipasi Bapak/Ibu dalam mengikuti rapat ini sangat diharapkan tepat pada waktunya, atas perhatian dan partisipasinya disampaikan terima kasih.

Gowa, 6 Januari 2020
Ketua Departemen Teknik Elektro,

Prof. Dr. Ir. Salama Manjang, M.T.
NIP. 19621231 199003 1 024

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NOTULENSI RAPAT

Hari/Tanggal : Rabu, 8 Januari 2020
Waktu : 10.00 – selesai (WITA)
Tempat : Ruang Rapat Departemen Teknik Elektro
Agenda : 1. Evaluasi pembelajaran semester awal 2019/2020
2. Persiapan pembelajaran semester akhir 2019/2020

Evaluasi Pembelajaran Semester Awal 2019/2020

Indeks Capaian Pembelajaran Lulusan

CP 1	CP 2	CP 3	CP 4	CP 5	CP 6	CP 7
3.05	2.22	3.29	3.41	3.08	3.45	2.93

Berikut, daftar mata kuliah dengan nilai Indikator Kinerja kurang dari 2.75.

No	Mata Kuliah	Nilai IK
1	Matematika Dasar 1	2.37
2	Rangkaian logika	2.59
3	Matematika Teknik 1	2.36
4	Dasar Elektronika	1,93
5	Probabilitas dan Statistik	1,89
6	Antena dan Propagasi	2,50
7	Analisis Sistem Tenaga Listrik	1,73
8	Pengukuran Listrik	2.40
9	Rangkaian Listrik 1	2.61

Tim dosen terkhusus untuk mata kuliah dengan indikator kinerja kurang agar melakukan rapat analisis masalah dan perbaikan yang didokumentasikan dan disetor ke Unit Penjaminan Mutu (*Dr. A. Ejah Umraeni Salam, S.T., M.T.*).
Diharapkan nilai Indikator Kinerja mata kuliah ini dapat meningkat pada semester berikutnya dan mata kuliah lainnya untuk dipertahankan dan ditingkatkan.

Persiapan Pembelajaran Semester Akhir 2019/2020

Daftar Mata Kuliah dan Dosen Semester Akhir 2019/2020

NO	NAMA	SMS	MATA KULIAH	SKS
1	Prof. Dr. Ir. H. Muh. Tola, M.Eng.	ii	Praktikum Rangkaian Listrik	0.5
		vi	Elektronika Daya + Praktikum	1
			TOTAL	**1.5**
2	Dr. Ir. Yustinus, MT	vi	Elektronika Daya + Praktikum	**1**
		vi - viii	Opto Elektronika	**1**
		iv	Dasar Sistem Kendali	**1**
		ii	Pemograman Komputer	**1**
		ii	Praktikum Rangkaian Listrik	**0.5**

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				4.5
3	Dr. Ir. Zulfajri B. M.Eng.	vi	Management dan Regulasi Telekomunikasi	1
		vi	Teknologi Nirkabel	1
			TOTAL	**2**
4	Ir. Samuel Panggalo, MT	vi	Radar dan Navigasi	**1**
		vi	Sistem Telekomunikasi Cerdas	**1**
		ii	Praktikum Rangkaian Listrik	**0.5**
		ii	Sistem Digital	**1**
		ii	Pemograman Komputer	**1**
		vi	Kinerja Sistem Telekomunikasi	**1**
				5.5
5	Dr. Ir. Sri Mawar Said, MT.	vi	Sistem Proteksi II + Praktikum	2
		ii	Rangkaian Listrik II	3
		vi	Analisis Mesin Listrik 2 + Praktikum	1
		ii	Praktikum Rangkaian Listrik	1
			TOTAL	**7**
6	Ir. Zaenab Muslimin, MT	ii	Rangkaian Listrik II	3
		iv	Sistem Linier	2
		ii	Praktikum Rangkaian Listrik	0.5
		ii	Praktikum Rangkaian Listrik	0.5
			TOTAL	**6**
7	Dr. Yusran, ST., MT.	vi	Teknik Lingkungan	1
		iv	Mesin-Mesin Listrik	1
		vi	Teknik Lingkungan	1
		iv	Matematika Teknik II	1.5
		vi	Elektronikas Daya + Praktikum	1
		vi-viii	Opto Elektronika	1
		iv	Mesin-Mesin Listrik	1
			TOTAL	**7.5**
8	Dr. Ir. Rhiza S. Sadjad, MSEE	vi	Perancangan Sistem Kendali	1
		vi	Sistem Kendali Optimal	1
		iv	Dasar Sistem Kendali	1
		vi	Sistem kendali Digital + Praktikum	1
			TOTAL	**4**
9	Prof. Dr. Ir. Andani Ahmad, MT	vi	Perancangan Sistem Kendali	1
		vi	Spread Spektrum	1
		vi	Rekayasa Trafik	1
		iv	Praktikum Sistem Mikroprosessor dan Antarmuka	0.5
		iv	Praktikum Sistem Mikroprosessor dan Antarmuka	0.5
		ii	Sistem Digital	1
			TOTAL	**5**
10	Dr.Eng. Wardi, ST., M.Eng.	vi-viii	Topik Khusus Jaringan Telekomunikasi	2
		iv	Dasar Multimedia	1
		vi	Komunikasi Seluler	1

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		vi	Sistem (Jaringan) Multimedia	1
		iv	Dasar Multimedia	1
			TOTAL	**6**
11	Dr.Eng. Elyas, ST., M.Eng.	iv	Dasar Multimedia	1
		vi	Elektronika Telekomunikasi + Praktikum	1.5
		vi	Sistem Telekomunikasi Cerdas	1
		vi	Pengolahan Isyarat Multimedia + Praktikum	1
		vi	Management dan Regulasi Telekomunikasi	1
			TOTAL	**5.5**
12	Prof. Dr. Ir. Syafruddin Syarif, MT.	vi	Teori Informasi dan Pengkodean	2
		vi	Pengolahan Isyarat Digital	1
		vi	Teknologi Nirkabel	1
		vi	Pengolahan Citra	1
		vi	Kinerja Sistem Telekomunikasi	1
			TOTAL	**6**
13	Dr.Eng. Ir. Dewiani, MT	vi-viii	Optimasi Jaringan Telekomunikasi	1
		iv	Sistem Linier	1
		iv	Matematika Teknik II	1.5
		vi	Rekayasa Trafik	1
		vi	Komunikasi Seluler	1
			TOTAL	**5.5**
14	Dr.Eng. Intan Sari Areni, MT.	iv	Sistem Linier	1
		vi	Pengolahan Isyarat Digital	1
		vi	Tapis Analog dan Digital	1
		vi	Pengolahan Isyarat Multimedia + Praktikum	1
		iv	Matematika Teknik II	1.5
		iv	Sistem Linier	1
			TOTAL	**6.5**
15	Amil Ahmad Ilham, ST., MIT., PhD	vi	Algoritma dan Struktur Data	1
		ii	Sistem Digital	1
			TOTAL	**2**
16	Dr.Eng. Muh. Niswar, ST., M.Info.Tech.	ii	Sistem Digital	1
		ii	Pemograman Komputer	1
		vi	Pemograman Berorientasi Obyek	1
			TOTAL	**3**
17	Dr. Indar Chaerah, ST., MT.	vi	Teknik Lingkungan	1
		iv	Mesin-Mesin Listrik	1
		iv	Dasar Sistem Kendali	1
			TOTAL	**3**
18	Ardiaty Arief, ST., MTM., PhD.	vi	Konversi Energi	1
		vi	Operasi Sistem tenaga Listrik	1
		vi	Operasi Sistem tenaga Listrik	1
			TOTAL	**3**

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19	Dr. Ir. Zahir Zainuddin, M.Sc.	iv	Sistem Mikroprosesor dan Antarmuka	1
		iv	Sistem Mikroprocessor dan Antarmuka	1
		vi-viii	Sistem kecerdasan buatan	1
			TOTAL	**3**
20	Dr. A. Ejah Umraeni Salam, ST., MT.	iv	Dasar Sistem Kendali	1
		iv	Sistem Linier	1
		vi	Sistem Kendali Optimal	1
		vi	Sistem kendali Digital + Praktikum	1
		vi-viii	Sistem kecerdasan buatan	1
			TOTAL	**5**
21	Prof. Dr. Ir. Nadjamuddin Harun, MS.	vi	Teknik Lingkungan	1
		iv	Dasar Sistem Kendali	1
		iv	Dasar Sistem Kendali	1
			TOTAL	**3**
22	Dr.-Ing. Faizal Arya Samman, ST., MT.	iv	Praktikum Elektronika Terintegrasi	1
		ii	Sistem Digital	1
		ii	Praktikum Sistem Digital	1
		vi	Perancangan Sistem Tersemat + Praktikum	1
		iv	Elektronika Terintegrasi	2
			TOTAL	**6**
23	Andreas Vogel, Dipl.-Ing.	ii	Praktikum Sistem Digital	**1**
		vi	Perancangan Sistem Tersemat + Praktikum	**1**
		iv	Elektronika Terintegrasi	**1**
		iv	Praktikum Elektronika Terintegrasi	**1**
			TOTAL	**4**
24	Merna Baharuddin, ST., M.Tel.Eng., PhD.	iv	Dasar Multimedia	1
		iv	Elektronika Telekomunikasi + Praktikum	1.5
		vi	Tapis Analog dan Digital	1
		vi	Spread Spectrum	1
		vi	Pengolahan Citra	1
		iv	Dasar Multimedia	1
		iv	Dasar Multimedia	1
			TOTAL	**7.5**
25	Muhammad Bachtiar Nappu, ST., MT.M.Phil., PhD.	vi	Metode Numerik	1
		vi	Operasi Sistem tenaga Listrik	1
		vi	Operasi Sistem tenaga Listrik	1
			TOTAL	**3**
26	Hasniati, ST., MT.	ii	Praktikum Rangkaian Listrik	0.5
		ii	Rangkaian Listrik II	1.5
		iv	Matematika Teknik II	1.5

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			TOTAL	**3.5**
27	Ida Rachmaniar Sahali, ST., MT.			
		vi	Sistem Operasi Komputer	1
		vi	Pemograman Berorientasi Obyek	1
		ii	Pemogram Komputer	1
		vi	Pemograman Komputer Lanjut	1
		ii	Sistem Digital	1
			TOTAL	**5**
28	Dr. Ikhlas Kitta, ST., MT.	vi	Teknik Tegangan Tinggi + Praktikum	1
		vi	Distribusi Tenaga Listrik + Praktikum	1
		vi	Distribusi Tenaga Listrik + Praktikum	1
		iv	Instalasi Listrik + Praktikum	1
		iv	Instalasi Listrik + Praktikum	1
			TOTAL	**5**
29	Ir. Gassing, MT.	iv	Mesin-Mesin Listrik	2
		iv	Instalasi Listrik + Praktikum	1
		vi	Metode Numerik	1
		vi	Metode Numerik	1
			TOTAL	**5**
30	Andini Dani Achmad, ST., MT.	ii	Pemograman Komputer	1
		iv	Matematika Teknik II	1.5
		vi	Sistem (Jaringan) Multimedia	1
		vi	Optimasi Jaringan Telekomunikasi	1
		ii	Sistem Digital	1
			TOTAL	**5.5**
31	Prof. Dr. Ir. Ansar Suyuti, MT.	vi	Algoritma dan Struktur Data	1
		iv	Mesin-Mesin Listrik	1
		iv	Instalasi Listrik + Praktikum	1
		vi	Manajemen dan Kewirausahaan	2
		vi	Manajemen dan Kewirausahaan	2
			TOTAL	**7**
32	Prof. Dr. Ir. Salama Manjang, MT.	vi	Teknik Tegangan Tinggi + Praktikum	1
		vi	Teknik Tegangan Tinggi + Praktikum	1
		vi	Distribusi Tenaga Listrik + Praktikum	1
		vi	Distribusi Tenaga Listrik + Praktikum	1
			TOTAL	**4**
33	Dr.Eng. Yusri Syam Akil, ST., MT.	vi	Konversi Energi	2
		vi	Analisis Mesin Listrik 2 + Praktikum	1
			TOTAL	**3**
34	Muh. Anshar, ST., M.Sc., PhD.	iv	Sistem Mikroprosesor dan Antarmuka	2
		iv	Prak. Sist. MIkroprocessor dan Antarmuka	0.5
		vi	Pemograman Komputer Lanjut	1
		iv	Praktikum Sistem Mikroprocessor dan Antarmuka	0.5
		vi	Sistem Kendali Cerdas	1
			TOTAL	**5**
35	Dr. Ir. Ingrid Nurtanio, MT.	iv	Matematika Teknik II	1.5
		vi	Sistem Kendali Cerdas	1

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			TOTAL	**2.5**
36	Ir. Christoforus, MT.			
		iv	Sistem Mikroprosesor dan Antarmuka	1
		iv	Sistem Mikroprosesor dan Antarmuka	1
		vi	Sistem Operasi Komputer	1
			TOTAL	**3**
37	Prof. Dr.Eng. Syafaruddin, ST., M.Eng.	vi	Konversi Energi	1
		vi-viii	Sumber Energi Baru Terbarukan	2
		ii	Rangkaian ListrikII	1.5
		ii	Praktikum Rangkaian Listrik II	0.5
		vi	Metode Numerik	1
			TOTAL	**6**
38	Prof. Dr. Muh. Arief, Dipl. Ing.	vi	Teknik Tegangan Tinggi + Praktikum	1
			TOTAL	**1**
39	Azran	ii	Pemograman Komputer	1
		ii	Praktikum Rangkaian Listrik II	0.5
		vi	Radar dan Navigasi	1
			TOTAL	**2.5**

Gowa, 08 Januari 2020
Ketua Departemen Teknik Elektro

Prof. Dr. Ir. Salama Manjang, M.T.
NIP. 19621231 199003 1 024

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MEETING NOTES

Date and Time : Wednesday, 8th of January 2020
10.00 WITA - End
Place : Meeting Room, Department of Electrical Engineering, Unhas
Topics : 1. Teaching Evaluation of 2019/2020 First Semester
2. Teaching Preparation of 2019/2020 Last Semester

Teaching Evaluation of 2019/2020 First Semester

Index of Graduate Learning Target (SO)

SO 1	SO 2	SO 3	SO 4	SO 5	SO 6	SO 7
3.05	2.22	3.29	3.41	3.08	3.45	2.93

List of courses with performance indicator (PI) value less than 2.75

No	Courses	PI
1	Calculus 1	2.37
2	Logic Circuits	2.59
3	Advanced Mathematics 1	2.36
4	Basic Electronics	1,93
5	Probability and Statistics	1,89
6	Antenna and Propagation	2,50
7	Electric Power System Analysis	1,73
8	Electric Measurement	2.40
9	Electric Circuits 1	2.61

Teaching team of courses with low performance indicator (PI) value will conduct the meeting to analysis the possible problems and its solutions. The meeting will be documented and given to quality assurance unit (*Dr. A. Ejah Umraeni Salam, S.T., M.T.*).
Performance indicator value of the listed courses is expected to increase in the next semester and other courses with proper PI Value are sustained and improved.

Teaching Preparation of 2019/2020 Last Semester

List of Courses and Lecturers for Last Semester of 2019/2020

NO	LECTURERS	SMS	COURSES	CREDIT
1	Prof. Dr. Ir. H. Muh. Tola, M.Eng.	ii	Electric Circuits Laboratory	0.5
		vi	Power Electronics + Laboratory	1
			TOTAL	**1.5**
2	Dr. Ir. Yustinus, MT	vi	Power Electronics + Laboratory	**1**
		vi - viii	Optoelectronics	**1**
		iv	Basic Control Systems	**1**
		ii	Computer Programming	**1**

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		ii	Electric Circuits Laboratory	**0.5**
				4.5
3	Dr. Ir. Zulfajri B. M.Eng.	vi	Telecommunication Management and Regulations	1
		vi	Wireless Technology	1
			TOTAL	**2**
4	Ir. Samuel Panggalo, MT	vi	Radar and Navigation	**1**
		vi	Smart Telecommunication Systems	**1**
		ii	Electric Circuits Laboratory	**0.5**
		ii	Digital Systems	**1**
		ii	Computer Programming	**1**
		vi	Performance Telecommunication Systems	**1**
				5.5
5	Dr. Ir. Sri Mawar Said, MT.	vi	Electric Power Protection System 2 + Lab	2
		ii	Electric Circuits II	3
		vi	Electric Machines Analysis 2 + Laboratory	1
		ii	Electric Circuits Laboratory	1
			TOTAL	**7**
6	Ir. Zaenab Muslimin, MT	ii	Electric Circuits II	3
		iv	Linear Systems	2
		ii	Electric Circuits Laboratory	0.5
		ii	Electric Circuits Laboratory	0.5
			TOTAL	**6**
7	Dr. Yusran, ST., MT.	vi	Environmental Science	1
		iv	Electric Machines	1
		vi	Environmental Science	1
		iv	Advanced Mathematics 2	1.5
		vi	Power Electronics + Laboratory	1
		vi-viii	Optoelectronics	1
		iv	Electric Machines	1
			TOTAL	**7.5**
8	Dr. Ir. Rhiza S. Sadjad, MSEE	vi	Control Systems Design	1
		vi	Optimal Control Systems	1
		iv	Basic Control Systems	1
		vi	Digital Control Systems + Laboratory	1
			TOTAL	**4**
9	Prof. Dr. Ir. Andani Ahmad, MT	vi	Control Systems Design	1

		vi	Spread Spectrum	1
		vi	Telecommunication Traffic Engineering	1
		iv	Microprocessor Systems and Interface Laboratory	0.5
		iv	Microprocessor Systems and Interface Laboratory	0.5
		ii	Digital Systems	1
			TOTAL	**5**
10	Dr.Eng. Wardi, ST., M.Eng.	vi-viii	Special Topic of Telecommunication Network	2
		iv	Basic Multimedia	1
		vi	Cellular Communication	1
		vi	Multimedia (Network) Systems	1
		iv	Basic Multimedia	1
			TOTAL	**6**
11	Dr.Eng. Elyas, ST., M.Eng.	iv	Basic Multimedia	1
		vi	Telecommunication Electronics + Laboratory	1.5
		vi	Smart Telecommunication Systems	1
		vi	Multimedia Signal Processing + Laboratory	1
		vi	Telecomm. Management and Regulations	1
			TOTAL	**5.5**
12	Prof. Dr. Ir. Syafruddin Syarif, MT.	vi	Information Theory and Coding	2
		vi	Digital Signal Processing	1
		vi	Wireless technology	1
		vi	Image Processing	1
		vi	Performance Telecommunication Systems	1
			TOTAL	**6**
13	Dr.Eng. Ir. Dewiani, MT	vi-viii	Telecommunication Network Optimization	1
		iv	Linear Systems	1
		iv	Advanced Mathematics 2	1.5
		vi	Telecommunication Traffic Engineering	1
		vi	Cellular Communications	1
			TOTAL	**5.5**
14	Dr.Eng. Intan Sari Areni, MT.	iv	Linear Systems	1
		vi	Digital Signal Processing	1
		vi	Analog and Digital Filter	1
		vi	Multimedia Signal Processing + Laboratory	1
		iv	Advanced Mathematics 2	1.5
		iv	Linear Systems	1
			TOTAL	**6.5**

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15	Amil Ahmad Ilham, ST., MIT., PhD	vi	Algorithm and Data Structures	1
		ii	Digital Systems	1
			TOTAL	**2**
16	Dr.Eng. Muh. Niswar, ST., M.Info.Tech.	ii	Digital Systems	1
		ii	Computer Programming	1
		vi	Object Oriented Programming	1
			TOTAL	**3**
17	Dr. Indar Chaerah, ST., MT.	vi	Environmental Science	1
		iv	Eelctric Machines	1
		iv	Basic Control Systems	1
			TOTAL	**3**
18	Ardiaty Arief, ST., MTM., PhD.	vi	Energy Conversion	1
		vi	Power Systems Operations	1
		vi	Power Systems Operations	1
			TOTAL	**3**
19	Dr. Ir. Zahir Zainuddin, M.Sc.	iv	Microprocessor Systems and Interfaces	1
		iv	Microprocessor Systems and Interfaces	1
		vi-viii	Artificial Intelligence Systems	1
			TOTAL	**3**
20	Dr. A. Ejah Umraeni Salam, ST., MT.	iv	Basic Control Systems	1
		iv	Linear Systems	1
		vi	Optimal Control Systems	1
		vi	Digital Control Systems + Laboratory	1
		vi-viii	Artificial Intelligence Systems	1
			TOTAL	**5**
21	Prof. Dr. Ir. Nadjamuddin Harun, MS.	vi	Environmental Science	1
		iv	Basic Control Systems	1
		iv	Basic Control Systems	1
			TOTAL	**3**
22	Dr.-Ing. Faizal Arya Samman, ST., MT.	iv	Integrated Electronics Laboratory	1
		ii	Digital Systems	1
		ii	Digital Systems Laboratory	1
		vi	Embedded Systems Design + Laboratory	1
		iv	Integrated Electronics	2

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			TOTAL	**6**
23	Andreas Vogel, Dipl.-Ing.	ii	Digital Systems Laboratory	**1**
		vi	Embedded Systems Design + Laboratory	**1**
		iv	Integrated Electronics	**1**
		iv	Integrated Electronics Laboratory	**1**
			TOTAL	**4**
24	Merna Baharuddin, ST., M.Tel.Eng., PhD.	iv	Basic Multimedia	1
		iv	Telecommunication Electronics + Laboratory	1.5
		vi	Analog and Digital Filter	1
		vi	Spread Spectrum	1
		vi	Image Processing	1
		iv	Basic Multimedia	1
		iv	Basic Multimedia	1
			TOTAL	**7.5**
25	Muhammad Bachtiar Nappu, ST., MT.M.Phil., PhD.	vi	Numerical Methods	1
		vi	Power Systems Operations	1
		vi	Power Systems Operations	1
			TOTAL	**3**
26	Hasniati, ST., MT.	ii	Electric Circuits Laboratory	0.5
		ii	Electric Circuits II	1.5
		iv	Advanced Mathematics II	1.5
			TOTAL	**3.5**
27	Ida Rachmaniar Sahali, ST., MT.			
		vi	Operational Computer Systems	1
		vi	Object Oriented Programming	1
		ii	Computer Programming	1
		vi	Advanced Computer programming	1
		ii	Digital Systems	1
			TOTAL	**5**
28	Dr. Ikhlas Kitta, ST., MT.	vi	High Voltage Engineering + Laboratory	1
		vi	Electric Power Distribution + Laboratory	1
		vi	Electric Power Distribution + Laboratory	1
		iv	Electric Installation + Laboratory	1
		iv	Electric Installation + Laboratory	1
			TOTAL	**5**

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29	Ir. Gassing, MT.	iv	Electric Machines	2
		iv	Electric Installation + Laboratory	1
		vi	Numerical Methods	1
		vi	Numerical Methods	1
			TOTAL	**5**
30	Andini Dani Achmad, ST., MT.	ii	Computer Programming	1
		iv	Advanced Mathematics 2	1.5
		vi	Multimedia (Network) Systems	1
		vi	Telecommunication Network Optimization	1
		ii	Digital Systems	1
			TOTAL	**5.5**
31	Prof. Dr. Ir. Ansar Suyuti, MT.	vi	Algorithms and Data Structures	1
		iv	Electric Machines	1
		iv	Electric Installation + Laboratory	1
		vi	Management and Entrepreneurship	2
		vi	Management and Entrepreneurship	2
			TOTAL	**7**
32	Prof. Dr. Ir. Salama Manjang, MT.	vi	High Voltage Engineering + Laboratory	1
		vi	High Voltage Engineering + Laboratory	1
		vi	Power Electric Distributions + Laboratory	1
		vi	Power Electric Distributions + Laboratory	1
			TOTAL	**4**
33	Dr.Eng. Yusri Syam Akil, ST., MT.	vi	Energy Conversions	2
		vi	Electric Machines Analysis 2 + Laboratory	1
			TOTAL	**3**
34	Muh. Anshar, ST., M.Sc., PhD.	iv	Microprocessor Systems and Interfaces	2
		iv	Microprocessor Systems and Interfaces Lab	0.5
		vi	Advanced Computer Programming	1
		iv	Microprocessor Systems and Interfaces Lab	0.5
		vi	Smart Control Systems	1
			TOTAL	**5**
35	Dr. Ir. Ingrid Nurtanio, MT.	iv	Advanced Mathematics 2	1.5
		vi	Smart Control Systems	1
			TOTAL	**2.5**
36	Ir. Christoforus, MT.			
		iv	Microprocessor Systems and Interfaces	1

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		iv	Microprocessor Systems and Interfaces	1
		vi	Computer Operational Systems	1
			TOTAL	**3**
37	Prof. Dr.Eng. Syafaruddin, ST., M.Eng.	vi	Energy Conversion	1
		vi-viii	Renewable Energy	2
		ii	Electric Circuits 2	1.5
		ii	Electric Circuits Laboratory	0.5
		vi	Numerical Methods	1
			TOTAL	**6**
38	Prof. Dr. Muh. Arief, Dipl. Ing.	vi	High Voltage Engineering + Laboratory	1
			TOTAL	**1**
39	Azran	ii	Computer Programming	1
		ii	Electric Circuits Laboratory	0.5
		vi	Radar and Navigation	1
			TOTAL	**2.5**

Gowa, 08th of January 2020
Head of Electrical Engineering

signed

Prof. Dr. Ir. Salama manjang, M.T.
NIP. 19621231 199003 1 024

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Nomor : **7443/UN4.7.7/D1.03/2020**
Lampiran : -
Hal : **Undangan Rapat**

Yth. : Bapak/Ibu Dosen DepartemenTeknik Elektro
Di -
M a k a s s a r

Sehubungan dengan akan dimulainya perkuliahan semester awal 2020/2021 maka kami mengundang Bapak/Ibu Dosen untuk menghadiri rapat, yang Insya Allah akan dilaksanakan pada:

Hari / Tanggal	:	Rabu, 24 Juni 2020
W a k t u	:	Pukul 10.00 Wita s.d selesai
T e m p a t	:	Ruang Rapat Departemen Teknik Elektro
A g e n d a	:	- Evaluasi Pembelajaran Semester Akhir 2019/2020
		- Persiapan Pembelajaran Semester Awal 2020/2021
		- dll yang dianggap perlu

Mengingat pentingnya kegiatan ini partisipasi Bapak/Ibu dalam mengikuti rapat ini sangat diharapkan tepat pada waktunya, atas perhatian dan partisipasinya disampaikan terima kasih.

Gowa, 18 Juni 2020
Ketua Departemen Teknik Elektro,

Prof. Dr. Ir. Salama Manjang, M.T.
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NOTULENSI RAPAT

Hari/Tanggal : Rabu, 24 Juni 2020
Waktu : 10.00 – selesai (WITA)
Tempat : Ruang Rapat Departemen Teknik Elektro
Agenda : 1. Evaluasi pembelajaran semester akhir 2019/2020
2. Persiapan pembelajaran semester awal 2020/2021

Evaluasi Pembelajaran Semester Akhir 2019/2020

Indeks Capaian Pembelajaran Lulusan

CP 1	CP 2	CP 3	CP 4	CP 5	CP 6	CP 7
3.20	2.99	3.06	3.66	3.28	3.18	2.77

Berikut, daftar mata kuliah dengan nilai Indikator Kinerja kurang dari 2.75.

No	Mata kuliah	Nilai Rata-Rata MK
1	Matematika Dasar 2	2.08
2	Elektronika Terintegrasi	2.24
3	Dasar Sistem Kendali	2.59
4	Sistem Kendali Digital + Prak	2.56

Tim dosen terkhusus untuk mata kuliah dengan indikator kinerja kurang agar melakukan rapat analisis masalah dan perbaikan yang didokumentasikan dan disetor ke Unit Penjaminan Mutu (*Dr. A. Ejah Umraeni Salam, S.T., M.T.*).
Diharapkan nilai Indikator Kinerja mata kuliah ini dapat meningkat pada semester berikutnya dan mata kuliah lainnya untuk dipertahankan dan ditingkatkan.

Persiapan Pembelajaran Semester Awal 2020/2021

Daftar Mata Kuliah dan Dosen Semester Awal 2020/2021

NO	NAMA	SMS	MATA KULIAH	SKS
1	PROF. DR. IR. H. MUH. TOLA, M.ENG.	7	Opto Elektronik	2
		3	Fisika Teknik	1
		5	Iluminasi	2
			TOTAL	**5**
2	Dr. Ir. Sri Mawar Said, MT.	1	Rangkaian Listrik 1	3
		3	Dasar Tenaga Listrik	1
		3	Dasar Tenaga Listrik	1
		3	Praktikum Dasar Tenaga Listrik	0.2
		5	Sistem Proteksi 1	2
			TOTAL	**7.2**
3	Ir. Zaenab Muslimin	1	Rangkaian Listrik 1	3
		5	Probabilitas dan Statistik	2
			TOTAL	**5**
4	Dr. Yusran, ST., MT.	3	Fisika Teknik	1

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		5	Pengukuran Listrik	1
			Pembangkit Tenaga Listrik	1
		1	Kimia Teknik	1
			TOTAL	**4**
5	Dr. Ir. Rhiza S. Sadjad, MSEE	5	Sistem Kendali + Praktikum	1.5
		5	Teknologi Kendali Proses	1
		5	Rangkaian Penguat Operasional	1
			TOTAL	**3.5**
6	Dr. Ir. Andani Ahmad, MT	1	Rangkaian Logika	1
		3	Dasar Elektronika	1
		5	Teknologi Kendali Proses	1
		5	Divais Mikroelektronika	2
		5	Probabilitas dan Statistik	1
		5	Probabilitas dan Statistik	1
		5	Komunikasi Serat Optik	1
		3	Praktikum Dasar Elektronika	0.2
			TOTAL	**8.2**
7	Dr. Adnan, ST., MT	1		
		5	Arsitektur Komputer 1 + Praktikum	1.5
			TOTAL	**1.5**
8	Dr.Eng. Wardi, ST., M.Eng.	7	Topik Khusus Jaringan Telekomunikasi	1
		1	Rangkaian Logika	1
		3	Dasar Elektronika	1
		3	Dasar Telekomunikasi	1
		5	Komunikasi Data	1
		3	Praktikum Dasar Elektronika	0.2
		3	Praktikum Dasar Telekomunikasi	0.2
			TOTAL	**5.4**
9	Dr.Eng. Elyas, ST., M.Eng.	5	Medan Elektromagnetik	2
		5	Medan Elektromagnetik	1
		5	Antena dan Propagasi + Praktikum	1.5
		5	Sistem Transmisi dan Frek. Tinggi + Prak.	1.5
		5	Mobile Programming	1
			TOTAL	**7**
10	Dr. Ir. SyafruddinSyarif, MT.	5	Perancangan Jaringan Teresterial	1
		5	Sistem Saluran Komunikasi Tenaga Listrik	1
		5	Komunikasi Digital	1
		7	Praktikum Dasar Telekomunikasi Metode Penelitian dan Penulisan Ilmiah	1
		5	Perangkat Lunak Telekomunikasi	2
			TOTAL	**6**
11	Dr. Ir. Zulfajri B., M.Eng.	5	Perancangan Jaringan Teresterial	1
		5	Probabilitas dan Statistik	1
		5	Komunikasi Satelit	2
		7	Sistem Informasi Telekomunikasi	2
			TOTAL	**6**
12	Dr.Eng. Ir. Dewiani, MT	5	Jaringan Telekomunikasi Telepon	1
		5	Probabilitas dan Statistik	1
		3	Dasar Telekomunikasi	1

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		3	Matematika Teknik 1	1.5
		5	Teknologi *Switching* + PRAKTIKUM	1
		5	Komunikasi Serat Optik	1
		7	Metode Penelitian dan Penulisan Ilmiah	1
		3	Praktikum Dasar Telekomunikasi	0.2
			TOTAL	**7.7**
13	Dr.Eng. Intan Sari Areni, MT.	5	Jaringan Telekomunikasi Telepon	1
		5	Sistem Saluran Komunikasi Tenaga Listrik	1
		3	Dasar Telekomunikasi	1
		3	Matematika Teknik 1	1.5
		3	Matematika Teknik 1	1.5
		2	Topik Khusus Wireless	1
		5	Komunikasi Digital	1
		3	Praktikum Dasar Telekomunikasi	0.2
			TOTAL	**8.2**
14	Amil Ahmad Ilham, ST., MIT., PhD	5	Web Programming	1
		5	Cloud Computing	1
			TOTAL	**3.5**
15	Dr.Eng. Muh. Niswar, ST., M.Info.Tech.	5	Web Programming	1
		5	Cloud Computing	1
		5	Jaringan Komputer + Praktikum	1
		5	Mobile Programming	1
		1	Rangkaian Logika	1
			TOTAL	**5**
16	Dr. Indar Chaerah, ST., MT.	7	Teknik Kendali Sistem Tenaga Listrik	1
		5	Kendali dan Kestabilian STL	1
		5	Pengukuran Listrik	1
		3	Dasar Tenaga Listrik	1
		3	Praktikum Dasar Tenaga Listrik	0.2
			Analisis STL	1
		3	Fisika Teknik	1
			TOTAL	**6.2**
17	Ardiaty Arief, ST., MTM., PhD.	5	Transmisi Arus Bolak Balik	1
		5	Analisis STL	1
		5	Kendali dan Kestabilan STL	1
			TOTAL	**3**
18	Dr. Ir. Zahir Zainuddin, M.Sc.			
		5	Rangkaian Penguat Operasional	1
		5	Sistem Instrumentasi Elektronika + Prak.	1.5
		1	Menggambar Teknik	1
		5	Sistem Berbasis Mikroprocesor + Praktikum	1.5
			TOTAL	**5**
19	Dr. A. Ejah Umraeni Salam, ST., MT.	1	Rangkaian Logika	2
		5	Sistem Kendali + Praktikum	1.5
		3	Dasar Elektronika	1
		5	Sistem Instrumentasi Elektronika + Prak.	1.5

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		5	Medan Elektromagnetik	1
		3	Praktikum Dasar Elektronika	0.2
			TOTAL	**7.2**
20	Prof. Dr. Ir. Nadjamuddin Harun, MS.	7	Sumber Energi Baru Terbarukan	2
		5	Pembangkit Tenaga Listrik	1
			TOTAL	**3**
21	Dr.-Ing. Faizal Arya Samman, ST., MT.	5	Perancangan Sistem Digital + Praktikum	1.5
		3	Dasar Elektronika	1
		3	Dasar Elektronika	1
		7	Sistem dalam sebuah chip	1
		5	Teknologi Rangkaian Terintegrasi	1
		3	Praktikum Dasar Elektronika	0.2
			TOTAL	**5.7**
22	Merna Baharuddin, ST., M.Tel.Eng., PhD.	5	Antena dan Propagasi + Praktikum	1.5
		7	Topik khusus Jaringan Telekomunikasi	1
		3	Dasar Telekomunikasi	2
		3	Praktikum Dasar Telekomunikasi	0.2
		5	Saluran Transmisi Telekomunikasi	1
		5	Teknologi Jaringan Akses	1
		5	Sistem Transmisi dan Frek. Tinggi Prak.	1.5
			TOTAL	**8.2**
23	Muhammad Bachtiar Nappu, St., MT.M.Phil., PhD.	7	Pasar Ketenagalistrikan	2
		7	Perkiraan Beban Listrik	2
		3	Fisika Teknik	1
		5	Pengukuran Listrik	1
			TOTAL	**6**
24	Hasniati, ST., MT	1	Kimia Teknik	1
		1	Rangkaian Listrik 1	1.5
		3	Fisika Teknik	1.5
			TOTAL	**4**
25	Ida Rachmaniar Sahali, ST., MT.	5	Arsitektur Komputer 1 + Praktikum	1.5
		5	Jaringan Komputer + Praktikum	1
		5	Komunikasi Data	1
		5	Otomasi Industri + Praktikum	1
			TOTAL	**4.5**
26	Dr. Ikhlas Kitta, ST., MT.	5	Transmisi Arus Bolak Balik	1
		3	Material Elektro Teknik	1
		3	Dasar Tenaga Listrik	1
		3	Praktikum Dasar Tenaga Listrik	0.2
		3	Material Elektro Teknik	1
			TOTAL	**4.2**
27	Dr. Indrabayu, St., MT. M.Bus.Sys.	7	Topik Khusus Wireless	1
		5	Ekonomi Teknik	2
		7	Sistem Kecerdasan Buatan	1
			TOTAL	**4**
28	Ir. Gassing, MT.	7	Gardu Induk dan Peralatan STL	2
		1	Kimia Teknik	2
		3	Dasar Tenaga Listrik	1

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		3	Praktikum Dasar Tenaga Listrik	0.2
		5	Analisis Mesin Listrik 1 + Praktikum	1
		5	Scada Berbasis Jaringan Komputer	1
			TOTAL	**7.2**
29	Andini Dani Achmad, ST., MT.	5	Saluran Transmisi Telekomunikasi	1
		1	Rangkaian Logika	1
		3	Dasar Telekomunikasi	1
		3	Praktikum Dasar Telekomunikasi	0.2
		3	Matematika teknik 1	1.5
		5	Teknologi Jaringan Akses	1
		5	Teknologi *Switching* + PRAKTIKUM	1
			TOTAL	**6.7**
30	Prof. Ir. Ansar Suyuti, MT.	5	Pengukuran Listrik	1
		5	Ekonomi Teknik	2
		7	Penggunaan Motor Listrik	1
		5	Ekonomi Teknik	2
			TOTAL	**6**
31	Prof. Dr. Ir. Salama Manjang, MT.	3	Material Elektro Teknik	1
		3	Material Elektro Teknik	1
		5	Medan Elektromagnetik	1
		7	Metode Penelitian dan Penulisan Ilmiah	1
		7	Metode Penelitian dan Penulisan Ilmiah	1
			TOTAL	**5**
32	Dr.Eng. Yusri Syam Akil, ST., MT.	5	Pengukuran Listrik	1
		5	Pengukuran Listrik	1
		3	Dasar Tenaga Listrik	1
		3	Praktikum Dasar Tenaga Listrik	0.2
		5	Analisis Mesin Listrik 1 + Praktikum	1
		7	Penggunaan Motor Listrik	1
		7	Manajemen Energi	2
			TOTAL	**7.2**
33	Muh. Anshar, ST., M.Sc.	5	Robotika Industri	1
		5	Sistem Berbasis Mikroprocesor + Praktikum	1.5
		1	Menggambar Teknik	1
		1	Menggambar Teknik	1
		1	DASAR ELEKTRONIKA	1
		3	Praktikum Dasar Elektronika	0.2
			TOTAL	**5.7**
34	Dr. Ir. Ingrid Nurtanio, MT.	3	Matematika Teknik 1	1.5
			TOTAL	**1.5**
35	Ir. Christoforus, MT.	5	Robotika Industri	1
		5	Otomasi Industri + Praktikum	1
		3	Kimia Teknik	1
		5	Scada Berbasis Jaringan Komputer	1
			TOTAL	**4**
36	Prof. Dr.Eng. Syafaruddin, ST., M.Eng.	5		
		7	Sistem Penyimpanan Energi	2
		7	Sistem Cerdas Tenaga Listrik	2
			Rangkaian Listrik 1	1.5

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	7	Metode Penelitian dan Penulisan Ilmiah	1
	7	Metode Penelitian dan Penulisan Ilmiah	1
		TOTAL	**7.5**
Andreas	5	Perancangan Sistem Digital + Praktikum	1.5
	7	Sistem dalam sebuah chip	1
	5	Teknologi Rangkaian Terintegrasi	1
		TOTAL	**3.5**
Azran Budi Arief, ST, M.T	3	Matematika Teknik	1.5
	1	Menggambar Teknik	1
	3	Medan Elektromagnetik	1
	3	Kimia Teknik	1
Seminar proposal		**TOTAL**	**4.5**

Gowa, 24 Juni 2020
Ketua Departemen Teknik Elektro,

Prof. Dr. Ir. Salama Manjang, M.T.
NIP. 19621231 199003 1 024

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MEETING NOTES

Date and Time : Wednesday, 24th of June 2020
10.00 WITA - End
Place : Meeting Room, Department of Electrical Engineering
Topics : 1. Teaching Evaluation of 2019/2020 Last Semester
2. Teaching Preparation of 2020/2021 First Semester

Teaching Evaluation of 2019/2020 Last Semester

Index of Student Outcome Target (SO)

SO 1	SO 2	SO 3	SO 4	SO 5	SO 6	SO 7
3.20	2.99	3.06	3.66	3.28	3.18	2.77

List of courses with performance indicator (PI) value less than 2.75

No	COURSES	PI VALUE
1	Advanced Mathematics 2	2.08
2	Integrated Electronics	2.24
3	Basic Control Systems	2.59
4	Digital Control Systems + Laboratory	2.56

Teaching team of courses with low performance indicator (PI) value will conduct the meeting to analysis the possible problems and its solutions. The meeting will be documented and given to quality assurance unit (*Dr. A. Ejah Umraeni Salam, S.T., M.T.*).
Performance indicator value of the listed courses is expected to increase in the next semester and other courses with proper IK Value are sustained and improved.

Teaching Preparation of 2020/2021 First Semester

List of Courses and Lecturers for First Semester of 2020/2021

NO	NAME	SMS	COURSE	CREDIT
1	PROF. DR. IR. H. MUH. TOLA, M.ENG.	7	Opto Electronics	2
		3	Engineering Physics	1
		5	Illumination	2
			TOTAL	**5**
2	Dr. Ir. Sri Mawar Said, MT.	1	Electric Circuit 1	3
		3	Basic of Power Engineering	1
		3	Basic of Power Engineering	1
		3	Basic of Power Engineering Lab	0.2
		5	Protection System 1	2
			TOTAL	**7.2**
3	Ir. Zaenab Muslimin	1	Electric Circuit 1	3
		5	Probability and Statistics	2
			TOTAL	**5**
4	Dr. Yusran, ST., MT.	3	Engineering Physics	1
		5	Electrical Measurement	1
			Power Electrical Generation	1
		1	Engineering Chemical	1

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			TOTAL	**4**
5	Dr. Ir. Rhiza S. Sadjad, MSEE	5	Control System and Lab	1.5
		5	Process Control Technology	1
		5	Operational Amplifier Circuit	1
			TOTAL	**3.5**
6	Dr. Ir. Andani Ahmad, MT	1	Logic Circuit	1
		3	Basic of Electronics	1
		5	Process Control Technology	1
		5	Microelectronics Device	2
		5	Probability and Statistics	1
		5	Probability and Statistics	1
		5	Fiber Optics Communication	1
		3	Basic Electronics Lab	0.2
			TOTAL	**8.2**
7	Dr. Adnan, ST., MT	1		
		5	Computer Architecture 1 + Lab	1.5
			TOTAL	**1.5**
8	Dr.Eng. Wardi, ST., M.Eng.	7	Special Topics on Telecommunication Network	1
		1	Logic Circuits	1
		3	Basic of Electronics	1
		3	Basic of Telecommunication	1
		5	Data Communication	1
		3	Basic Electronics Lab	0.2
		3	Basic of Telecommunication Lab	0.2
			TOTAL	**5.4**
9	Dr.Eng. Elyas, ST., M.Eng.	5	Electromagnetics Field	2
		5	Electromagnetics Field	1
		5	Antenna and Propagation + Lab	1.5
		5	Transmission System and High Frequency + Lab	1.5
		5	Mobile Programming	1
			TOTAL	**7**
10	Dr. Ir. SyafruddinSyarif, MT.	7	Terrestrial Network Planning	1
		5	Power Electrical Communication Network System	1
		5	Digital Communication	1
		7	Research Methodology and Scientific Writing	1
		7	Telecommunication Software	2
			TOTAL	**6**
11	Dr. Ir. Zulfajri B., M.Eng.	5	Terrestrial Network Planning	1
		5	Probability and Statistics	1
		5	Satellite Communication	2
		7	Telecommunication Information System	2
			TOTAL	**6**
12	Dr.Eng. Ir. Dewiani, MT	5	Telecommunication Network	1
		5	Probability and Statistics	1
		3	Basic of Telecommunication	1
		3	Advanced Mathematics 1	1.5
		5	Switching Technology + Lab	1
		5	Fiber Optics Communication	1
		7	Research Methodology and Scientific Writing	1
		3	Basic Telecommunication Lab	0.2
			TOTAL	**8**
13	Dr.Eng. Intan Sari Areni, MT.	5	Telecommunication Networks	1
		5	Power Electrical Communication Network System	1
		3	Basic Telecommunication	1

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		3	Advanced Mathematics 1	1.5
		3	Advanced Mathematics 1	1.5
		7	Special Topics Wireless Communication	1
		5	Digital Communication	1
		3	Basic Telecommunication Lab	0.2
			TOTAL	**8.2**
14	Amil Ahmad Ilham, ST., MIT., PhD	5	Web Programming	1
		5	Cloud Computing	1
			TOTAL	**2.0**
15	Dr.Eng. Muh. Niswar, ST., M.Info.Tech.	5	Web Programming	1
		5	Cloud Computing	1
		5	Computer Network + Lab	1
		5	Mobile Programming	1
		1	Logic Circuits	1
			TOTAL	**5**
16	Dr. Indar Chaerah, ST., MT.	7	Control System of Power Engineering	1
		5	Control and Stability of Electrical Power System	1
		5	Electrical Measurement	1
		3	Basic of Power Engineering	1
		3	Basic of Power Engineering Lab	0.2
		5	Analysis of Electrical Power System	1
		3	Engineering Physics	1
			TOTAL	**6.2**
17	Ardiaty Arief, ST., MTM., PhD.	5	Alternating Current Transmission	1
		5	Analysis of Electrical Power System	1
		5	Control and Stability of Electrical Power System	1
			TOTAL	**3**
18	Dr. Ir. Zahir Zainuddin, M.Sc.			
		5	Operational Amplifier Circuit	1
		5	Electronics Instrumentation System + Lab	1.5
		1	Engineering Drawing	1
		5	Microprocessor based System + Lab	1.5
			TOTAL	**5**
19	Dr. A. Ejah Umraeni Salam, ST., MT.	1	Logic Circuits	2
		5	Control System + Lab	1.5
		3	Basic of Electronics	1
		5	Electronics Instrumentation System + Lab	1.5
		5	Electromagnetics Field	1
		3	Basic of Electronics Lab	0.2
			TOTAL	**5.7**
20	Prof. Dr. Ir. Nadjamuddin Harun, MS.	7	New and Renewable Energy Sources	2
		5	Electrical Power Generation	1
			TOTAL	**3**
21	Dr.-Ing. Faizal Arya Samman, ST., MT.	5	Digital System Design + Lab	1.5
		3	Basic of Electronics	1
		3	Basic of Electronics	1
		5	System on a Chip	1
		5	Integrated Circuits Technology	1
		3	Basic of Electronics Lab	0.2
			TOTAL	**5.7**
22	Merna Baharuddin, ST., M.Tel.Eng., PhD.	5	Antenna and Propagation + Lab	1.5
		7	Special Topics on Telecommunication Networks	1
		3	Basic of Telecommunication	2
		3	Basic of Telecommunication Lab	0.2

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		5	Telecommunication Transmission Line	1
		5	Access Network Technology	1
		5	Transmission System and High Frequency Lab	1.5
			TOTAL	**8.2**
23	Muhammad Bachtiar Nappu, St., MT.M.Phil., PhD.	7	Electricity Market	2
		7	Electricity Load Projection	2
		3	Engineering Physics	1
		5	Electrical Measurement	1
			TOTAL	**6**
24	Hasniati, ST., MT	1	Engineering Chemical	1
		1	Electric Circuits 1	1.5
		3	Engineering Physics	1.5
			TOTAL	**4**
25	Ida Rachmaniar Sahali, ST., MT.	5	Computer Architecture 1 + Lab	1.5
		5	Computer Network + Lab	1
		5	Data Communication	1
		5	Industrial Automation + Lab	1
			TOTAL	**4.5**
26	Dr. Ikhlas Kitta, ST., MT.	5	Alternating Current Transmission	1
		3	Electrical Materials	1
		3	Basic of Power Engineering	1
		3	Basic of Power Engineering Lab	0.2
		3	Electrical Materials	1
			TOTAL	**4.2**
27	Dr. Indrabayu, St., MT. M.Bus.Sys.	7	Special Topics on Wireless	1
		5	Engineering Economy	2
		7	Artificial Intelligent System	1
			TOTAL	**4**
28	Ir. Gassing, MT.	7	Substation and Equipment of Electrical Power System	2
		1	Engineering Chemical	2
		3	Basic of Power System	1
		3	Basic of Power System Lab	0.2
		5	Electrical Machinery 1 + Lab	1
		5	Computer Network Based Scada	1
			TOTAL	**7.2**
29	Andini Dani Achmad, ST., MT.	7	Telecommunication Transmission Network	1
		1	Logic Circuits	1
		3	Basic of Telecommunication	1
		3	Basic of Telecommunication Lab	0.2
		3	Engineering Match 1	1.5
		5	Access Network Technology	1
		5	Switching Technology + Lab	1
			TOTAL	**6.7**
30	Prof. Ir. Ansar Suyuti, MT.	5	Electrical Measurement	1
		5	Engineering Economy	1
		7	Electric Motor Applications	1
		5	Engineering Economy	2
			TOTAL	**6**
31	Prof. Dr. Ir. Salama Manjang, MT.	3	Electrical Materials	1
		3	Electrical Materials	1
		5	Electromagnetics Field	1
		7	Research Methodology and Scientific Writing	1
		7	Research Methodology and Scientific Writing	1
			TOTAL	**5**
32	Dr.Eng. Yusri Syam Akil, ST., MT.	5	Electrical Measurement	1

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		5	Electrical Measurement	1
		3	Basic of Power System	1
		3	Basic of Power System Lab	0.2
		5	Electric Machinery Analysis 1 + Lab	1
		7	Electric Motor Applications	1
		7	Energy Management	2
			TOTAL	**7.2**
33	Muh. Anshar, ST., M.Sc.	5	Industrial Robotics	1
		5	Microprocessor based System + Lab	1.5
		1	Engineering Drawing	1
		1	Engineering Drawing	1
		1	Basic of Electronics	1
		3	Basic of Electronics + Lab	0.2
			TOTAL	**5.7**
34	Dr. Ir. Ingrid Nurtanio, MT.	3	Engineering Math 1	1.5
			TOTAL	**1.5**
35	Ir. Christoforus, MT.	5	Industrial Robotics	1
		7	Industrial Automation + Lab	1
		3	Engineering Chemical	1
		5	Computer Network Based Scada	1
			TOTAL	**4**
36	Prof. Dr.Eng. Syafaruddin, ST., M.Eng.	5	Energy Storage System	2
		7	Smart System of Power Engineering	2
		7	Electric Circuits 1	1.5
		7	Research Methodology and Scientific Writing	1
			Research Methodology and Scientific Writing	1
			TOTAL	**7.5**
	Andreas	7	Digital System Design + Lab	1.5
		7	System on a Chip	1
		7	Integrated Circuit Technology	1
			TOTAL	**3.5**
	Azran Budi Arief, ST, M.T	3	Engineering Math	1.5
		1	Engineering Drawing	1
		3	Electromagnetics Field	1
		3	Engineering Chemical	1
			TOTAL	**4.5**
	Ir. Samuel Panggalo, MT	1	Engineering Drawing	1
			Basic of Telecommunication	1
			Basic of Telecommunication Lab	0.5
			TOTAL	**2.5**
	Dr.Ir. Yustinus Upa, MT.	1	Engineering Drawing	1

Gowa, 26th of June 2019
Head of Electrical Department

Signed
Prof. Dr. Ir. Salama Manjang, M.T.
NIP. 19621231 199003 1 024

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Nomor : **9594/UN4.7.7/PL.00.03/2019**
Lampiran : -
Hal : **Undangan Rapat**

Yth. : Bapak/Ibu Dosen DepartemenTeknik Elektro
Di -
M a k a s s a r

Sehubungan dengan akan dimulainya perkuliahan semester awal 2019/2020 maka kami mengundang Bapak/Ibu Dosen untuk menghadiri rapat, yang Insya Allah akan dilaksanakan pada:

Hari / Tanggal : Rabu, 26 Juni 2019
W a k t u : Pukul 10.00 Wita s.d selesai
T e m p a t : Ruang Rapat Departemen Teknik Elektro
A g e n d a : - Evaluasi Pembelajaran Semester Akhir 2018/2019
- Persiapan Pembelajaran Semester Awal 2019/2020
- dll yang dianggap perlu

Mengingat pentingnya kegiatan ini partisipasi Bapak/Ibu dalam mengikuti rapat ini sangat diharapkan tepat pada waktunya, atas perhatian dan partisipasinya disampaikan terima kasih.

Gowa, 19 Juni 2019
Ketua Departemen Teknik Elektro,

Prof. Dr. Ir. Salama Manjang, M.T.
NIP. 19621231 199003 1 024

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NOTULENSI RAPAT

Hari/Tanggal : Rabu, 26 Juni 2019
Waktu : 10.00 – selesai (WITA)
Tempat : Ruang Rapat Departemen Teknik Elektro
Agenda : 1. Evaluasi pembelajaran semester akhir 2018/2019
2. Persiapan pembelajaran semester awal 2019/2020

Evaluasi Pembelajaran Semester Akhir 2018/2019

Indeks Capaian Pembelajaran Lulusan

CP 1	CP 2	CP 3	CP 4	CP 5	CP 6	CP 7
2.89	2.59	2.96	3.29	3.14	3.21	3.10

Berikut, daftar mata kuliah dengan nilai Indikator Kinerja kurang dari 2.75.

No	Mata kuliah	Nilai IK
1	Rangkaian Listrik 2	2.60
2	Sistem Digital	2.04
3	Sistem Linier	2.10
4	Pemograman Komputer	2,65
5	Elektronika Terintegrasi	2.09
6	Sistem Mikroprosessor dan Antarmuka	2.70
7	Dasar Sistem Kendali	2.33
8	Instalasi Listrik + Praktikum	2.36
9	Komunikasi Seluler	2.51

Tim dosen terkhusus untuk mata kuliah dengan indikator kinerja kurang agar melakukan rapat analisis masalah dan perbaikan yang didokumentasikan dan disetor ke Unit Penjaminan Mutu (*Dr. A. Ejah Umraeni Salam, S.T., M.T.*).
Diharapkan nilai Indikator Kinerja mata kuliah ini dapat meningkat pada semester berikutnya dan mata kuliah lainnya untuk dipertahankan dan ditingkatkan.

Persiapan Pembelajaran Semester Awal 2019/2020

Daftar Mata Kuliah dan Dosen Semester Awal 2019/2020

NO	NAMA	SMS	MATA KULIAH	SKS
1	PROF. DR. IR. H. MUH. TOLA, M.ENG.	7	Opto Elektronik	2
		3	Fisika Teknik	1
		5	Iluminasi	2
			TOTAL	**5**
2	Dr. Ir. Sri Mawar Said, MT.	1	Rangkaian Listrik 1	3
		3	Dasar Tenaga Listrik	1

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		3	Dasar Tenaga Listrik	1
		3	Praktikum Dasar Tenaga Listrik	1
		5	Sistem Proteksi 1	2
			TOTAL	**8**
3	Ir. Zaenab Muslimin	1	Rangkaian Listrik 1	3
		5	Probabilitas dan Statistik	2
			TOTAL	**5**
4	Dr. Yusran, ST., MT.	3	Fisika Teknik	1
		5	Pengukuran Listrik	1
			Pembangkit Tenaga Listrik	1
		1	Kimia Teknik	1
			TOTAL	**4**
5	Dr. Ir. Rhiza S. Sadjad, MSEE	5	Sistem Kendali + Praktikum	1.5
		5	Teknologi Kendali Proses	1
		5	Rangkaian Penguat Operasional	1
			TOTAL	**3.5**
6	Dr. Ir. Andani Ahmad, MT	1	Rangkaian Logika	1
		3	Dasar Elektronika	1
		5	Teknologi Kendali Proses	1
		5	Divais Mikroelektronika	2
		5	Probabilitas dan Statistik	1
		5	Probabilitas dan Statistik	1
		5	Komunikasi Serat Optik	1
		3	Praktikum Dasar Elektronika	0.5
			TOTAL	**8**
7	Dr. Adnan, ST., MT	1		
		5	Arsitektur Komputer 1 + Praktikum	1.5
			TOTAL	**1.5**
8	Dr.Eng. Wardi, ST., M.Eng.	7	Topik Khusus Jaringan Telekomunikasi	1
		1	Rangkaian Logika	1
		3	Dasar Elektronika	1
		3	Dasar Telekomunikasi	1
		5	Komunikasi Data	1
		3	Praktikum Dasar Elektronika	0.5

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		7	Topik Khusus Wireless	1
		3	Praktikum Dasar Telekomunikasi	0.5
			TOTAL	**7**
9	Dr.Eng. Elyas, ST., M.Eng.	5	Medan Elektromagnetik	2
		5	Medan Elektromagnetik	1
		5	Antena dan Propagasi + Praktikum	1.5
		5	Sistem Transmisi dan Frek. Tinggi + Prak.	1.5
		5	Mobile Programming	1
			TOTAL	**7**
10	Dr. Ir. SyafruddinSyarif, MT.	7	Perancangan Jaringan Teresterial	1
		5	Sistem Saluran Komunikasi Tenaga Listrik	1
		5	Komunikasi Digital	1
		7	Metode Penelitian dan Penulisan Ilmiah	1
		7	Perangkat Lunak Telekomunikasi	2
			TOTAL	**6**
11	Dr. Ir. Zulfajri B., M.Eng.	5	Perancangan Jaringan Teresterial	1
		5	Probabilitas dan Statistik	1
		5	Komunikasi Satelit	2
		7	Sistem Informasi Telekomunikasi	2
			TOTAL	**6**
12	Dr.Eng. Ir. Dewiani, MT	5	Jaringan Telekomunikasi Telepon	1
		5	Probabilitas dan Statistik	1
		3	Dasar Telekomunikasi	1
		3	Matematika Teknik 1	1.5
		5	Teknologi *Switching* + PRAKTIKUM	1
		5	Komunikasi Serat Optik	1
		7	Metode Penelitian dan Penulisan Ilmiah	1
		3	Praktikum Dasar Telekomunikasi	0.5
			TOTAL	**8**
13	Dr.Eng. Intan Sari Areni, MT.	5	Jaringan Telekomunikasi Telepon	1
		5	Sistem Saluran Komunikasi Tenaga Listrik	1
		3	Dasar Telekomunikasi	1
		3	Matematika Teknik 1	1.5

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		3	Matematika Teknik 1	1.5
		5	Komunikasi Digital	1
		3	Praktikum Dasar Telekomunikasi	0.5
			TOTAL	**7.5**
14	Amil Ahmad Ilham, ST., MIT., PhD	5	Web Programming	1
		5	Cloud Computing	1
			TOTAL	**3.5**
15	Dr.Eng. Muh. Niswar, ST., M.Info.Tech.	5	Web Programming	1
		5	Cloud Computing	1
		5	Jaringan Komputer + Praktikum	1
		5	Mobile Programming	1
		1	Rangkaian Logika	1
			TOTAL	**5**
16	Dr. Indar Chaerah, ST., MT.	7	Teknik Kendali Sistem Tenaga Listrik	1
		5	Kendali dan Kestabilian STL	1
		5	Pengukuran Listrik	1
		3	Dasar Tenaga Listrik	1
		3	Praktikum Dasar Tenaga Listrik	0.5
		5	Analisis STL	1
		3	Fisika Teknik	1
			TOTAL	**6.5**
17	Ardiaty Arief, ST., MTM., PhD.	5	Transmisi Arus Bolak Balik	1
		5	Analisis STL	1
		5	Kendali dan Kestabilan STL	1
			TOTAL	**3**
18	Dr. Ir. Zahir Zainuddin, M.Sc.			
		5	Rangkaian Penguat Operasional	1
		5	Sistem Instrumentasi Elektronika + Prak.	1.5
		1	Menggambar Teknik	1
		5	Sistem Berbasis Mikroprocesor + Praktikum	1.5
			TOTAL	**5**
19	Dr. A. Ejah Umraeni Salam, ST., MT.	1	Rangkaian Logika	2

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		5	Sistem Kendali + Praktikum	1.5
		3	Dasar Elektronika	1
		5	Sistem Instrumentasi Elektronika + Prak.	1.5
		5	Medan Elektromagnetik	1
		3	Praktikum Dasar Elektronika	0.5
			TOTAL	**7.5**
20	Prof. Dr. Ir. Nadjamuddin Harun, MS.	7	Sumber Energi Baru Terbarukan	2
		5	Pembangkit Tenaga Listrik	1
			TOTAL	**3**
21	Dr.-Ing. Faizal Arya Samman, ST., MT.	5	Perancangan Sistem Digital + Praktikum	1.5
		3	Dasar Elektronika	1
		3	Dasar Elektronika	1
		5	Sistem dalam sebuah chip	1
		5	Teknologi Rangkaian Terintegrasi	1
		3	Praktikum Dasar Elektronika	1
			TOTAL	**6.5**
22	Merna Baharuddin, ST., M.Tel.Eng., PhD.	5	Antena dan Propagasi + Praktikum	1.5
		7	Topik Khusus Jaringan Telekomunikasi	1
		3	Dasar Telekomunikasi	1
		3	Praktikum Dasar Telekomunikasi	0.5
		5	Saluran Transmisi Telekomunikasi	1
		5	Teknologi Jaringan Akses	1
		5	Sistem Transmisi dan Frek. Tinggi Prak.	1.5
			TOTAL	**7.5**
23	Muhammad Bachtiar Nappu, St., MT.M.Phil., PhD.	7	Pasar Ketenagalistrikan	2
		7	Perkiraan Beban Listrik	2
		3	Fisika Teknik	1
		5	Pengukuran Listrik	1
			TOTAL	**6**
24	Hasniati, ST., MT	1	Kimia Teknik	1
		1	Rangkaian Listrik 1	1.5
		3	Fisika Teknik	1.5
			TOTAL	**4**

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25	Ida Rachmaniar Sahali, ST., MT.	5	Arsitektur Komputer 1 + Praktikum	1.5
		5	Jaringan Komputer + Praktikum	1
		5	Komunikasi Data	1
		5	Otomasi Industri + Praktikum	1
			TOTAL	**4.5**
26	Dr. Ikhlas Kitta, ST., MT.	5	Transmisi Arus Bolak Balik	1
		3	Material Elektro Teknik	1
		3	Dasar Tenaga Listrik	1
		3	Praktikum Dasar Tenaga Listrik	0.5
		3	Material Elektro Teknik	1
			TOTAL	**4.5**
27	Dr. Indrabayu, St., MT. M.Bus.Sys.	7	Topik Khusus Wireless	1
		5	Ekonomi Teknik	2
		7	Sistem Kecerdasan Buatan	1
			TOTAL	**4**
28	Ir. Gassing, MT.	7	Gardu Induk dan Peralatan STL	2
		1	Kimia Teknik	2
		3	Dasar Tenaga Listrik	1
		3	Praktikum Dasar Tenaga Listrik	0.17
		5	Analisis Mesin Listrik 1 + Praktikum	1
		5	Scada Berbasis Jaringan Komputer	1
			TOTAL	**7.17**
29	Andini Dani Achmad, ST., MT.	7	Saluran Transmisi Telekomunikasi	1
		1	Rangkaian Logika	1
		3	Dasar Telekomunikasi	1
		3	Praktikum Dasar Telekomunikasi	0.5
		3	Matematika teknik 1	1.5
		5	Teknologi Jaringan Akses	1
		5	Teknologi *Switching* + PRAKTIKUM	1
			TOTAL	**7**
30	Prof. Ir. Ansar Suyuti, MT.	5	Pengukuran Listrik	1
		5	Ekonomi Teknik	2
		7	Penggunaan Motor Listrik	1

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		5	Ekonomi Teknik	2
			TOTAL	**6**
31	Prof. Dr. Ir. Salama Manjang, MT.	3	Material Elektro Teknik	1
		3	Material Elektro Teknik	1
		5	Medan Elektromagnetik	1
		7	Metode Penelitian dan Penulisan Ilmiah	1
		7	Metode Penelitian dan Penulisan Ilmiah	1
			TOTAL	**5**
32	Dr.Eng. Yusri Syam Akil, ST., MT.	5	Pengukuran Listrik	1
		5	Pengukuran Listrik	1
		3	Dasar Tenaga Listrik	1
		3	Praktikum Dasar Tenaga Listrik	0.5
		5	Analisis Mesin Listrik 1 + Praktikum	1
		7	Penggunaan Motor Listrik	1
		7	Manajemen Energi	2
			TOTAL	**7.5**
33	Muh. Anshar, ST., M.Sc.	5	Robotika Industri	1
		5	Sistem Berbasis Mikroprocesor + Praktikum	1.5
		1	Menggambar Teknik	1
		1	Menggambar Teknik	1
		1	Dasar Elektronika	1
		3	Praktikum Dasar Elektronika	0.5
			TOTAL	**6**
34	Dr. Ir. Ingrid Nurtanio, MT.	3	Matematika Teknik 1	1.5
			TOTAL	**1.5**
35	Ir. Christoforus, MT.	5	Robotika Industri	1
		7	Otomasi Industri + Praktikum	1
		3	Kimia Teknik	1
		5	Scada Berbasis Jaringan Komputer	1
			TOTAL	**4**
36	Prof. Dr.Eng. Syafaruddin, ST., M.Eng.	5		
		7	Sistem Penyimpanan Energi	2

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	7	Sistem Cerdas Tenaga Listrik	2
		Rangkaian Listrik 1	1.5
	7	Metode Penelitian dan Penulisan Ilmiah	1
	7	Metode Penelitian dan Penulisan Ilmiah	1
		TOTAL	**7.5**
Andreas	7	Perancangan Sistem Digital + Praktikum	1.5
	7	Sistem dalam sebuah chip	1
	7	Teknologi Rangkaian Terintegrasi	1
		TOTAL	**3.5**
Azran Budi Arief, ST, M.T	3	Matematika Teknik	1.5
	1	Menggambar Teknik	1
	3	Medan Elektromagnetik	1
	3	Kimia Teknik	1
		TOTAL	**4.5**
Ir. Samuel Panggalo, MT	1	Menggambar Teknik	1
		Dasar Telekomunikasi	1
		Praktikum Dasar Telekomunikasi	0.5
		TOTAL	**2.5**
Dr.Ir. Yustinus Upa, MT.	1	Menggambar Teknik	1

Gowa, 26 Juni 2019
Ketua Departemen Teknik Elektro

Prof. Dr. Ir. Salama Manjang, M.T.
NIP. 196212311199003 1 024

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MEETING NOTES

Date and Time : Wednesday, 26th of June 2019
10.00 WITA - End
Place : Meeting Room, Department of Electrical Engineering
Topics : 1. Teaching Evaluation of 2018/2019 Last Semester
2. Teaching Preparation of 2019/202 First Semester

Teaching Evaluation of 2018/2019 Last Semester

Index of Student Outcome Target (SO)

SO 1	SO 2	SO 3	SO 4	SO 5	SO 6	SO 7
2.89	2.59	2.96	3.29	3.14	3.21	3.10

List of courses with performance indicator (PI) value less than 2.75

No	Course	IK Value
1	Electric Circuits 2	2.60
2	Digital Systems	2.04
3	Linear Systems	2.10
4	Computer Programming	2,65
5	Integrated Electronics	2.09
6	Microprocessor Systems and Interfaces	2.70
7	Basic Control Systems	2.33
8	Electric Installation + Laboratory	2.36
9	Cellular Communication	2.51

Teaching team of courses with low performance indicator (PI) value will conduct the meeting to analysis the possible problems and its solutions. The meeting will be documented and given to quality assurance unit (*Dr. A. Ejah Umraeni Salam, S.T., M.T.*).
Performance indicator value of the listed courses is expected to increase in the next semester and other courses with proper IK Value are sustained and improved.

Teaching Preparation of 2019/2020 First Semester

List of Courses and Lecturers for First Semester of 2019/2020

NO	NAME	SMS	COURSE	CREDIT
1	PROF. DR. IR. H. MUH. TOLA, M.ENG.	7	Opto Electronics	2
		3	Engineering Physics	1
		5	Illumination	2
			TOTAL	**5**
2	Dr. Ir. Sri Mawar Said, MT.	1	Electric Circuit 1	3
		3	Basic of Power Engineering	1
		3	Basic of Power Engineering	1
		3	Basic of Power Engineering Lab	1
		5	Protection System 1	2
			TOTAL	**8**
3	Ir. Zaenab Muslimin	1	Electric Circuit 1	3

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		5	Probability and Statistics	2
			TOTAL	**5**
4	Dr. Yusran, ST., MT.	3	Engineering Physics	1
		5	Electrical Measurement	1
			Power Electrical Generation	1
		1	Engineering Chemical	1
			TOTAL	**4**
5	Dr. Ir. Rhiza S. Sadjad, MSEE	5	Control System and Lab	1.5
		5	Process Control Technology	1
		5	Operational Amplifier Circuit	1
			TOTAL	**3.5**
6	Dr. Ir. Andani Ahmad, MT	1	Logic Circuit	1
		3	Basic of Electronics	1
		5	Process Control Technology	1
		5	Microelectronics Device	2
		5	Probability and Statistics	1
		5	Probability and Statistics	1
		5	Fiber Optics Communication	1
		3	Basic Electronics Lab	0.5
			TOTAL	**8**
7	Dr. Adnan, ST., MT	1		
		5	Computer Architecture 1 + Lab	1.5
			TOTAL	**1.5**
8	Dr.Eng. Wardi, ST., M.Eng.	7	Special Topics on Telecommunication Network	1
		1	Logic Circuits	1
		3	Basic of Electronics	1
		3	Basic of Telecommunication	1
		5	Data Communication	1
		3	Basic Electronics Lab	0.5
		7	Special Topic on Wireless	1
		3	Basic of Telecommunication Lab	0.5
			TOTAL	**7**
9	Dr.Eng. Elyas, ST., M.Eng.	5	Electromagnetics Field	2
		5	Electromagnetics Field	1
		5	Antenna and Propagation _ Lab	1.5
		5	Transmission System and High Frequency + Lab	1.5
		5	Mobile Programming	1
			TOTAL	**7**
10	Dr. Ir. SyafruddinSyarif, MT.	7	Terrestrial Network Planning	1
		5	Power Electrical Communication Network System	1
		5	Digital Communication	1
		7	Research Methodology and Scientific Writing	1
		7	Telecommunication Software	2
			TOTAL	**6**
11	Dr. Ir. Zulfajri B., M.Eng.	5	Terrestrial Network Planning	1
		5	Probability and Statistics	1
		5	Satellite Communication	2
		7	Telecommunication Information System	2
			TOTAL	**6**
12	Dr.Eng. Ir. Dewiani, MT	5	Telecommunication Network	1
		5	Probability and Statistics	1
		3	Basic of Telecommunication	1
		3	Engineering Math 1	1.5
		5	Switching Technology + Lab	1
		5	Fiber Optics Communication	1

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		7	Research Methodology and Scientific Writing	1
		3	Basic Telecommunication Lab	0.5
			TOTAL	**8**
13	Dr.Eng. Intan Sari Areni, MT.	5	Telecommunication Networks	1
		5	Power Electrical Communication Network System	1
		3	Basic Telecommunication	1
		3	Engineering Math 1	1.5
		3	Engineering Math 1	1.5
		5	Digital Communication	1
		3	Basic Telecommunication Lab	0.5
			TOTAL	**7.5**
14	Amil Ahmad Ilham, ST., MIT., PhD	5	Web Programming	1
		5	Cloud Computing	1
			TOTAL	**3.5**
15	Dr.Eng. Muh. Niswar, ST., M.Info.Tech.	5	Web Programming	1
		5	Cloud Computing	1
		5	Computer Network + Lab	1
		5	Mobile Programming	1
		1	Logic Circuits	1
			TOTAL	**5**
16	Dr. Indar Chaerah, ST., MT.	7	Control System of Power Engineering	1
		5	Control and Stability of Electrical Power System	1
		5	Electrical Measurement	1
		3	Basic of Power Engineering	1
		3	Basic of Power Engineering Lab	0.5
		5	Analysis of Electrical Power System	1
		3	Engineering Physics	1
			TOTAL	**6.5**
17	Ardiaty Arief, ST., MTM., PhD.	5	Alternating Current Transmission	1
		5	Analysis of Electrical Power System	1
		5	Control and Stability of Electrical Power System	1
			TOTAL	**3**
18	Dr. Ir. Zahir Zainuddin, M.Sc.			
		5	Operational Amplifier Circuit	1
		5	Electronics Instrumentation System + Lab	1.5
		1	Engineering Drawing	1
		5	Microprocessor based System + Lab	1.5
			TOTAL	**5**
19	Dr. A. Ejah Umraeni Salam, ST., MT.	1	Logic Circuits	2
		5	Control System + Lab	1.5
		3	Basic of Electronics	1
		5	Electronics Instrumentation System + Lab	1.5
		5	Electromagnetics Field	1
		3	Basic of Electronics Lab	0.5
			TOTAL	**7.5**
20	Prof. Dr. Ir. Nadjamuddin Harun, MS.	7	New and Renewable Energy Sources	2
		5	Electrical Power Generation	1
			TOTAL	**3**
21	Dr.-Ing. Faizal Arya Samman, ST., MT.	5	Digital System Design + Lab	1.5
		3	Basic of Electronics	1
		3	Basic of Electronics	1
		5	System on a Chip	1
		5	Integrated Circuits Technology	1
		3	Basic of Electronics Lab	1

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			TOTAL	**6.5**
22	Merna Baharuddin, ST., M.Tel.Eng., PhD.	5	Antenna and Propagation + Lab	1.5
		7	Special Topics on Telecommunication Networks	1
		3	Basic of Telecommunication	1
		3	Basic of Telecommunication Lab	0.5
		5	Telecommunication Transmission Line	1
		5	Access Network Technology	1
		5	Transmission System and High Frequency Lab	1.5
			TOTAL	**7.5**
23	Muhammad Bachtiar Nappu, St., MT.M.Phil., PhD.	7	Electricity Market	2
		7	Electricity Load Projection	2
		3	Engineering Physics	1
		5	Electrical Measurement	1
			TOTAL	**6**
24	Hasniati, ST., MT	1	Engineering Chemical	1
		1	Electric Circuits 1	1.5
		3	Engineering Physics	1.5
			TOTAL	**4**
25	Ida Rachmaniar Sahali, ST., MT.	5	Computer Architecture 1 + Lab	1.5
		5	Computer Network + Lab	1
		5	Data Communication	1
		5	Industrial Automation + Lab	1
			TOTAL	**4.5**
26	Dr. Ikhlas Kitta, ST., MT.	5	Alternating Current Transmission	1
		3	Electrical Materials	1
		3	Basic of Power Engineering	1
		3	Basic of Power Engineering Lab	0.5
		3	Electrical Materials	1
			TOTAL	**4.5**
27	Dr. Indrabayu, St., MT. M.Bus.Sys.	7	Special Topics on Wireless	1
		5	Engineering Economy	2
		7	Artificial Intelligent System	1
			TOTAL	**4**
28	Ir. Gassing, MT.	7	Substation and Equipment of Electrical Power System	2
		1	Engineering Chemical	2
		3	Basic of Power System	1
		3	Basic of Power System Lab	0.17
		5	Electrical Machinery 1 + Lab	1
		5	Computer Network Based Scada	1
			TOTAL	**7.17**
29	Andini Dani Achmad, ST., MT.	7	Telecommunication Transmission Network	1
		1	Logic Circuits	1
		3	Basic of Telecommunication	1
		3	Basic of Telecommunication Lab	0.5
		3	Engineering Match 1	1.5
		5	Access Network Technology	1
		5	Switching Technology + Lab	1
			TOTAL	**7**
30	Prof. Ir. Ansar Suyuti, MT.	5	Electrical Measurement	1
		5	Engineering Economy	2
		7	Electric Motor Applications	1
		5	Engineering Economy	2
			TOTAL	**6**
31	Prof. Dr. Ir. Salama Manjang, MT.	3	Electrical Materials	1

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		3	Electrical Materials	1
		5	Electromagnetics Field	1
		7	Research Methodology and Scientific Writing	1
		7	Research Methodology and Scientific Writing	1
			TOTAL	**5**
32	Dr.Eng. Yusri Syam Akil, ST., MT.	5	Electrical Measurement	1
		5	Electrical Measurement	1
		3	Basic of Power System	1
		3	Basic of Power System Lab	0.5
		5	Electric Machinery Analysis 1 + Lab	1
		7	Electric Motor Applications	1
		7	Energy Management	2
			TOTAL	**7.5**
33	Muh. Anshar, ST., M.Sc.	5	Industrial Robotics	1
		5	Microprocessor based System + Lab	1.5
		1	Engineering Drawing	1
		1	Engineering Drawing	1
		1	Basic of Electronics	1
		3	Basic of Electronics + Lab	0.5
			TOTAL	**6**
34	Dr. Ir. Ingrid Nurtanio, MT.	3	Engineering Math 1	1.5
			TOTAL	**1.5**
35	Ir. Christoforus, MT.	5	Industrial Robotics	1
		7	Industrial Automation + Lab	1
		3	Engineering Chemical	1
		5	Computer Network Based Scada	1
			TOTAL	**4**
36	Prof. Dr.Eng. Syafaruddin, ST., M.Eng.	5	Energy Storage System	2
		7	Smart System of Power Engineering	2
		7	Electric Circuits 1	1.5
		7	Research Methodology and Scientific Writing	1
			Research Methodology and Scientific Writing	1
			TOTAL	**7.5**
	Andreas	7	Digital System Design + Lab	1.5
		7	System on a Chip	1
		7	Integrated Circuit Technology	1
			TOTAL	**3.5**
	Azran Budi Arief, ST, M.T	3	Engineering Math	1.5
		1	Engineering Drawing	1
		3	Electromagnetics Field	1
		3	Engineering Chemical	1
			TOTAL	**4.5**
	Ir. Samuel Panggalo, MT	1	Engineering Drawing	1
			Basic of Telecommunication	1
			Basic of Telecommunication Lab	0.5
			TOTAL	**2.5**
	Dr.Ir. Yustinus Upa, MT.	1	Engineering Drawing	1

Gowa, 26th of June 2019
Head of Electrical Department

Signed
Prof. Dr. Ir. Salama Manjang, M.T.
NIP. 19621231 199003 1 024

KEMENTERIAN PENDIDIKAN, KEBUDAYAAN, RISET DAN TEKNOLOGI
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Nomor : **682/UN4.7.7/KR.00.01/2021**
Lampiran : -
Hal : **Undangan Rapat**

Yth. : Bapak/Ibu Dosen DepartemenTeknik Elektro
Di -
M a k a s s a r

Sehubungan dengan akan dimulainya perkuliahan semester akhir 2020/2021 maka kami mengundang Bapak/Ibu Dosen untuk menghadiri rapat, yang Insya Allah akan dilaksanakan pada:

Hari / Tanggal	:	Rabu, 27 Januari 2021
W a k t u	:	Pukul 10.00 Wita s.d selesai
T e m p a t	:	Ruang Rapat Departemen Teknik Elektro
A g e n d a	:	- Evaluasi Pembelajaran Semester Awal 2020/2021
		- Persiapan Pembelajaran Semester Akhir 2020/2021
		- dll yang dianggap perlu

Mengingat pentingnya kegiatan ini partisipasi Bapak/Ibu dalam mengikuti rapat ini sangat diharapkan tepat pada waktunya, atas perhatian dan partisipasinya disampaikan terima kasih.

Gowa, 20 Januari 2021
Ketua Departemen Teknik Elektro
Fakultas Teknik Unhas

Dr. Eng. Ir. Dewiani, M.T.
NIP. 19691026 199412 2 001

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NOTULENSI RAPAT

Hari/Tanggal : Rabu, 27 Januari 2021
Waktu : 10.00 – selesai (WITA)
Tempat : Ruang Rapat Departemen Teknik Elektro
Agenda : 1. Evaluasi pembelajaran semester awal 2020/2021
2. Persiapan pembelajaran semester akhir 2020/2021

Evaluasi Pembelajaran Semester Awal 2020/2021

Indeks Capaian Pembelajaran Lulusan

CP 1	CP 2	CP 3	CP 4	CP 5	CP 6	CP 7
3.29	3.43	3.33	3.71	3.59	3.50	2.90

Berikut, daftar mata kuliah dengan nilai Indikator Kinerja kurang dari 2.75.

No	Mata kuliah	Nilai IK
1	Probabilitas dan Statistik	2.60
2	Transmisi Arus Bolak Balik	2.55
3	Analisis Sistem Tenaga Listrik	0.64
4	Otomasi Industri + Praktikum	2.65

Tim dosen terkhusus untuk mata kuliah dengan indikator kinerja kurang agar melakukan rapat analisis masalah dan perbaikan yang didokumentasikan dan disetor ke Unit Penjaminan Mutu (*Dr. A. Ejah Umraeni Salam, S.T., M.T.*).
Diharapkan nilai Indikator Kinerja mata kuliah ini dapat meningkat pada semester berikutnya dan mata kuliah lainnya untuk dipertahankan dan ditingkatkan.

Persiapan Pembelajaran Semester Akhir 2020/2021

Daftar Mata Kuliah dan Dosen Semester Akhir 2020/2021

NO	NAMA	SMS	MATA KULIAH	SKS
1	**Prof. Dr. Ir. Syafruddin Syarif, MT.**	vi	Teori Informasi dan Pengkodean	2
		vi	Pengolahan Isyarat Digital	1
		vi	Teknologi Nirkabel	1
		vi	Pengolahan Citra	1
		ii	Sistem digital	1
		vi	Kinerja Sistem Telekomunikasi	1
			TOTAL	**7**
2	**Prof. Dr. Ir. Ansar Suyuti, MT.**	vi	Algoritma dan Struktur Data	1
		iv	Mesin-Mesin Listrik	1
		iv	Instalasi Listrik + Praktikum	1
		vi	Manajemen dan Kewirausahaan	1
		vi	Manajemen dan Kewirausahaan	2
			TOTAL	**6**
3	**Prof. Dr. Ir. Andani Ahmad, MT**	vi	Perancangan Sistem Kendali	1
		vi	Spread Spektrum	1

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		vi	Rekayasa Trafik	1
		iv	Elektronika Terintegrasi	1
		iv	Praktikum Sistem Mikroprosessor dan Antarmuka	0.5
		iv	Praktikum Sistem Mikroprosessor dan Antarmuka	0.5
		iv	Praktikum Sistem Mikroprosessor dan Antarmuka	0.5
		ii	Sistem Digital	1
			TOTAL	**6.5**
4	**Prof. Dr.-Ing. Faizal Arya Samman, ST., MT.**			
		iv	Praktikum Elektronika Terintegrasi	0.5
		iv	Praktikum Elektronika Terintegrasi	0.5
		iv	Praktikum Elektronika Terintegrasi	0.5
		ii	Sistem Digital	1
		ii	Praktikum Sistem Digital	0.5
		ii	Praktikum Sistem Digital	0.5
		ii	Praktikum Sistem Digital	0.5
		ii	Praktikum Sistem Digital	0.5
		vi	Perancangan Sistem Tersemat + Praktikum	1
		vi	Elektronika Daya + Praktikum	1
		iv	Elektronika Terintegrasi	1
		iv	Elektronika Terintegrasi	1
		iv	Elektronika Terintegrasi	1
			TOTAL	**9.5**
5	**Prof. Dr. Ir. Salama Manjang, MT.**	vi	Teknik Tegangan Tinggi + Praktikum	1
		ii	Praktikum Rangkaian Listrik	0.5
		vi-vii	Sumber Energi Baru Terbarukan	1
		vi	Konversi Energi	1
		vi	Distribusi Tenaga Listrik + Praktikum	1
			TOTAL	**4.5**
6	**Prof. Dr.Eng. Syafaruddin, ST., M.Eng.**	vi	Konversi Energi	1
		vi-viii	Sumber Energi Baru Terbarukan	1
		ii	Rangkaian ListrikII	1.5
		ii	Praktikum Rangkaian Listrik II	0.5
		vi	Metode Numerik	1
			TOTAL	**5**
7	**Dr. Ir. Yustinus, MT**			
		vi - viii	Opto Elektronika	**1**
		iv	Dasar Sistem Kendali	**1**
		ii	Pemograman Komputer	**1**
		ii	Pemograman Komputer	**1**
		iv	Instalasi Listrik + Praktikum	1
		ii	Praktikum Rangkaian Listrik	**0.5**
				5.5

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8	**Dr. Ir. Zulfajri B. M.Eng.**	vi	Management dan Regulasi Telekomunikasi	1
		vi	Teknologi Nirkabel	1
			TOTAL	**2**
9	**Dr. Ir. Rhiza S. Sadjad, MSEE**	vi	Perancangan Sistem Kendali	1
		vi	Sistem Kendali Optimal	1
		iv	Dasar Sistem Kendali	1
		vi	Sistem kendali Digital + Praktikum	1
			TOTAL	**4**
10	**Ir. Samuel Panggalo, MT**	vi	Radar dan Navigasi	**1**
		vi	Sistem Telekomunikasi Cerdas	**1**
		ii	Sistem Digital	**1**
		ii	Praktikum Sistem Digital	**0.5**
		ii	Praktikum Sistem Digital	**0.5**
		iv	Elektronika Terintegrasi	**1**
		vi	Kinerja Sistem Telekomunikasi	**1**
				6
11	**Dr. Ir. Sri Mawar Said, MT.**	vi	Sistem Proteksi II + Praktikum	2
		ii	Rangkaian Listrik II	3
		vi	Analisis Mesin Listrik 2 + Praktikum	1
		ii	Praktikum Rangkaian Listrik	1
			TOTAL	**7**
12	**Ir. Zaenab Muslimin, MT**	ii	Rangkaian Listrik II	3
		iv	Sistem Linier	2
		ii	Praktikum Rangkaian Listrik	0.5
		ii	Praktikum Rangkaian Listrik	0.5
			TOTAL	**6**
13	**Ir. Gassing, MT.**	iv	Mesin-Mesin Listrik	1
		iv	Instalasi Listrik + Praktikum	1
		vi	Metode Numerik	1
		vi	Metode Numerik	1
			TOTAL	**4**
14	**Dr.Eng. Ir. Dewiani, MT**	vi-viii	Optimasi Jaringan Telekomunikasi	1
		iv	Sistem Linier	1
		iv	Matematika Teknik II	1.5
		vi	Rekayasa Trafik	1
		vi	Komunikasi Seluler	1
			TOTAL	**5.5**
15	**Dr. Yusran, ST., MT.**	vi	Teknik Lingkungan	1
		vi	Teknik Lingkungan	1
		iv	Matematika Teknik II	1.5
		vi	Elektronika Daya + Praktikum	1
		vi-viii	Opto Elektronika	1
		iv	Mesin-Mesin Listrik	1
			TOTAL	**6.5**
16	**Dr.Eng. Wardi, ST., M.Eng.**	vi-viii	Topik Khusus Jaringan Telekomunikasi	1
		iv	Dasar Multimedia	1
		vi	Komunikasi Seluler	1

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		vi	Sistem (Jaringan) Multimedia	1
		iv	Dasar Multimedia	1
			TOTAL	**5**
17	**Dr.Eng. Elyas, ST., M.Eng.**	iv	Dasar Multimedia	1
		vi	Teknik Lingkungan	1
		vi	Elektronika Telekomunikasi + Praktikum	1.5
		vi	Sistem Telekomunikasi Cerdas	1
		vi	Pengolahan Isyarat Multimedia + Praktikum	1
		vi	Management dan Regulasi Telekomunikasi	1
			TOTAL	**6.5**
18	**Dr.Eng. Intan Sari Areni, MT.**	iv	Sistem Linier	1
		vi	Pengolahan Isyarat Digital	1
		vi	Tapis Analog dan Digital	1
		vi	Pengolahan Isyarat Multimedia + Praktikum	1
		iv	Dasar Multimedia	1
		iv	Sistem Linier	1
			TOTAL	**6**
19	**Dr. Indar Chaerah, ST., MT.**	vi	Teknik Lingkungan	1
		iv	Mesin-Mesin Listrik	1
		iv	Dasar Sistem Kendali	1
			TOTAL	**3**
20	**Ardiaty Arief, ST., MTM., PhD.**	ii	Pemograman Komputer	1
		vi	Konversi Energi	1
		vi	Operasi Sistem tenaga Listrik	1
			TOTAL	**3**
21	**Dr. A. Ejah Umraeni Salam, ST., MT.**	iv	Dasar Sistem Kendali	1
		iv	Sistem Linier	1
		vi	Sistem Kendali Optimal	1
		iv	Praktikum Elektronika Terintegrasi	0.5
		iv	Praktikum Elektronika Terintegrasi	0.5
		vi	Sistem kendali Digital + Praktikum	1
			TOTAL	**5**
22	**Merna Baharuddin, ST., M.Tel.Eng., PhD.**	iv	Elektronika Telekomunikasi + Praktikum	1.5
		vi	Tapis Analog dan Digital	1
		vi	Spread Spectrum	1
		vi	Pengolahan Citra	1
		vi-viii	Topik Khusus Jaringan Telekomunikasi	1
		iv	Dasar Multimedia	1
		iv	Dasar Multimedia	1
			TOTAL	**7.5**
23	**Muhammad Bachtiar Nappu, ST., MT.M.Phil., PhD.**	iv	Mesin-Mesin Listrik	1
		vi	Metode Numerik	1

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		vi	Operasi Sistem tenaga Listrik	1
			TOTAL	**3**
24	**Dr. Hasniati, ST., MT.**	ii	Praktikum Rangkaian Listrik	0.5
		ii	Rangkaian Listrik II	1.5
		iv	Matematika Teknik II	1.5
			TOTAL	**3.5**
25	**Dr.Eng. Yusri Syam Akil, ST., MT.**	iv	Instalasi Listrik + Praktikum	1
		vi	Konversi Energi	1
		vi	Analisis Mesin Listrik 2 + Praktikum	1
			TOTAL	**3**
26	**Muh. Anshar, ST., M.Sc., PhD.**	iv	Sistem Mikroprosesor dan Antarmuka	2
		iv	Prak. Sist. MIkroprocessor dan Antarmuka	0.5
		vi	Pemograman Komputer Lanjut	1
		iv	Praktikum Sistem Mikroprocessor dan Antarmuka	0.5
		iv	Praktikum Sistem Mikroprocessor dan Antarmuka	0.5
		vi	Sistem Kendali Cerdas	1
			TOTAL	**5.5**
27	**Amil Ahmad Ilham, ST., MIT., PhD**	ii	Sistem Digital	1
			TOTAL	**1**
28	**Dr.Eng. Muh. Niswar, ST., M.Info.Tech.**	ii	Sistem Digital	1
		ii	Pemograman Komputer	1
		vi	Pemograman Berorientasi Obyek	1
			TOTAL	**3**
29	**Dr. Ir. Ingrid Nurtanio, MT.**	iv	Matematika Teknik II	1.5
		vi	Sistem Kendali Cerdas	1
			TOTAL	**2.5**
30	**Ir. Christoforus, MT.**	iv	Sistem Mikroprosesor dan Antarmuka	1
		iv	Sistem Mikroprosesor dan Antarmuka	1
		vi	Sistem Operasi Komputer	1
			TOTAL	**3**
31	**Dr. Ir. Zahir Zainuddin, M.Sc.**	iv	Sistem Mikroprosesor dan Antarmuka	1
		iv	Sistem Mikroprocessor dan Antarmuka	1
			TOTAL	**2**

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32	**Ikhlas Kitta**	vi	Teknik Tegangan Tinggi + Praktikum	1
		vi	Distribusi Tenaga Listrik + Praktikum	1
		iv	Instalasi Listrik + Praktikum	1
		iv	Instalasi Listrik + Praktikum	1
			TOTAL	**4**
33	**Ida Rachmaniar Sahali, ST., MT.**	vi	Sistem Operasi Komputer	1
		vi	Pemograman Berorientasi Obyek	1
		ii	Pemogram Komputer	1
		vi	Pemograman Komputer Lanjut	1
		ii	Praktikum Sistem Digital	0.5
		ii	Sistem Digital	1
			TOTAL	**5.5**
34	**Andini Dani Achmad, ST., MT.**	ii	Pemograman Komputer	1
		iv	Matematika Teknik II	1.5
		vi	Sistem (Jaringan) Multimedia	1
		vi	Optimasi Jaringan Telekomunikasi	1
		ii	Sistem Digital	1
			TOTAL	**5.5**
35	**Azran**	ii	Pemograman Komputer	1
		ii	Pemograman Komputer	1
		ii	Praktikum Sistem Digital	0.5
		iv	Praktikum Sistem Mikroprocessor dan Antarmuka	0.5
		iv	Praktikum Elektronika Terintegrasi	0.5
		iv	Elektronika Terintegrasi	1
		vi	Perancangan Sistem Tersemat + Praktikum	1
		vi	Radar dan Navigasi	1
			TOTAL	**6.5**
36	**Tajuddin Waris**	iv	Matematika Teknik II	1.5
		iv	Mesin-Mesin Listrik	1
		ii	Rangkaian Listrik II	1.5
			TOTAL	**4**
37	**Fitriyanti Mayasari**	vi	Manajemen dan Kewirausahaan	1
		vi-vii	Algoritma dan Struktur Data	1
		ii	Rangkaian Listrik II	1.5
		ii	Pemograman Komputer	1
		iv	Dasar Sistem Kendali	1
			TOTAL	**5.5**
38	**Prof. Dr. Ir. H. Muh. Tola, M.Eng.**	ii	Praktikum Rangkaian Listrik	0.5
		vi	Elektronika Daya + Praktikum	1
			TOTAL	**1.5**

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39	**Prof. Dr. Ir. Nadjamuddin Harun, MS.**	iv	Dasar Sistem Kendali	1
			TOTAL	**1**
40	**Prof. Dr. Muh. Arief, Dipl. Ing.**	ii	Praktikum Rangkaian Listrik	**0.5**
			TOTAL	**0.5**

Gowa, 27 Januari 2021
Ketua Departemen Teknik Elektro

Dr.Eng. Ir. Dewiani, M.T.
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Telepon (0411) 586015, 586262, Fax (0411) 586015
Website http://eng.unhas.ac.id, E-mail: elektro@unhas.ac.id

MEETING NOTES

Date and Time : Wednesday, 27th of January 2021
10.00 WITA - End
Place : Meeting Room, Department of Electrical Engineering, Unhas
Topics : 1. Teaching Evaluation of 2020/2021 First Semester
2. Teaching Preparation of 2020/2021 Last Semester

Teaching Evaluation of 2020/2021 First Semester

Index of Graduate Learning Target (SO)

SO 1	SO 2	SO 3	SO 4	SO 5	SO 6	SO 7
3.29	3.43	3.33	3.71	3.59	3.50	2.90

List of courses with performance indicator (PI) value less than 2.75

No	COURSES	PI
1	Probability and Statictics	2.60
2	Alternating Current Transmission	2.55
3	Electrical Power System Analysis	0.64
4	Industrial Automation + Lab	2.65

Teaching team of courses with low performance indicator (IK) value will conduct the meeting to analysis the possible problems and its solutions. The meeting will be documented and given to quality assurance unit (*Dr. A. Ejah Umraeni Salam, S.T., M.T.*).
Performance indicator value of the listed courses is expected to increase in the next semester and other courses with proper IK Value are sustained and improved.

Teaching Preparation of 2020/2021 Last Semester

List of Courses and Lecturers for Last Semester of 2020/2021

NO	NAMA	SMS	MATA KULIAH	SKS
1	**Prof. Dr. Ir. Syafruddin Syarif, MT.**	vi	Information and Coding Theory	2
		vi	Digital Signal Processing	1
		vi	Wireless Technology	1
		vi	Image Processing	1
		ii	Digital System	1
		vi	Telecommunication System Performance	1
			TOTAL	**7**
2	**Prof. Dr. Ir. Ansar Suyuti, MT.**	vi	Algorithm and Data structure	1
		iv	Electric Machinery	1
		iv	Electrical Installation + Lab	1
		vi	Management and Entrepreneurship	1
		vi	Management and Entrepreneurship	2
			TOTAL	**6**
3	**Prof. Dr. Ir. Andani Ahmad, MT**	vi	Control System Design	1
		vi	Spread Spectrum	1

		vi	Traffic Manipulation	1
		iv	Integrated Electronics	1
		iv	Microprocessor and Interface System Lab	0.5
		iv	Microprocessor and Interface System Lab	0.5
		iv	Microprocessor and Interface System Lab	0.5
		ii	Digital System	1
			TOTAL	**6.5**
4	**Prof. Dr.-Ing. Faizal Arya Samman, ST., MT.**			
		iv	Integrated Electronics Lab	0.5
		iv	Integrated Electronics Lab	0.5
		iv	Integrated Electronics Lab	0.5
		ii	Digital System	1
		ii	Digital System Lab	0.5
		ii	Digital System Lab	0.5
		ii	Digital System Lab	0.5
		ii	Digital System Lab	0.5
		vi	Embedded System Design + Lab	1
		vi	Power Electronics + Lab	1
		iv	Integrated Electronics	1
		iv	Integrated Electronics	1
		iv	Integrated Electronics	1
			TOTAL	**9.5**
5	**Prof. Dr. Ir. Salama Manjang, MT.**	vi	High Voltage Engineering + Lab	1
		ii	Electric Circuits Lab	0.5
		vi-vii	New and Renewable Energy Sources	1
		vi	Energy Conversion	1
		vi	Electrical Power Distribution + Lab	1
			TOTAL	**4.5**
6	**Prof. Dr.Eng. Syafaruddin, ST., M.Eng.**	vi	Energy Conversion	1
		vi-viii	New and Renewable Energy Sources	1
		ii	Electric Circuits II	1.5
		ii	Electric Circuits II Lab	0.5
		vi	Numerical Methods	1
			TOTAL	**5**
7	**Dr. Ir. Yustinus, MT**			
		vi - viii	Opto Electronics	**1**
		iv	Basic of Control System	**1**
		ii	Computer Programming	**1**
		ii	Computer Programming	**1**
		iv	Electrical Installation + Lab	1
		ii	Electric Circuits II Lab	**0.5**
				5.5
8	**Dr. Ir. Zulfajri B. M.Eng.**	vi	Management and Regulation of Telecommunication	1
		vi	Wireless Technology	1
			TOTAL	**2**
9	**Dr. Ir. Rhiza S. Sadjad, MSEE**	vi	Control System Design	1
		vi	Optimal Control System	1
		iv	Basic of Control System	1

KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN
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		vi	Digital Control System + Lab	1
			TOTAL	**4**
10	**Ir. Samuel Panggalo, MT**	vi	Radar and Navigation	**1**
		vi	Smart Telecommunication System	**1**
		ii	Digital System	**1**
		ii	Digital System Lab	**0.5**
		ii	Digital System Lab	**0.5**
		iv	Integrated Electronics	**1**
		vi	Telecommunication System Performance	**1**
				6
11	**Dr. Ir. Sri Mawar Said, MT.**	vi	Protection System II + Lab	2
		ii	Electric Circuits II	3
		vi	Electric Machinery Analysis 2 + Lab	1
		ii	Electric Circuits II Lab	1
			TOTAL	**7**
12	**Ir. Zaenab Muslimin, MT**	ii	Electric Circuits II	3
		iv	Linear System	2
		ii	Electric Circuits II Lab	0.5
		ii	Electric Circuits II Lab	0.5
			TOTAL	**6**
13	**Ir. Gassing, MT.**	iv	Electric Machinery	1
		iv	Electrical Installation + Lab	1
		vi	Numerical Methods	1
		vi	Numerical Methods	1
			TOTAL	**4**
14	**Dr.Eng. Ir. Dewiani, MT**	vi-viii	Telecommunication Network Optimation	1
		iv	Linear System	1
		iv	Advanced Mathematics 2	1.5
		vi	Traffic Manipulation	1
		vi	Cellular Communication	1
			TOTAL	**5.5**
15	**Dr. Yusran, ST., MT.**	vi	Environmental Engineering	1
		vi	Environmental Engineering	1
		iv	Advanced Mathematics 2	1.5
		vi	Power Electronics + Lab	1
		vi-viii	Opto Electronics	1
		iv	Electric Machinery	1
			TOTAL	**6.5**
16	**Dr.Eng. Wardi, ST., M.Eng.**	vi-viii	Special Topic on Telecommunication Network	1
		iv	Basic of Multimedia	1
		vi	Cellular Communication	1
		vi	Multimedia System	1
		iv	Basic of Multimedia	1
			TOTAL	**5**
17	**Dr.Eng. Elyas, ST., M.Eng.**	iv	Basic of Multimedia	1
		vi	Environmental Engineering	1
		vi	Telecommunication Electronics + Lab	1.5
		vi	Smart Telecommunication System	1
		vi	Multimedia Signal Processing + Lab	1
		vi	Management and Regulation of Telecommunication	1

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			TOTAL	**6.5**
18	**Dr.Eng. Intan Sari Areni, MT.**	iv	Linear System	1
		vi	Digital Signal Processing	1
		vi	Analog and Digital Filter	1
		vi	Multimedia Signal Processing + Lab	1
		iv	Basic of Multimedia	1
		iv	Linear System	1
			TOTAL	**6**
19	**Dr. Indar Chaerah, ST., MT.**	vi	Environmental Engineering	1
		iv	Electric Machinery	1
		iv	Basic of Control System	1
			TOTAL	**3**
20	**Ardiaty Arief, ST., MTM., PhD.**	ii	Computer Programming	1
		vi	Energy Conversion	1
		vi	Electrical Power System Operation	1
			TOTAL	**3**
21	**Dr. A. Ejah Umraeni Salam, ST., MT.**	iv	Basic of Control System	1
		iv	Linear System	1
		vi	Optimal Control System	1
		iv	Integrated Electronics Lab	0.5
		iv	Integrated Electronics Lab	0.5
		vi	Digital Control System + Lab	1
			TOTAL	**5**
22	**Merna Baharuddin, ST., M.Tel.Eng., PhD.**	iv	Telecommunication Electronics + Lab	1.5
		vi	Analog and Digital Filter	1
		vi	Spread Spectrum	1
		vi	Image Processing	1
		vi-viii	Special Topics on Telecommunication Network	1
		iv	Basic of Multimedia	1
		iv	Basic of Multimedia	1
			TOTAL	**7.5**
23	**Muhammad Bachtiar Nappu, ST., MT.M.Phil., PhD.**	iv	Electric Machinery	1
		vi	Numerical Methods	1
		vi	Electrical Power System Operation	1
			TOTAL	**3**
24	**Dr. Hasniati, ST., MT.**	ii	Electric Circuit II Lab	0.5
		ii	Electric Circuit II	1.5
		iv	Advanced Mathematics 2	1.5
			TOTAL	**3.5**
25	**Dr.Eng. Yusri Syam Akil, ST., MT.**	iv	Electrical Installation + Lab	1
		vi	Energy Conversion	1
		vi	Electric Machinery Analysis II + Lab	1

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			TOTAL	**3**
26	**Muh. Anshar, ST., M.Sc., PhD.**	iv	Microprocessor and Interface System	2
		iv	Microprocessor and Interface System Lab	0.5
		vi	Advanced Computer Programming	1
		iv	Microprocessor and Interface System Lab	0.5
		iv	Microprocessor and Interface System Lab	0.5
		vi	Smart Control System	1
			TOTAL	**5.5**
27	**Amil Ahmad Ilham, ST., MIT., PhD**	ii	Digital System	1
			TOTAL	**1**
28	**Dr.Eng. Muh. Niswar, ST., M.Info.Tech.**	ii	Digital System	1
		ii	Computer Programming	1
		vi	Object Oriented Programming	1
			TOTAL	**3**
29	**Dr. Ir. Ingrid Nurtanio, MT.**	iv	Advanced Mathematics 2	1.5
		vi	Smart Control System	1
			TOTAL	**2.5**
30	**Ir. Christoforus, MT.**	iv	Microprocessor and Interface System	1
		iv	Microprocessor and Interface System	1
		vi	Computer Operation System	1
			TOTAL	**3**
31	**Dr. Ir. Zahir Zainuddin, M.Sc.**	iv	Microprocessor and Interface System	1
		iv	Microprocessor and Interface System	1
			TOTAL	**2**
32	**Ikhlas Kitta**	vi	High Voltage Engineering + Lab	1
		vi	Electrical Power Distribution + Lab	1
		iv	Electrical Installation + Lab	1
		iv	Electrical Installation + Lab	1
			TOTAL	**4**
33	**Ida Rachmaniar Sahali, ST., MT.**	vi	Computer Operation System	1
		vi	Object Oriented Programming	1
		ii	Computer Programming	1
		vi	Advanced Computer Programming	1
		ii	Digital System Lab	0.5
		ii	Digital System	1
			TOTAL	**5.5**
34	**Andini Dani Achmad, ST., MT.**	ii	Computer Programming	1
		iv	Advanced Mathematics 2	1.5

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		vi	Multimedia System	1
		vi	Telecommunication Network Optimization	1
		ii	Digital System	1
			TOTAL	**5.5**
35	**Azran**	ii	Computer Programming	1
		ii	Computer Programming	1
		ii	Digital System Lab	0.5
		iv	Microprocessor and Interface System Lab	0.5
		iv	Integrated Electronics Lab	0.5
		iv	Integrated Electronics	1
		vi	Embedded System Design + Lab	1
		vi	Radar and Navigation	1
			TOTAL	**6.5**
36	**Tajuddin Waris**	iv	Advanced Mathematics 2	1.5
		iv	Electric Machinery	1
		ii	Electric Circuits II	1.5
			TOTAL	**4**
37	**Fitriyanti Mayasari**	vi	Management and Entrepreneurship	1
		vi-vii	Algorithm and Data Structure	1
		ii	Electric Circuits II	1.5
		ii	Computer Programming	1
		iv	Basic of Control System	1
			TOTAL	**5.5**
38	**Prof. Dr. Ir. H. Muh. Tola, M.Eng.**	ii	Electric Circuits II Lab	0.5
		vi	Power Electronics + Lab	1
			TOTAL	**1.5**
39	**Prof. Dr. Ir. Nadjamuddin Harun, MS.**	iv	Basic of Control System	1
			TOTAL	**1**
40	**Prof. Dr. Muh. Arief, Dipl. Ing.**	ii	Electric Circuits II Lab	**0.5**
			TOTAL	**0.5**

Gowa, 27th of January 2021
Head of Electrical Engineering

signed

Dr.Eng. Ir. Dewiani, M.T.
NIP. 19691026 199412 2 001

NOTULENSI FOCUS GROUP DISCUSSION
EVALUASI MATA KULIAH
SEMESTER AKHIR 2018-2019
PROGRAM STUDI S1 TEKNIK ELEKTRO DEPARTEMEN TEKNIK ELEKTRO

NAMA MATA KULIAH : **RANGKAIAN LISTRIK 2**
KODE MATA KULIAH : **105D4123**

Hari, Tanggal : Jumat, 28 Juni 2019
Pukul : 08.30 – 11.00 WITA
Dosen Yang hadir : 1. Dr. Ir. Sri Mawar Said, M.T.
2. Ir. Zaenab Muslimin, M.T.
3. Hasniati, S.T., M.T.

Sebaran jumlah mahasiswa dengan capaian nilai Mata Kuliah Rangkaian Listrik 2 ditunjukkan pada tabel berikut ini:

A	A-	B+	B	B-	C+	C	D	E	TOTAL
21	19	9	13	10	7	8	28	6	121

Indeks mutu untuk mata kuliah Rangkaian Listrik 2 kurang dari 2.75 yakni 2.60, hal ini disebabkan dari 121 mahasiswa terdapat 4.96% yang tidak melulusi mata kuliah ini dan 48.8% mahasiswa lulus dengan nilai di bawah B.

Student Outcome (SO-#)	Performance Indicator (PI)	PI Point
SO-1	1A	2.60

Deskripsi Sumber Masalah:

Kurangnya contoh soal dan penyelesaian yang diberikan kepada mahasiswa

Rekomendasi Perbaikan untuk Dilaksanakan:

1. Perlu dilakukan tutorial berisi pembahasan soal-jawab yang diberikan kepada mahasiswa
2. Perlu memberikan mahasiswa beberapa panduan dalam menyelesaikan soal-soal
3. Mengorganisir tugas-tugas mahasiswa lebih baik lagi

Gowa, 28 Juni 2019
Koordinator MK Rangkaian Listrik 2

Dr. Ir. Sri Mawar Said, M.T.
NIP. 19601106 198601 2 001

MEETING MINUTES
FOCUS GROUP DISCUSSION
EVALUATION OF COURSE IN THE 2ND SEMESTER 2018-2019
ELECTRICAL ENGINEERING STUDY PROGRAM

OURSE NAME : **ELECTRIC CIRCUITS 2**
COURSE CODE : **105D4123**

Day, Date : Friday, 28 June 2019
Time : 08.30 – 11.00 WITA
List of Attendees : 1. Dr. Ir. Sri Mawar Said, M.T.
2. Ir. Zaenab Muslimin, M.T.
3. Hasniati, S.T., M.T.

The distribution of the number of Electric Circuits 2 Course's students having any grade points is shown in the following table.

A	A-	B+	B	B-	C+	C	D	E	TOTAL
21	19	9	13	10	7	8	28	6	121

The performance indicator of Electric Circuits 2 is lower than expected point 2.75, i.e. 2.60. This is because from 121 students enrolled this course, 4.96% of them cannot pass the final exam. 48.8% pass the final exam who has grade point lower than B grade.

Student Outcome (SO-#)	Performance Indicator (PI)	PI Point
SO-1	1A	2.60

Problems Sources:

The lack of examples of questions and solutions.

Necessary Recommendations for Improvement (Future Actions):

1. It is necessary to do a tutorial containing a discussion of the questions and answers given to students.
2. Need to give students some guidance in solving problems
3. Organizing student assignments better

Gowa, 28 June 2019
Course Coordinator

Signed

Dr. Ir. Sri Mawar Said, M.T.
NIP. 19601106 198601 2 001

NOTULENSI FOCUS GROUP DISCUSSION
EVALUASI MATA KULIAH
SEMESTER AWAL 2019-2020
PROGRAM STUDI S1 TEKNIK ELEKTRO DEPARTEMEN TEKNIK ELEKTRO

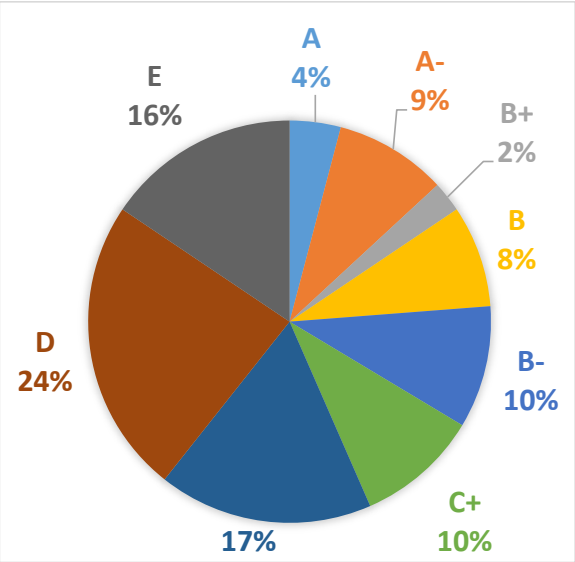
NAMA MATA KULIAH : **DASAR ELEKTRONIKA**
KODE MATA KULIAH : **204D4112**

Hari, Tanggal : Jumat, 10 Januari 2020
Pukul : 10.00 – 12.00 WITA
Dosen Yang hadir : 1. Prof. Dr.-Ing.Faizal A.Samman, ST., MT.
2. Prof. Dr. Ir. Andani Achmad, ST.,MT.
3. Dr. Eng. Wardi, ST, M.Eng.
4. Muh. Anshar, ST, MSc., Ph.D

Setelah mengevaluasi hasil pembelajaran pada mata kuliah Dasar Elektronika, maka sebaran jumlah mahasiswa dengan capaiaan nilainya ditunjukkan pada tabel berikut ini:

A	A-	B+	B	B-	C+	C	D	E	TOTAL
5	11	3	10	12	12	21	29	19	122

Grafik sebaran nilai ditunjukkan pada gambar berikut ini.



Dari 122 mahasiswa terdapat 15.57% yang tidak melulusi mata kuliah ini dan 60.66% mahasiswa lulus dengan nilai di bawah B, hal ini lah yang menyebabkan indeks mutu mata kuliah Dasar Elektronika di bawah 2.75 yakni 1.93.

Student Outcome (SO-#)	Performance Indicator (PI)	PI Point
SO-1	1A	1.93

Deskripsi Sumber Masalah:

1. Mahasiswa tidak memahami materi dengan baik
2. Materi kurang dipahami karena kurangnya contoh soal dan penyelesaian

Rekomendasi Perbaikan untuk Dilaksanakan:

1. Perlu dilakukan tutorial berisi pembahasan soal-jawab yang diberikan kepada mahasiswa
2. Perlu memberikan mahasiswa beberapa panduan dalam menyelesaikan soal-soal
3. Materi/modul pembelajaran untuk diunggah di SIKOLA agar dapat dengan mudah diakses oleh mahasiswa

Gowa, 10 Januari 2020
Koordinator MK Dasar Elektronika

Prof.Dr.Ing.Faizal.A.Samman, ST.,MT
NIP. 19691026 199412 2 001

MEETING MINUTES
FOCUS GROUP DISCUSSION
EVALUATION OF COURSE IN THE 2ND SEMESTER 2019-2020
ELECTRICAL ENGINEERING STUDY PROGRAM

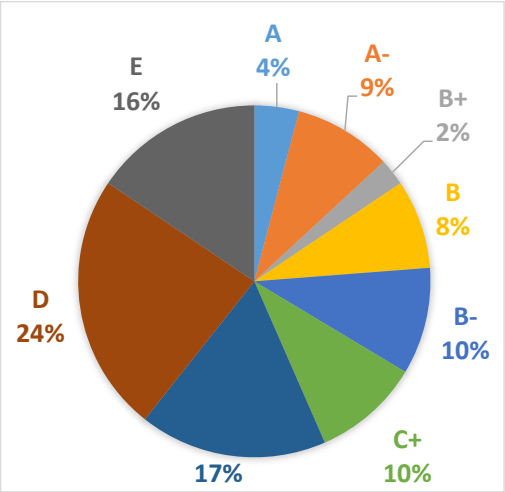
OURSE NAME : **BASIC ELECTRONICS**
COURSE CODE : **204D4112**

Day, Date : Friday, 10 January 2020
Time : 10.00 – 12.00 WITA
List of Attendees : 1. Prof. Dr.-Ing. Faizal A.Samman, ST, MT
2. Prof. Dr. Ir. Andani Achmad, ST, MT
3. Dr. Eng. Wardi, ST, M.Eng.
4. Muh.Anshar, ST, MSc, Ph.D

After evaluating the learning process of Basic Electronic Course, then the distribution of the number of students having any grade points is shown in the following table.

A	A-	B+	B	B-	C+	C	D	E	TOTAL
5	11	3	10	12	12	21	29	19	122

The graph of the grade point distribution is shown in the following figure.



There are 122 students enrolled this course. 15.57% of then cannot pass the final exam. 60.66% pass the final exam who has grade point lower than B grade. Therefore the performance indication value of this course is lower than the expected point 2.75, i.e. only 1.93.

Student Outcome (SO-#)	Performance Indicator (PI)	PI Point
SO-1	1A	1.93

Problems Sources:

1. Students do not understand the material well.
2. The material is not understood because of the lack of examples of questions and solutions.

Necessary Recommendations for Improvement (Future Actions):

1. It is necessary to do a tutorial containing a discussion of the questions and answers given to students.
2. Need to give students some guidance in solving problems
3. Learning materials/modules to be uploaded on SIKOLA so that they can be easily accessed by students.

Gowa, 10 January 2020
Course Coordinator

Signed

Prof.Dr.Ing.Faizal.A.Samman, ST.,MT
NIP. 19691026 199412 2 001

NOTULENSI FOCUS GROUP DISCUSSION
EVALUASI MATA KULIAH
SEMESTER AKHIR 2019-2020
PROGRAM STUDI S1 TEKNIK ELEKTRO DEPARTEMEN TEKNIK ELEKTRO

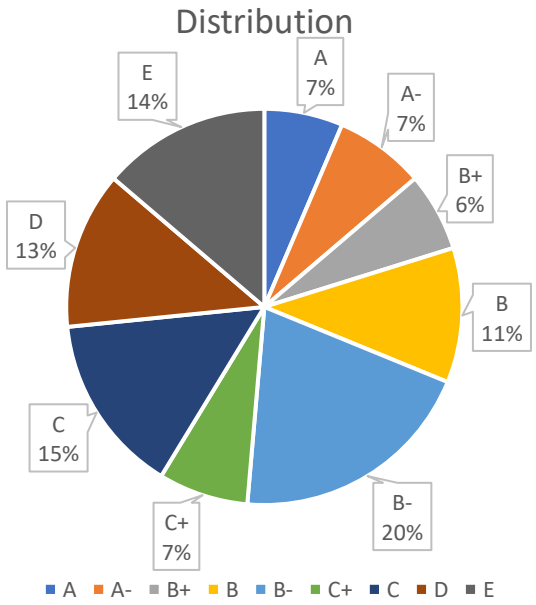
NAMA MATA KULIAH : **ELEKTRONIKA TERINTEGRASI**
KODE MATA KULIAH : **214D4122**

Hari, Tanggal : Rabu, 24 Juni 2020
Pukul : 14.00 – 16.00 WITA
Dosen Yang hadir : 1. Prof. Dr.-Ing.Faizal A.Samman, ST., MT.
2. Andreas Vogel, Dipl.-Ing.

Setelah mengevaluasi hasil pembelajaran pada mata kuliah Elektronika Terintegrasi, maka sebaran jumlah mahasiswa dengan capaiaan nilainya ditunjukkan pada tabel berikut ini:

A	A-	B+	B	B-	C+	C	D	E	TOTAL
7	8	7	12	22	8	16	14	15	109

Grafik sebaran nilai ditunjukkan pada gambar berikut ini.



Dari 94 mahasiswa terdapat 13.76% yang tidak melulusi mata kuliah ini dan 68.81% mahasiswa lulus dengan nilai di bawah B, hal ini lah yang menyebabkan indeks mutu mata kuliah Elektronika Terintegrasi di bawah 2.75 yakni 2.24. Namun, nilai ini mengalami peningkatan dari tahun lalu yakni 2.09.

Student Outcome (SO-#)	Performance Indicator (PI)	PI Point
SO-1 SO-2	1D 2I	2.24

Deskripsi Sumber Masalah:

Mahasiswa tidak memahami materi dengan baik

Rekomendasi Perbaikan untuk Dilaksanakan:

1. Perlu memperbaiki metode pembelajaran
2. Memberikan cukup latihan soal kepada mahasiswa

Gowa, 24 Juni 2020
Koordinator MK Elektronika Terintegrasi

Prof.Dr.Ing.Faizal.A.Samman, ST.,MT
NIP. 19691026 199412 2 001

MEETING MINUTES
FOCUS GROUP DISCUSSION
EVALUATION OF COURSE IN THE 2ND SEMESTER 2019-2020
ELECTRICAL ENGINEERING STUDY PROGRAM

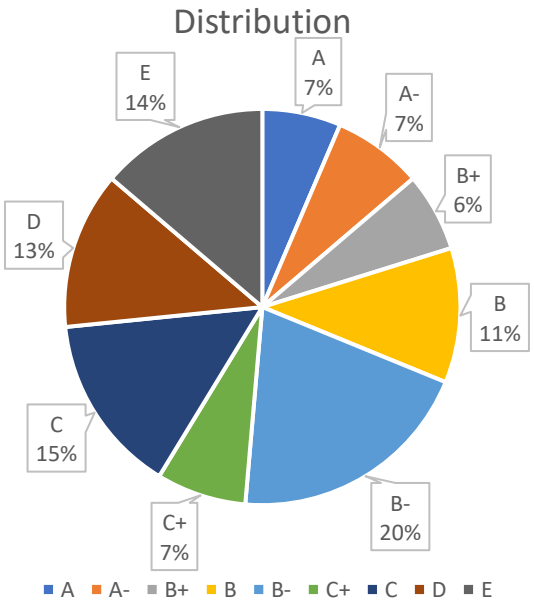
OURSE NAME : **INTEGRATED ELECTRONICS**
COURSE CODE : **214D4122**

Day, Date : Wednesday, 24 June 2020
Time : 14.00 – 16.00 WITA
List of Attendees : 1. Prof. Dr.-Ing.Faizal A.Samman, ST., MT.
2. Andreas Vogel, Dipl.-Ing.

After evaluating the learning process of Integrated Electronics Course, then the distribution of the number of students having any grade points is shown in the following table.

A	A-	B+	B	B-	C+	C	D	E	TOTAL
7	8	7	12	22	8	16	14	15	109

The graph of the grade point distribution is shown in the following figure.



There are 94 students enrolled this course, 13.76% of then cannot pass the final exam. 68.81% pass the final exam who has grade point lower than B grade. Therefore, the performance indication value of this course is lower than the expected point 2.75, i.e. only 2.24. However, this value has increased from last year, i.e. 2.09.

Student Outcome (SO-#)	Performance Indicator (PI)	PI Point
SO-1 SO-2	1D 2I	2.24

Problems Sources:

Students do not understand the material well.

Necessary Recommendations for Improvement (Future Actions):

1. Need to improve learning methods
2. Provide enough practice questions to students

Gowa, 24 June 2020
Course Coordinator

Signed

Prof.Dr.Ing.Faizal.A.Samman, ST.,MT
NIP. 19691026 199412 2 001

NOTULENSI FOCUS GROUP DISCUSSION
EVALUASI MATA KULIAH
SEMESTER AWAL 2020-2021
PROGRAM STUDI S1 TEKNIK ELEKTRO DEPARTEMEN TEKNIK ELEKTRO

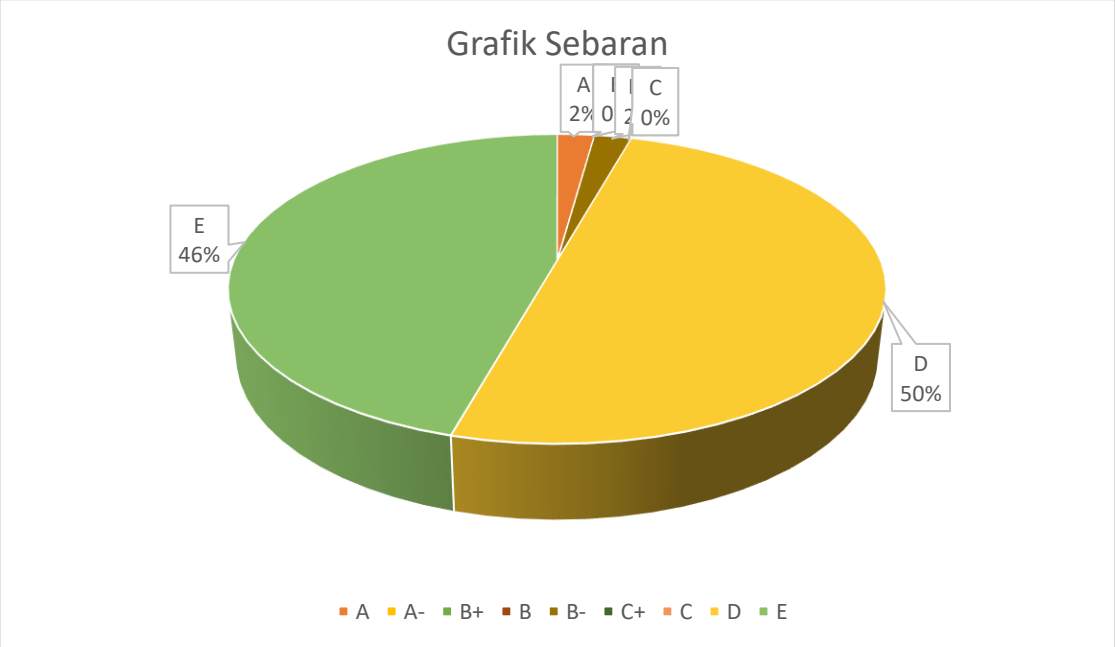
NAMA MATA KULIAH : **ANALISIS SISTEM TENAGA LISTRIK**
KODE MATA KULIAH : **306D4112**

Hari, Tanggal : Senin, 1 Februari 2021
Pukul : 09.30 – 11.00 WITA
Dosen Yang hadir : 1. Dr. Indar Chaerah Gunadin, S.T., M.T.
2. Ardiaty Arief, S.T., M.T., Ph.D.

Setelah mengevaluasi hasil pembelajaran pada mata kuliah Analisis Sistem Tenaga Listrik, maka sebaran jumlah mahasiswa dengan capaiaan nilainya ditunjukkan pada tabel berikut ini:

A	A-	B+	B	B-	C+	C	D	E	TOTAL
1	0	0	0	1	0	0	23	21	46

Grafik sebaran nilai ditunjukkan pada gambar berikut ini.



Dari 46 mahasiswa terdapat 45.65% yang tidak melulusi mata kuliah ini dan 52.17% mahasiswa lulus dengan nilai di bawah B, hal ini lah yang menyebabkan indeks mutu mata kuliah Analisa Sistem Tenaga Listrik di bawah 2.75 yakni 0.65

Student Outcome (SO-#)	Performance Indicator (PI)	PI Point
SO-1	1A	0.64

Deskripsi Sumber Masalah:

Mahasiswa tidak memahami materi dengan baik

Rekomendasi Perbaikan untuk Dilaksanakan:

1. Dosen perlu memperbaiki metode pembelajaran
2. Perlu memberika langkah-langkah dalam mengerjakan soal-soal yang diberikan
3. Materi/modul pembelajaran untuk diunggah di SIKOLA agar dapat dengan mudah diakses oleh mahasiswa

Gowa, 1 Februari 2021
Koordinator MK Analisis Sistem Tenaga Listrik

Dr. Indar Chaerah Gunadin, S.T., M.T.
NIP. 19731118 199803 2 001

MEETING MINUTES
FOCUS GROUP DISCUSSION
EVALUATION OF COURSE IN THE 1st SEMESTER 2020-2021
ELECTRICAL ENGINEERING STUDY PROGRAM

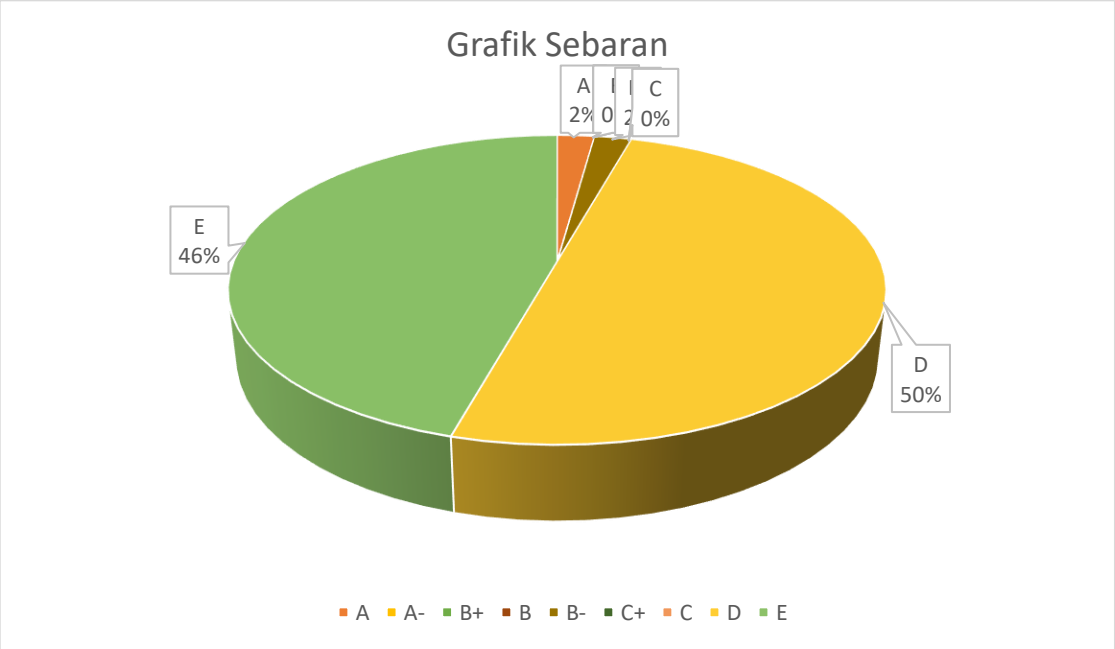
OURSE NAME : **POWER ELECTRIC SYSTEM ANALYSIS**
COURSE CODE : **306D4112**

Day, Date : Monday, 1 February 2021
Time : 09.30 – 11.00 WITA
List of Attendees : 1. Dr. Indar Chaerah Gunadin, S.T., M.T.
2. Ardiaty Arief, S.T., M.T., Ph.D.

After evaluating the learning process of Power Electronic System Analysis Course, then the distribution of the number of students having any grade points is shown in the following table.

A	A-	B+	B	B-	C+	C	D	E	TOTAL
1	0	0	0	1	0	0	23	21	46

The graph of the grade point distribution is shown in the following figure.



There are 46 students enrolled this course, 45.65% of then cannot pass the final exam. 52.17% pass the final exam who has grade point lower than B grade. Therefore the performance indication value of this course is lower than the expected point 2.75, i.e. only 0.65.

Student Outcome (SO-#)	Performance Indicator (PI)	PI Point
SO-1	1A	0.64

Problems Sources:

Students do not understand the material well.

Necessary Recommendations for Improvement (Future Actions):

1. Lecturers need to improve learning methods
2. It is necessary to provide steps in working on the questions given
3. Learning materials/modules to be uploaded on SIKOLA so that they can be easily accessed by students.

Gowa, 1 February 2021
Course Coordinator

Signed

Dr. Indar Chaerah Gunadin, S.T., M.T.
NIP. 19731118 199803 2 001

NOTULENSI FOCUS GROUP DISCUSSION
EVALUASI MATA KULIAH
SEMESTER AKHIR 2018-2019
PROGRAM STUDI S1 TEKNIK ELEKTRO DEPARTEMEN TEKNIK ELEKTRO

NAMA MATA KULIAH : **PEMROGRAMAN KOMPUTER**
KODE MATA KULIAH : **107D4122**

Hari, Tanggal : Kamis, 27 Juni 2019
Pukul : 13.30 – 15.00 WITA
Dosen Yang hadir : 1. Dr. Adnan, S.T., M.T.
2. Dr.Eng. Muh. Niswar, S.T., M.I.T.
3. Ida Rachmaniar Sahali, S.T., M.T.
4. Andini Dani Achmad, S.T., M.T.

Sebaran jumlah mahasiswa mata kuliah Pemrograman Komputer dengan capaian nilai ditunjukkan pada tabel berikut ini:

A	A-	B+	B	B-	C+	C	D	E	TOTAL
19	6	12	21	11	13	10	3	14	109

Indeks mutu untuk mata kuliah ini adalah 2.65 (kurang dari 2.75). Hal ini disebabkan dari 109 mahasiswa, sebanyak 33.9% mahasiswa lulus dengan nilai di bawah B dan 12.8% mahasiswa tidak lulus.

Student Outcome (SO-#)	Performance Indicator (PI)	PI Point
SO-1	2D	2.65

Tujuan dari mata kuliah ini adalah mahasiswa mampu menghasilkan/mendesain solusi suatu masalah dengan cara menyusun instruksi dalam bahasa pemrograman dengan benar

Deskripsi Sumber Masalah:

1. Idealnya mata kuliah ini dijelaskan langsung dengan contoh kerja/praktik namun kenyataannya tidak dilaksanakan seperti itu.
2. Mahasiswa kurang berlatih menyusun program bahasa pemrograman

Rekomendasi Perbaikan untuk Dilaksanakan:

1. Dosen memberikan cukup unjuk kerja dalam proses belajar mengajar
2. Perlu memberikan cukup tugas untuk melatih kemampuan mahasiswa untuk melakukan pemrograman

Gowa, 27 Juni 2019
Koordinator MK Pemrograman Komputer

Dr. Adnan, S.T., M.T
NIP. 19740426 200312 1 002

MEETING MINUTES
FOCUS GROUP DISCUSSION
EVALUATION OF COURSE IN THE 2ND SEMESTER 2018-2019
ELECTRICAL ENGINEERING STUDY PROGRAM

OURSE NAME : **COMPUTER PROGRAMMING**
COURSE CODE : **107D4122**

Day, Date : Thursday, 27 June 2019
Time : 13.30 – 15.00 WITA
List of Attendees : 1. Dr. Adnan, S.T., M.T.
2. Dr.Eng. Muh. Niswar, S.T., M.I.T.
3. Ida Rachmaniar Sahali, S.T., M.T.
4. Andini Dani Achmad, S.T., M.T.

The distribution of the number of Computer Programming Course's students having any grade points is shown in the following table.

A	A-	B+	B	B-	C+	C	D	E	TOTAL
19	6	12	21	11	13	10	3	14	109

This course's performance indicator is 2.75 (lower than expected point 2.75). This is because from 121 students enrolled this course, 33.9% of them pass with grade point lower than B grade and 12.8% of them cannot pass the final exam.

Student Outcome (SO-#)	Performance Indicator (PI)	PI Point
SO-1	2D	2.65

The purpose of this course is that students are able to generate/design solutions to a problem by properly compiling instructions in a programming language

Problems Sources:

1. The lack of examples of questions and solutions.
2. Students lack practice

Necessary Recommendations for Improvement (Future Actions):

1. The lecturer gives enough performance in the teaching and learning process
2. Need to give enough assignments to train students' ability to do programming

Gowa, 27 June 2019
Course Coordinator

Signed

Dr. Adnan, S.T., M.T
NIP. 19740426 200312 1 002

CURRICULUM
(Capstone Design Projects)

The EESP Response to ABET Statement #2:

2. Criterion 5. Curriculum

This criterion requires that the program must include a culminating major engineering design experience that incorporates appropriate engineering standards and multiple constraints. The program has a capstone experience that is distributed over several courses. Appropriate engineering standards and multiple constraints were addressed indirectly in some senior design projects, but most project reports did not include evidence of the incorporation of engineering standards and constraints. Without adequate experience in the application of design constraints and engineering standards, students in the program may not be adequately prepared for engineering practice. Thus, the strength of compliance with this criterion is lacking.

30-Day Due-Process Response

The EAC acknowledges receipt of documentation detailing recent actions taken to address this shortcoming. The program has redesigned two existing design courses as capstone design courses to be taken in the final year of the curriculum. In the final project's students would be asked to incorporate engineering standards and design constraints, but revised syllabi have not been provided requiring this. Of the seven student project assignment statements provided, only one requires engineering standards and constraints to be considered; the other six assignments do not require such considerations. Thus, the strength of compliance with this criterion is lacking.

Status

The program weakness is unresolved. In preparation for next review, the EAC anticipates documentation, in English, demonstrating the capstone design courses incorporate appropriate design constraints and engineering standards.

The EESP Response:

The term "capstone design" was only known to the EESP faculty in 2018 when the ABET accreditation process began. Some efforts to turn the orientation of the learning process from the R&D-based 2015 Curriculum toward more design-based have been implemented since 2019 when the curriculum itself almost ended. One of these efforts included the integration of R&D activities in several laboratories into a rather large scale "capstone-design" project. In the new 2021 Curriculum (will be implemented in First Semester or Summer Semester of the year 2021), the R&D-oriented courses Laboratory 1 (8 credit-hours) and Laboratory 2 (8 credit-hours) from the previous curriculum are to be replaced by Electrical Engineering System Design 1 having 3 credit-hours and Electrical Engineering System Design 2 having 3 credit-hours, which are design-oriented courses. However, it must be underlined that the R&D activities in the research laboratories have become the ultimate learning process to implement all knowledge and skills attained in the previous courses.

In this report, we have given 6 examples of capstone design course reports, presenting the design constraints and engineering standards that must be fulfilled by student during the design process.

FINAL PROJECT EESP

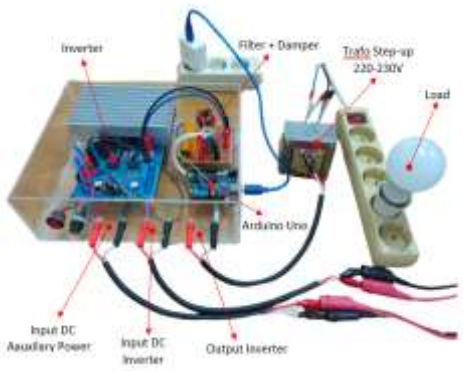
PROJECT TITLE : **SINGLE-PHASE DC-AC INVERTER**
STUDENT NAME : **MUHAMMAD ASWAN**
EXAM. YEAR : 2021
SUPERVISOR : **PROF. DR.-ING. FAIZAL ARYA SAMMAN and DR. ANDI EJAH UMRAENI SALAM, ST, MT.**

DESIGN SPECIFICATION AND CONSTRAINT:
The inverter with designed power passive filter should result in a sinusoidal output voltage having total harmonic distortion lower than 5%. The other design specification and constraints are in the following:

- Output Frequency: 50Hz.
- Output Voltage: 220-230V (without Load)
- Total Harmonic Distortion (THD): < 10%.

An application control software is embedded in a microcontroller, which can generate a pulse-width modulated (PWM) signal to control the inverter output voltage.

ENGINEERING STANDARD:
The aforementioned THD constraint follows the IEEE Standard 519-1992 for dedicated system application i.e. below 10%. Meanwhile, the IEEE: 519-2014 mentions that THD must be lower than 8%.

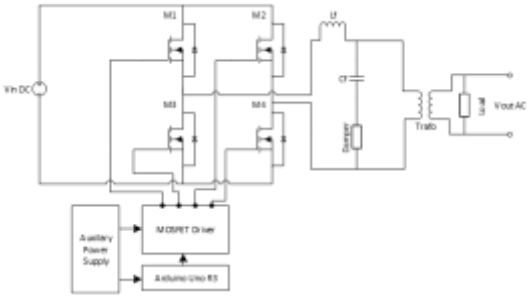


DC-AC Single-Phase Inverter and its testing environment

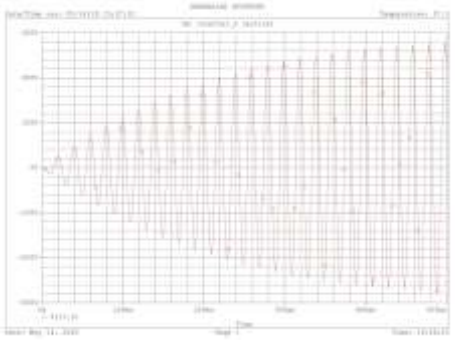
DC-AC Single-Phase Inverter is one of the important components in solar-grid electric controller products. This module has the function of converting a DC signal into an AC signal. Therefore, the signal can be used or connected to electrical loads. This single phase inverter design is based on a micro bridge controller with a full bridge configuration. The microcontroller generates a PWM signal which will be used to drive the MOSFET. The output of this inverter will be filtered using an inductor-capacitor passive filter circuit in order to obtain a pure sinusoidal output with a minor total percentage of harmonic distortion.

The figure below, represent the results of the test equipment. We have also developed a single-phase DC-AC inverter unit that is controlled using FPGA devices in order to improve the performance and integrity of the prototype.

Circuit Modeling and Simulation using Cadence PSPice



Circuit Schematic

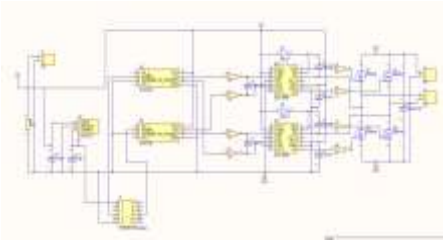


Sumulation Results Uisng SPICE

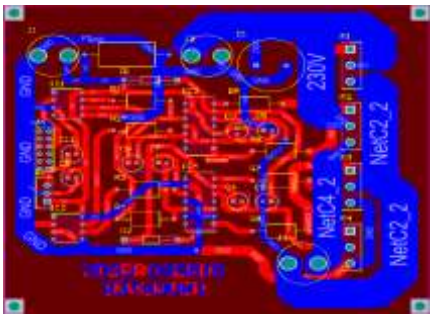
SPICE CIRCUIT MODEL PROGRAM:

```
RANGKAIAN INVERTER
VDD          1 0 DC       34V
CS           1 0 100u
********************* MOSFET
M1 1 4 2 2 IRFP460
M2 1 5 3 3 IRFP460
M3 2 6 0 0 IRFP460
M4 3 7 0 0 IRFP460
.MODEL IRFP460 NMOS (VTO=2.831 KP=31.2u L=1u W=30m CGDO=3.358N
CGSO=18.054N)
*.MODEL IRFP460 NMOS (VTO=2.831 KP=31.2u L=1u W=30m CGDO=0 CGSO=0)
*.MODEL IRFP460 NMOS (VTO=2.831 KP=31.2u L=1u W=2.97m CGDO=0.418N
CGSO=3.78N)
********************* Dioda
D1 2 1 DIN750
D2 3 1 DIN750
D3 0 2 DIN750
D4 0 3 DIN750
.MODEL DIN750 D(Is=880.5E-18 Rs=.25 Ikf=0 N=1 Xti=3 Eg=1.11 Cjo=175p
M=.5516
+Vj=.75 Fc=.5 Isr=1.859n Nr=2 Bv=4.7 Ibv=20.245m Nbv=1.6989
+Ibvl=1.9556m Nbvl=14.976 Tbv1=-21.277u)
*D(Is=880.5E-18 Rs =.25 Ikf=0 N = 1 Xti = 3 Eg=1.11
*+Cjo = 175p M=0.5516 Vj=.75 FC = .5 Isr=1.859n Nr=2 Bv=4.7 Ibv=20.245m
*+Nbv = 1.6989 Ibvl= 1.9536m Nbvl=14.976)
*************** Pembangkitan pulsa
.PARAM M=0.9 fout=50Hz p=100; p adalah jumlah pulsa spwm
V_mod 16 0 AC 0 SIN (0 {M} {fout} 0 0 0); membangkitkan sinyal sinusoidal 50Hz
E_ABS 15 0 VALUE {ABS(V(16))}; mengabsolutkan gelombang sinusoidal
Vref 14 0 PULSE (1 0 0 {1/(2*{2*p*fout})} {1/(2*{2*p*fout})-1ns} 1ns
{1/{2*p*fout}})
Vx 13 0 PULSE (0 1 0 1ns 1ns {1/(2*{fout})-2ns} {1/{fout}})
E_ABM12 12 0 VALUE {1-V(13)} ; Inverting V(13,0)
E_ABM21 11 0 VALUE {IF(V(15)-V(14)>0, 1, 0)} ;membandingkan V(15,0) dengan
V(14,0)
E_MULT1 9 0 VALUE {V(11)*V(13)} ; mengalikan V(11,0) dengan V(13)
E_MULT2 8 0 VALUE {V(11)*V(12)} ; mengalikan V(11,0) dengan V(12)
****** PEMBANGKITAN PULSA SPWM
EG1 4 2 8 0 34
EG3 7 0 8 0 34
EG2 5 3 9 0 34
EG4 6 0 9 0 34
***** Pembangkitan PULSE
*EG1 4 2 18 0 35
*EG3 7 0 18 0 35
*EG2 5 3 19 0 35
*EG4 6 0 19 0 35
*****
*VG1 18 0 PULSE (0 {M} 0 0.1ms 0.1ms 1.8ms 4ms)
*EINVG1 19 0 VALUE {{M} - V(18,0)}
*************** Beban
RLOAD 2 17 6
*************** Filter LC
L1 17 18 60mH
C1 18 3 300uF
R1 18 3 600
*************** Filter LCL
*L1 2 17 10H
*L2 17 18 8H
*C1 17 3 1uF
*************** Filter LLCL
*L1 2 17 5uH
*L2 17 18 5uH
*L3 17 19 5uH
*C1 18 3 5uF
*.STEP PARAM p List 10 20 50 100
.TRAN 0.1ms 200ms 0 0.1ms
.FOUR 50Hz 20 V(3,18)
.OPTIONS ABSTOL=1uA CHGTOL=0.01nC ITL2=100 ITL4=150 RELTOL=0.1
VNTOL=0.1
.PROBE V(9,0) V(8,0) V(2,3) V(11,0) V(14,0) V(15,0) V(13,0) V(3,2) V(16,0) V(3,17)
V(3,18) V(2,17)
.END
```

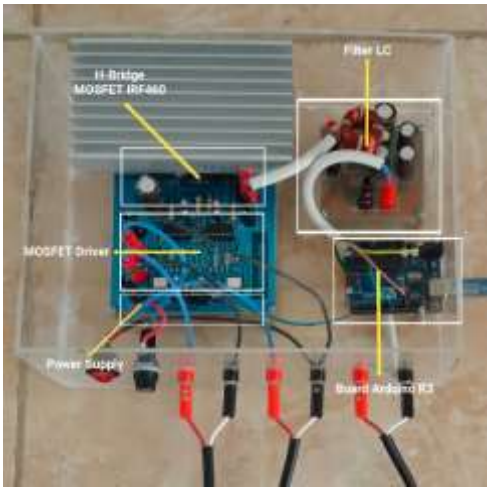
Design and Testing Results



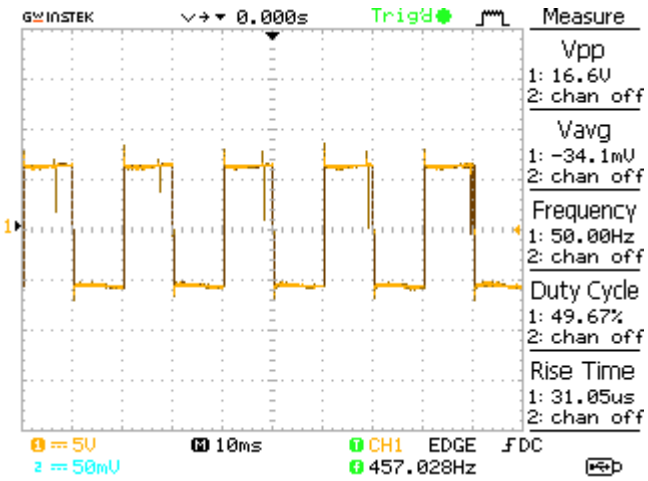
The inverter schematic circuit design



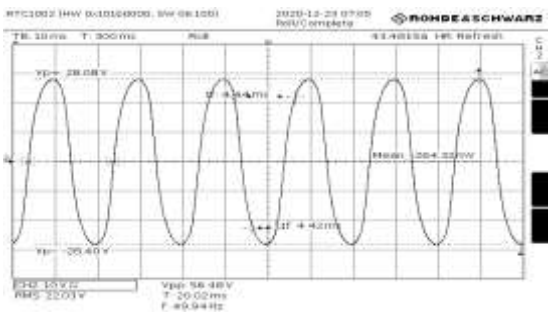
The inverter's PCB



Photograph of the design result



Inverter output Signal without Filter



Inverter output Signal with LC Filter

The testing result of the inverter using SPWM method is as follows: output voltage 226.00, and THD with load about 15.09%, without load 12.96%.

FINAL PROJECT EESP

PROJECT TITLE : **ANTENA *RECONFIGURABLE* UNTUK TEKNOLOGI 5G**
STUDENT NAME : **Rayvaldo Stefan Ma'dika**
REG. NO : **D41115012**
EXAM. YEAR : 2019
SUPERVISOR : **Dr.Eng. Ir. Dewiani, MT. and**
Elyas Palantei, ST., M.Eng. PhD.

DESIGN SPECIFICATION AND CONSTRAINT:

The antenna should work fine at both 3.5GHz and 4.8GHz with simulated radiation pattern shows unidirectional pattern that mainly aimed at the top of the patch. The value for return loss at 3.5GHz resonant frequency should be around -40dB at 3.52GHz and for 4.8GHz resonant frequency should be around -38dB.

ENGINEERING STANDARD:

Design of Antenna is used for 5G technology that work at 3.5GHz and 4.8GHz frequency.

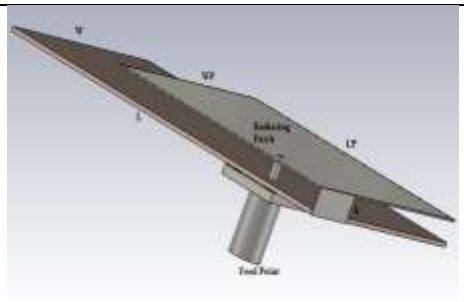


Fig. 1. Structure of PIFA Antenna

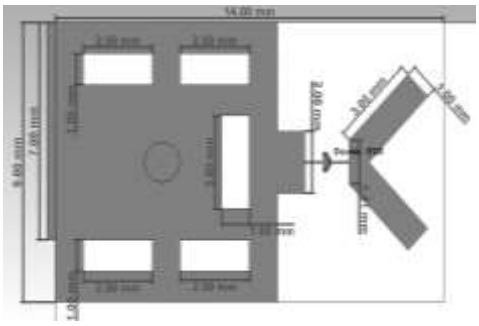


Fig. 2. Top View of Radiating Patch

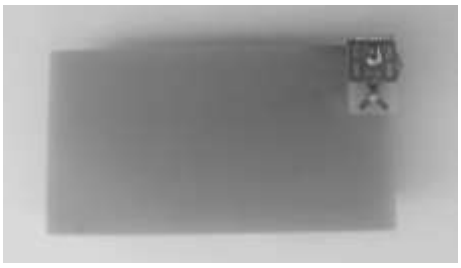


Fig. 3. Fabricated Antenna

Design of Reconfigurable Planar Inverted F Antenna is used for the upcoming 5G technology that work at 3.5GHz and 4.8GHz frequency. The aim of design is to create an antenna that can change its parameter (reconfigurable) so the antenna can switch from low band frequency to high band frequency and vice versa. It is designed on FR4 substrate with h = 1.6mm and dielectric constant εr = 4.3. The patch is placed 5mm above the ground plane and connected by the shorting plate at the edge of the patch and ground plane (fig.1). An extended V patch is added to get the lower frequency band. The main patch and extended patch is connected by a lumped element which represent the PIN diode which will work as a switch to achieve the reconfigurable state of the antenna (fig.2). After simulated, the antenna is fabricated (fig.3) and measured (fig.4). The figure 5 and 6 show that the antenna works fine at both 3.5GHz and 4.8GHz with simulated radiation pattern shows unidirectional pattern that mainly aimed at the top of the patch. The value for return loss at 3.5GHz resonant frequency is -39dB at 3.52GHz and for 4.8GHz resonant frequency is -40dB.

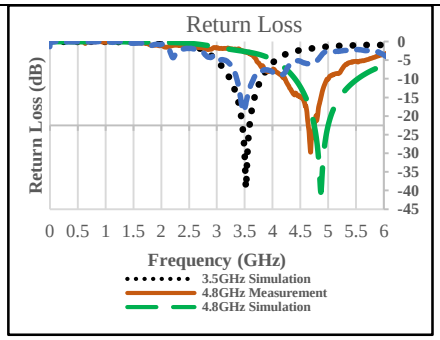


Fig. 4. Return Loss Result

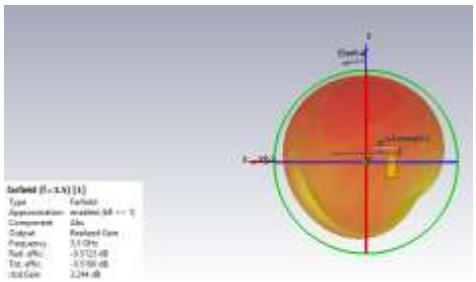


Fig. 5. Simulated Radiation Pattern in 3D at 3.5GHz

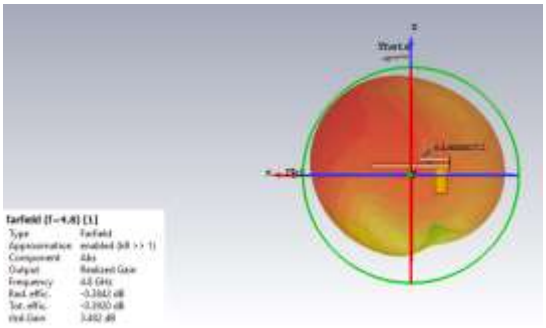


Fig. 6. Simulated Radiation Pattern in 3D at 4.8GHz

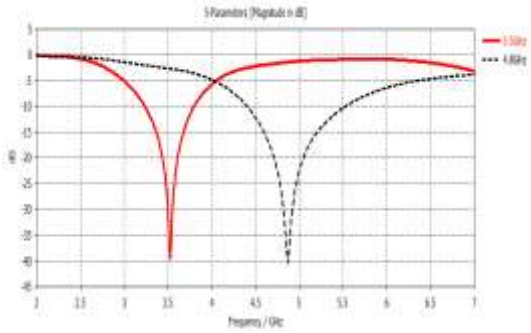


Fig. 7. Return Loss Result

FINAL PROJECT EESP

PROJECT TITLE : **IMPLEMENTATION OF POINT-TO-POINT WIRELESS BRIDGE IN WIRELESS AD HOC NETWORK COMMUNICATION SYSTEM USING MINI COMPUTER**

STUDENT NAME : **Muhammad Fikri Bill Gufran** REG. NO: **D41116506**

EXAM. YEAR : **2020**

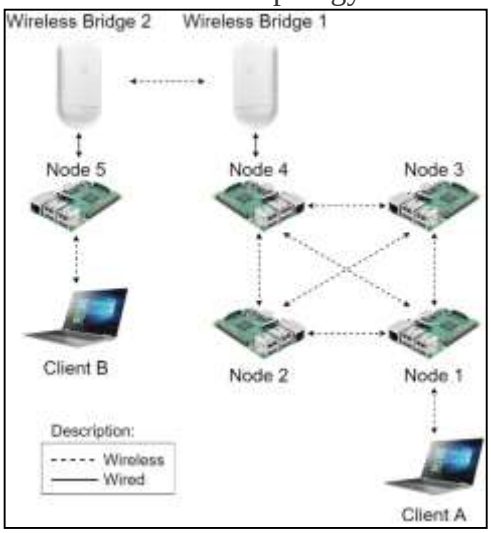
SUPERVISOR : **Prof. Dr. Ir. Andani Achmad** and **Dr. Eng. Wardi, S.T., M.Eng.**

DESIGN SPECIFICATION AND CONSTRAINT:

Wireless Network should give performance in terms of delay and throughput and achieve almost 100% packet delivery ratio.

ENGINEERING STANDARD:

The wireless communication is based on IEEE 802.11g at 2.4 GHz with bandwidth up to 54 Mbps.

Network topology  	The problem for wireless ad hoc network arises when the required coverage increases, specifically when there are no users in the specific area. Therefore, in this study point-to-point wireless bridges on ad hoc networks is implemented. Raspberry Pi 3 model B was used as ad hoc nodes with the routing protocol B.A.T.M.A.N Advanced, while NanoStation AC Loco was used as point-to-point wireless bridges use. The network consisted of five nodes, with four of nodes being ad hoc nodes. The wireless communication is based on IEEE 802.11g at 2.4 GHz with bandwidth up to 54 Mbps. The figure below, represent the the network performance in terms of delay and throughput. All testing scenarios achieved 100% packet delivery ratio.

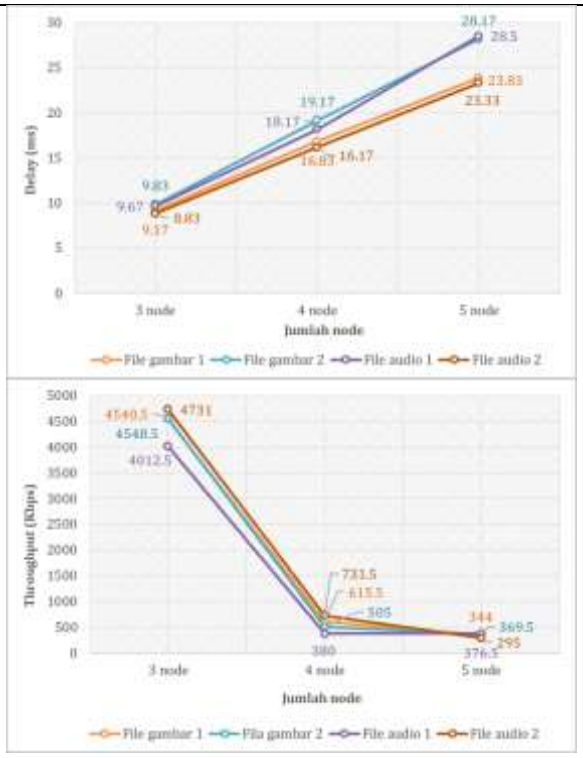


Figure 1: Network performance test results

FINAL PROJECT EESP

PROJECT TITLE : **MICROSTRIP ANTENNA DESIGN FOR A NON-INVASIVE GLUCOSE SENSOR**
STUDENT NAME : **MUTIAH RAYHANA**
REG. NO : **D41116518**
EXAM. YEAR : 2020
SUPERVISOR : **MERNA BAHARUDDIN, ST., M.Tel.Eng., Ph,D and Dr. Eng. Ir. DEWIANI, MT**

DESIGN SPECIFICATION AND CONSTRAINT:

The microstrip antenna design for this non-invasive glucose sensor is design on two substrate FR4 and NPC h220. The fabrication result of the designed antenna has resonant frequency -31.14 dB at frequency 2.17 GHz for FR4, and -42.23 dB at frequency 1.65 GHz for NPC H220.

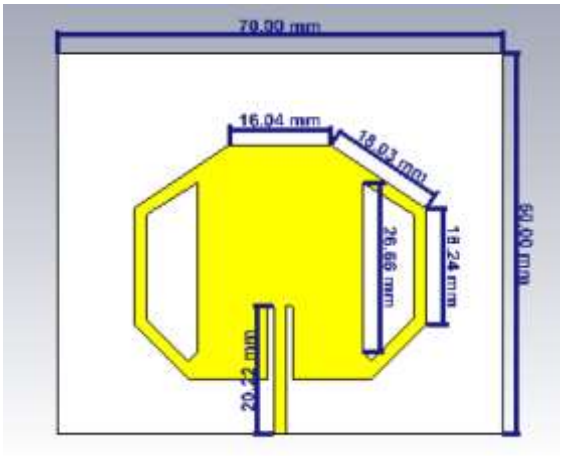


Fig. 1. Top structure of Microstrip Antenna

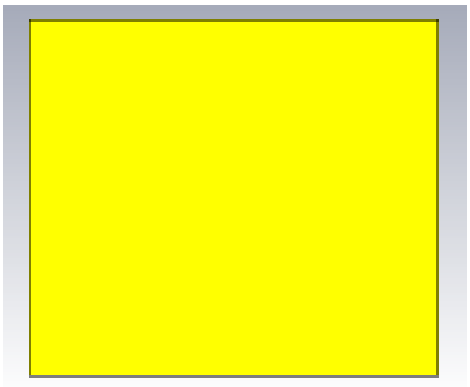


Fig. 2. Bottom structure of Microstrip Antenna

The design of microstrip antenna is used for to monitor glucose levels in human blood non-invasively. The background concept of this approach was blood glucose variation causes variations of blood permittivity accordingly. This blood permittivity will affect the resonant frequency of the microstrip antenna. Antenna design and simulation were performed using CST Microwave Studio software. The antenna is designed on FR4 ($\varepsilon r = 4.3$) dan NPC H220 ($\varepsilon r = 2.17$) substrate with h = 1.6mm. The proposed microstrip antenna is required to able to penetrate multiple layers of the body through the blood. An electromagnetic wave with a wavelength of 1 cm is necessary to reach up to the blood. Therefore, for our antenna, we choose around 1 to 2 GHz for the antenna working frequency. A patch of microstrip antenna placed on one side and ground plane on another side, (fig.1) and (fig. 2) shows the overall final dimension of the microstrip antenna design. Size of the substrate equal to the ground plane size, 60*70mm for FR4 and 70*80mm for NPC H220. Both are feed using feed line 50 Ω characteristic impedance, they are connected using SMA connector. The fabrication result of the designed antenna shows in (fig. 3) and (fig.4) and it can be observed return loss of FR4 is -31.14 dB at frequency 2.17 GHz, and

Fig. 3. Fabricated Microstrip Antenna FR4 Substrate

Fig. 4. Fabricated Microstrip Antenna NPC H220 Substrate

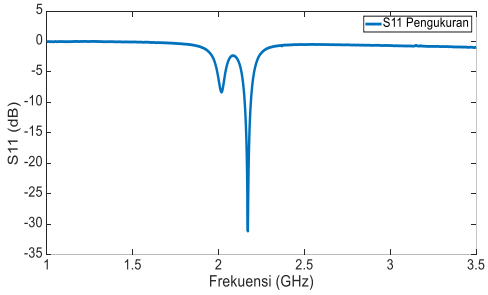


Fig. 5. Return loss of FR4 substrate antenna

NPC H220 is -42.23 dB at frequency 1.65 GHz.

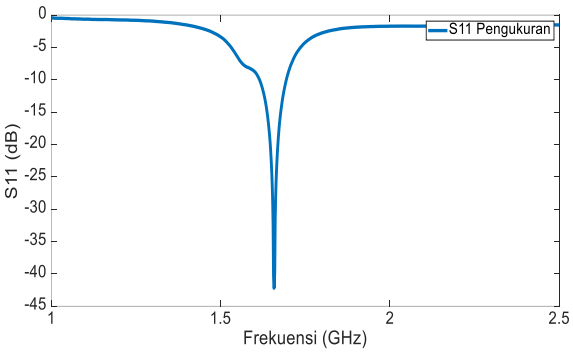


Fig. 6. Return loss of NPC H220 substrate antenna

Fig. 7. Proposed antenna placement for measurement

FINAL PROJECT EESP

PROJECT TITLE : **RANCANG BANGUN ANTENA MIMO UNTUK TEKNOLOGI 5G**
STUDENT NAME : **NITA AMELIA L** REG. NO: **D41116001**
EXAM. YEAR : 2020
SUPERVISOR : **DR.ENG. IR. DEWIANI, MT and ELYAS PALANTEI, ST, M.ENG. PhD**

DESIGN SPECIFICATION AND CONSTRAINT:
Antenna should work in the 4.8GHz frequency with the MIMO model i.e. having more than one receiver and sender, then the array is designed to increase the gain. The return loss value on each port must be -39dB.

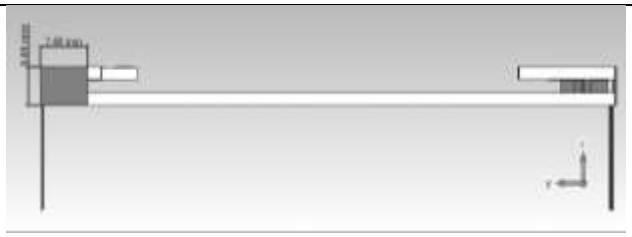


Fig. 1. Structure of Antenna MIMO

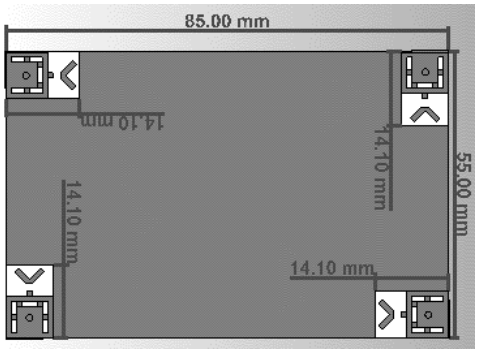


Fig. 2. Top View of Radiating Patch

Fig. 2. Back View of Array Path

MIMO technique is an antenna that has more than one receiver and sender, so it is suitable to be applied in 5G technology. Antenna array is made to increase the existing gain. The purpose of this design is to design a mimo array antenna that works in the 5G frequency band. The antenna is designed on FR4 substrate with h = 1.6mm and dielectric constant r = 4.3. The T-junction array antenna lines are arranged on top of the antenna substarate (fig. 1). For the current MIMO antenna array design, there is a position swap between the substrate and the groundplane. This exchange is done so that the antenna array path can be placed on the substrate. Between the top patch and the ground plane, there is an air gap with a dielectric constant εr = 1. Then to produce an antenna array, identical patch antennas are made with a total of 4 patch antennas placed at the ends of the ground and substrate. 2 patch antennas each arranged in an array which then produces 2 ports (fig. 2 and fig. 3). After simulating the mimo antenna, it will be fabricated (fig. 4) and each port is measured (fig. 5 and fig. 7). Figures 4 to 6 show that the mimo antenna works at a frequency of 4.8GHz with a return loss of -39dB on each port. Then in Figure 6 and Figure 8 show that the arrayed mimo antenna can increase the existing gain so that the gain produced by this mimo antenna is 5.592dB in port 1 and 5.688dB in port 2.

Fig. 4. Fabricated Antenna

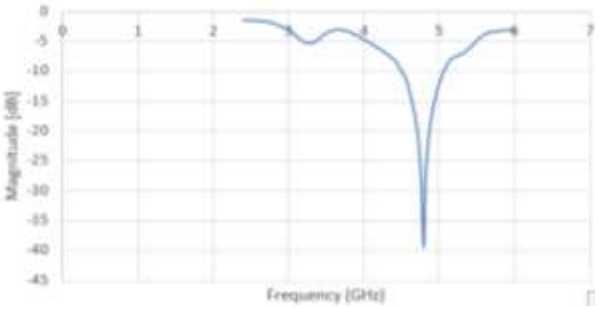


Fig. 5. Return Loss Result Port 1 (Measurement)

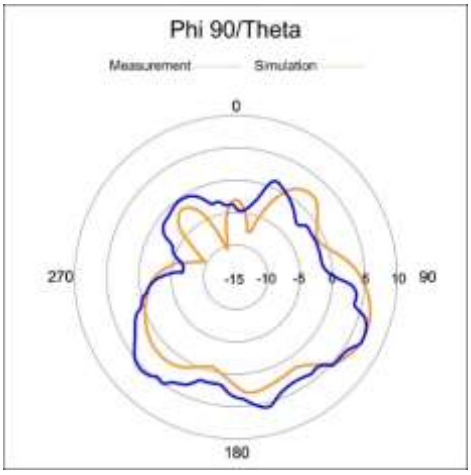


Fig. 6. Radiation Pattern Port 1

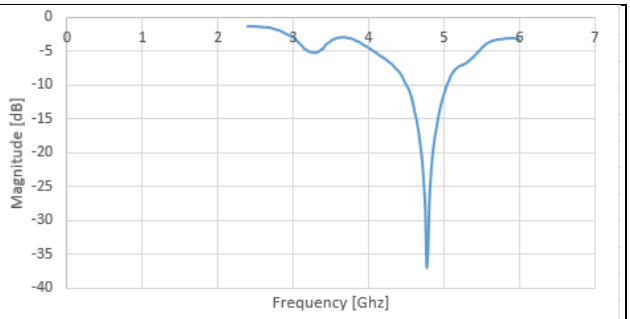


Fig. 7. Return Loss Result Port 2 (Measurement)

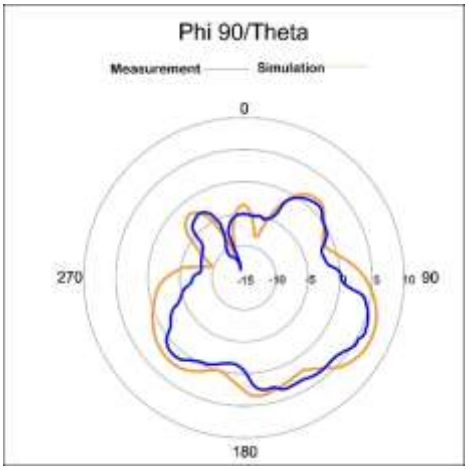


Fig. 8. Radiation Pattern Port 1

FINAL PROJECT EESP

PROJECT TITLE : **DESIGN AND CONSTRUCTION OF LINEAR GENERATOR FOR SEAWATER WAVE ENERGY CONVERSION**
STUDENT NAME : **AHMAD ASADUL KADAR** REG. NO: **D41116507**
EXAM. YEAR : 2021
SUPERVISOR : **Dr. INDAR CHAERAH GUNADIN, ST, MT and Ir. Hj. ZAENAB MUSLIMIN, MT**

DESIGN SPECIFICATION AND CONSTRAINT:

This permanent magnet linear generator design for seawater wave energy conversion is designed using NdFeB N35 magnets or commonly called Neodymium magnets. The greatest power generated from this linear generator is 0.475 VA with a rotor speed of 125 rpm, for the largest voltage generated is 3.6 V at a rotor speed of 125 rpm and for the largest current generated is 156.25 mA at a rotor speed of 125 rpm.

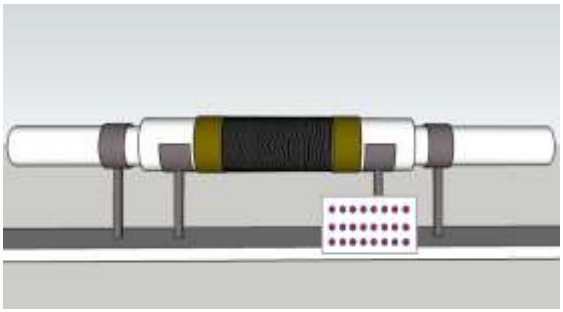


Fig. 1. Structure of Linear Generator

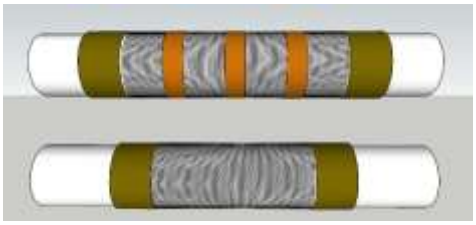


Fig. 2. Structure of Liniear Generator Stator

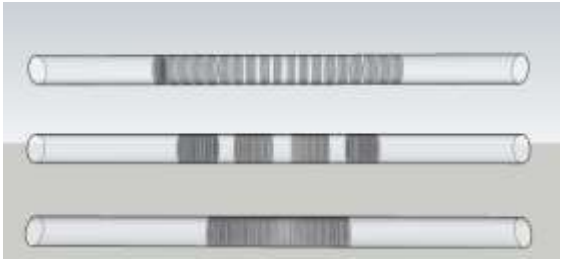


Fig. 3. Structure of Linear Generator Rotor

The design of this permanent magnet linear generator aims to create a power plant that utilizes ocean waves as the prime mover to generate electricity. The background of this design is that there are many renewable energy sources in Indonesia that are not fully utilized, for example, energy up and down from ocean waves. So a generator is made that utilizes the up and down motion (linear) of sea water waves (fig. 1). The design begins by making the stator of a linear generator from a PVC pipe with a length of 50 cm and wrapping the enamel wire around it by stacking it (fig.2), next is to make a rotor from an aluminum pipe with a length of 100 cm in which a Neodymium magnet has been arranged (fig.3). The final result when the stator and rotor of the linear generator have been put together and placed on the stand that has been made can be seen in Figure 4. Simulation of ocean waves is carried out by coupling the linear generator that has been made with a DL 1023PS 220V 11A motor. The largest voltage value (fig.5) is 3.6V at 125 rpm, the largest current value (fig.6) is 156.25 mA at 125 speed and the largest power value (fig.7) is 0.475 VA at speed 125 rpm.

Fig. 4. Permanent magnet Linear Generator

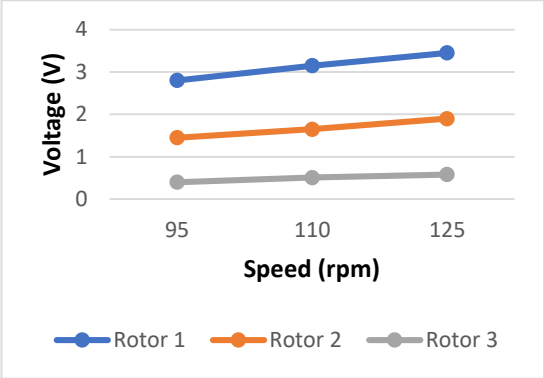


Fig. 5. Generated voltage by Linear Generator

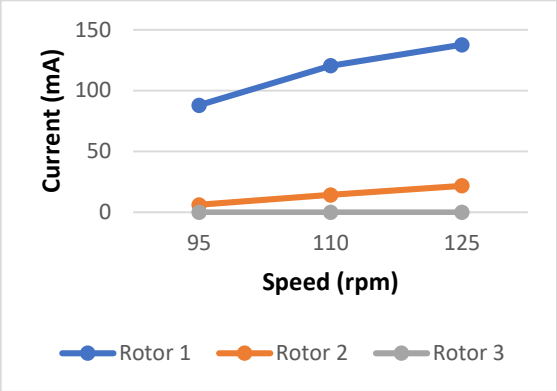


Fig. 6. Generated current by Linear Generator

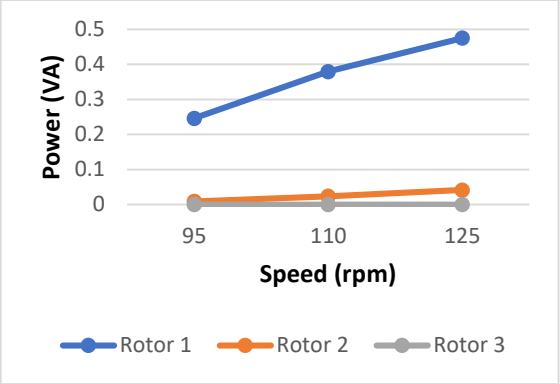


Fig. 7. Generated power by Linear Generator

FACILITIES

(Licenses for MATLAB and SPICE Circuit Simulator Software)

The EESP Response to ABET Statement #3:

3. Criterion 7. Facilities

This criterion requires that classrooms, offices, laboratories, and associated equipment must be adequate to support attainment of the student outcomes and to provide an atmosphere conducive to learning. Modern tools, equipment, computing resources, and laboratories appropriate to the program must be available, accessible, and systematically maintained and upgraded to enable students to attain the student outcomes and to support program needs. The program has facilities to support attainment of student's outcomes, but in some cases the number of students using the facility was large, such that each student may not receive the full benefit of the experience. In addition, the limited functionality of student versions of software for electrical circuit simulation, numerical computation and general office functions impeded the ability of students to fully attain the student outcomes. Without sufficient and appropriate equipment and software, student learning through hands-on laboratory experience may be inadequate. Thus, strength of compliance with this criterion is lacking.

30-Day Due-Process Response

The EAC acknowledges receipt of documentation detailing recent actions taken to address this shortcoming. The program has initiated procurement of a professional edition of a numerical simulation program and full version of an electric and electronic circuit simulator, as well as backup units of the lab equipment. No evidence was provided of the actual purchase and installation of the software and equipment. Thus, strength of compliance with this criterion is lacking.

Status

The program weakness is unresolved. In preparation for next review, the EAC anticipates translated documentation indicating that the software and equipment needed for students to attain the learning outcomes have been obtained.

The EESP Response:

We have purchased the requested software, i.e. MATLAB for numerical simulation and Cadence PSpice for electric and electronic circuit design and simulation. We have installed the software in some PCs in the EESP. The proofs of the software purchases for MATLAB and Cadence PSPICE are shown in the following appendices as well as the evidence of the software uses in any courses.

MATLAB: We have get recently the MATLAB license on June 25, 2021. We will use this software in all EESP courses that required MATLAB skills. In attachment, we show the confirmation letter of the license.

SPICE Circuit Simulator: In attachment we show the Invoice of SPICE license purchase. We shows also some student project reports (Basic Electronics and Power Electronics courses) that uses SPICE for circuit simulation.

TECHSOURCE
Dynamic Solutions Precise Results

Co. Reg. No.: 199603163W

Singapore, 25 June 2021

Subject: **MATLAB Software – New License Confirmation**

To **Dr. Wardi**

Thank you for purchasing MATLAB Software.

Your new MATLAB License Number are 41020268, 41020269, 41020270, 41020271, 41020272, 41020273, including Software Maintenance Service until 30 June 2022.

Your Mathworks Account is already created. Please check your email at wardi@unhas.ac.id for Mathworks Account login confirmation.

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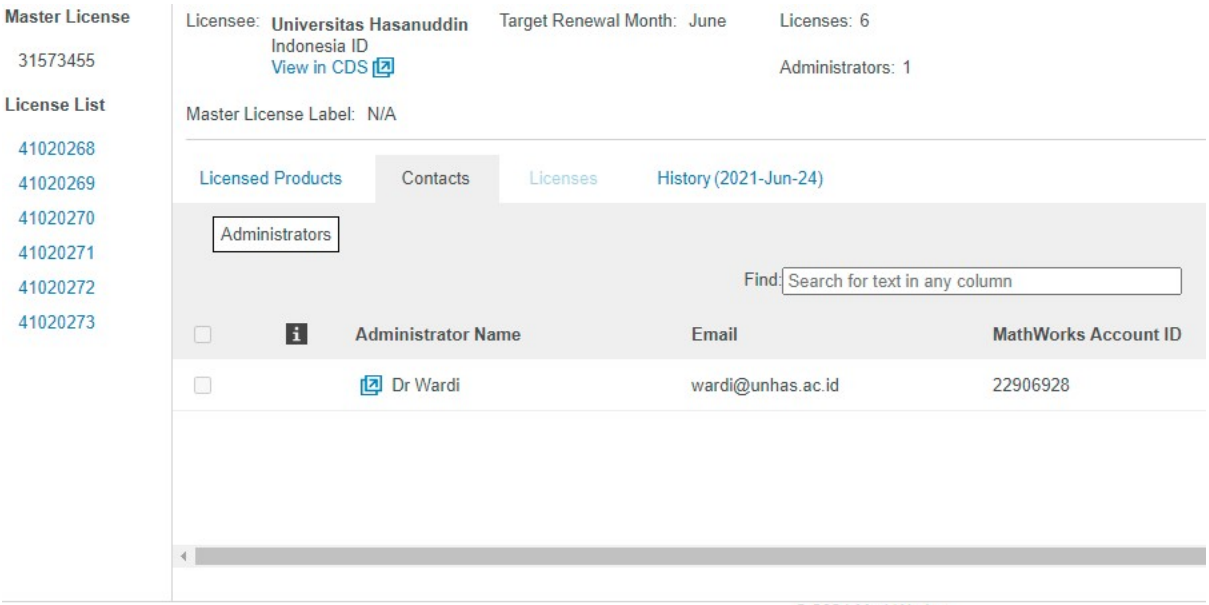

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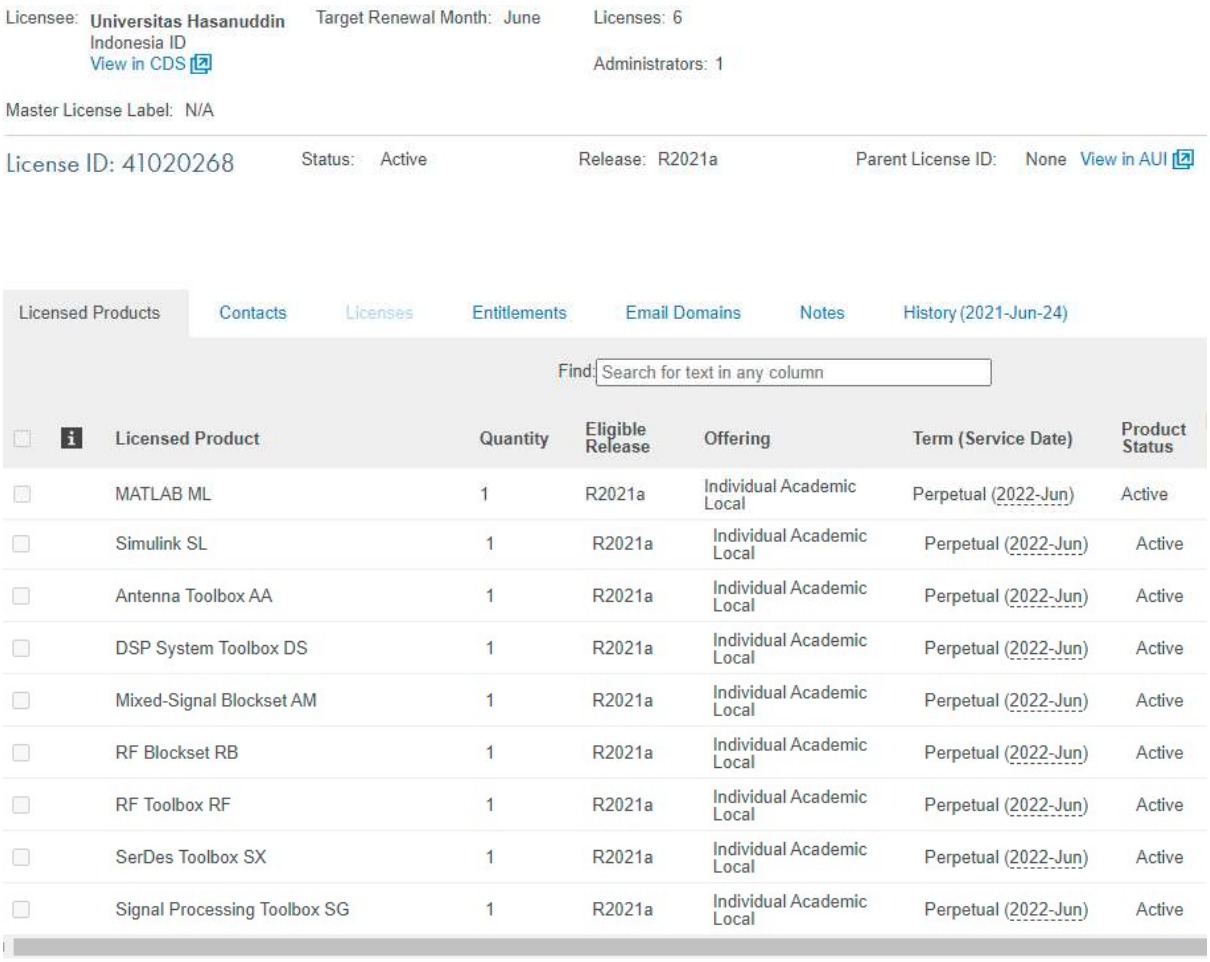

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Fuzzy Logic Toolbox FL	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Model Predictive Control Toolbox MP	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Motor Control Blockset MT	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Optimization Toolbox OP	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Robust Control Toolbox RC	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Simulink Control Design SD	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Simulink Design Optimization SO	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
System Identification Toolbox ID	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active

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Computer Vision Toolbox VP	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
DSP System Toolbox DS	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Image Processing Toolbox IP	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Lidar Toolbox LP	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Phased Array System Toolbox AR	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Signal Processing Toolbox SG	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Wavelet Toolbox WA	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active

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Communications Toolbox CM	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Deep Learning HDL Toolbox DH	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Deep Learning Toolbox NN	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
DSP System Toolbox DS	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Fixed-Point Designer PO	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
HDL Coder HD	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
HDL Verifier ES	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
MATLAB Coder ME	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Signal Processing Toolbox SG	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
SoC Blockset HW	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Vision HDL Toolbox VT	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Wireless HDL Toolbox LH	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active

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Communications Toolbox CM	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Deep Learning Toolbox NN	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
DSP System Toolbox DS	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
LTE Toolbox LS	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Predictive Maintenance Toolbox PM	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Sensor Fusion and Tracking Toolbox TF	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Signal Processing Toolbox SG	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Statistics and Machine Learning Toolbox ST	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
System Identification Toolbox ID	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
Text Analytics Toolbox TA	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
UAV Toolbox UV	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active
WLAN Toolbox WL	1	R2021a	Individual Academic Local	Perpetual (2022-Jun)	Active

PT BIRU REKSA TEKNOLOGI
Vila Regency II, Blok FD 5 no.23, Tangerang

Phone : 081387141035
Facsimile :
Email : bachr9@yahoo.com
birureksaonline@gmail.com

To :
DEPARTEMEN TEKNIK ELEKTRO, FAKULTAS TEKNIK
UNIVERSITAS HASANUDIN
Fakultas Teknik Kampus GOWA
Jl.Poros Malino Km 6, Borongloe 92171,Kabupaten Gowa
Sulawesi Selatan
Attn : Finance Department

INVOICE

INVOICE NUMBER	009/TGH/BRT/XI/2020
PAGE	DATE: 20 Nopember 2020

REFERENCE	CONTRACT/PO/WO NO	PAYMENT TERMS	CURRENCY
Tagihan Pengadaan Software SW Cadence	848/UN4.7.7/KU.00.01/2020		

NO	DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL PRICE
	Tagihan Pangadaan Software SW Cadence			
1	Software SW Cadence a.OrCad capture b.OrCad PSB Designer c.OrCad PSpice Designer d.OrCad PCB PSI	1 unit	95.000.000	95.000.000,00
				95.000.000,00
			Sub Total	95.000.000,00

TOTAL	95.000.000,00
TAX (PPN 10%)	9.500.000,00
TOTAL VALUE	104.500.000,00
Dibulatkan :	104.500.000,00

SAY IN WORD :
Seratus Empat Juta Lima Ratus Ribu Rupiah

PAYMENT TO BE MADE TO :
Attention : PT Biru Reksa Teknologi
Account No. : **No. Rekening 164-000-323225-5**
Bank : Mandiri
Cabang ITC BSD Tangerang Selatan

Yours Truly,
PT Biru Reksa teknologi

Bachrun Rangkudy
Direktur

Capaian pembelajaran praktikum:

Mahasiswa mahir menggunakan Software Cadence OrCAD PSpice untuk mensimulasikan program SPICE; merancang program SPICE untuk setiap rangkaian elektronika yang diberikan; serta merancang rangkaian elektronika untuk setiap program SPICE yang diberikan.

MODUL 1 Pengenalan Program Spice (Versi Cadence Orcad)

NAMA MHS :	AULIA ADISTY WIDYA SAFIRA	KRITERIA PENILAIAN:	NILAI:
		Kedisiplinan dan Kejujuran :	.....
NIM :	D041191065	Kreativitas dan Ketelitian :	.....
		Penguasaan Materi :	.....
		Kemampuan Menjawab Soal :	.....
		TOTAL NILAI:	.....

INSTRUKSI: Ikutilah Langkah-langkah yang ditunjukkan pada Modul 1 Buku Penuntun Praktikum Elektronika Daya, lalu sisipkanlah hasil-hasil simulasi ke dalam lembar kerja di bawah ini. Anda juga bebas mengubah nilai-nilai parameter di dalam program Spice.

Program Spice:

```
00 Rangkaian Simulasi Tanggapan Filter
01 VS 1 0 PULSE (0 220 1US 10MS 20MS)
02 VSENS 1 2 0
03 L1 2 3 1MH
04 L2 3 4 12 mH
05 CF 3 5 12 0UF
06 RD 5 0 1.2
07 RL 4 0 1K
08 .TRAN 1US 100MS 0 1US
09 .FOUR 50Hz 100 V(4,0) I (RL)
10. PROBE V(1,0) I(VSENS) V (4,0) I (RL)
11. END
```

Hasil Simulasi SPICE (Teks Output Simulasi)

```
056 **** 12/05/20 21:32:20 **** PSPICE LITE (MARCH 2016)
057 RANGKAIAN SIMULASI TANGGAPAN FILTER
058
059
060
061 *** FOURIER ANALYSIS TEMPERATURE = 27.000 DEG C
062
063
064 *** ********** ********** **********
065
066
067
068 FOURIER COMPONENTS OF TRANSIENT RESPONSE V (4,0)
```

DC COMPONENT = 1.1001E+02

HARMONIC NO	FREQUENCY (HZ)	FOURIER COMPONENT	NORMALIZED COMPONENT	PHASE (DEG)	NORMALIZED PHASE (DEG)
1	5.000E+01	1.4173E+02	1.000E+00	-2.9130E-01	0.0000E+00
2	1.000E+02	2.9083E-01	2.0520E-03	8.9218E+01	8.9804E+01
3	1.500E+02	5.2131E+02	3.6782E-01	-1.7008E+00	-8.2147E-01
4	2.000E+02	3.3911E-01	2.3926E-03	8.6606E+01	8.7719E+01
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.
100	5.000E+03	1.0212E-03	7.2055E-06	-3.3672E+01	4.3614E+00

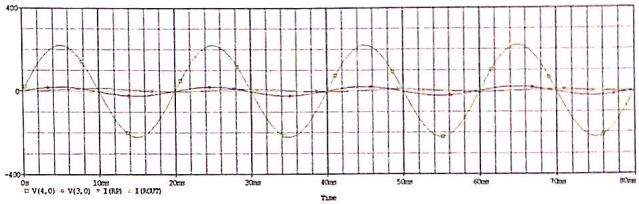
TOTAL HARMONIC DISTORTION = 6.3592E+01 PERCENT

Jawaban Pertanyaan Tugas Mandiri:

1. Belum sesuai Program yang sesuai ada pada halaman selanjutnya hal 03 " Program Spice "

3. Instruksi Sin (0 220 50 0 0 0) adalah bentuk gelombang Sinusoidal dengan amplitudo 220 V dan frekuensi 50 Hz
(Vo Va Fr Td Df θ)
   - Vo : nilai terendah (volt)
   - Va : nilai amplitudo (volt)
   - Fr : Frekuensi (Hz)
   - Td : waktu tunda (s)
   - Df : faktor redaman (1/s)
   - θ : sudut fasa (°)

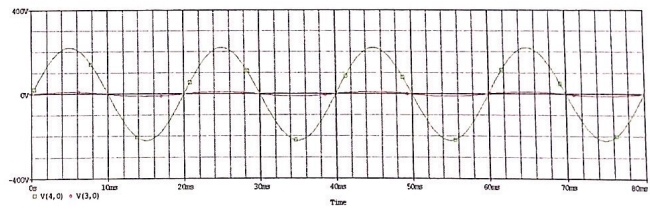
4. Simulasi spice sesuai instruksi · PROBE



5. Trafo step down, karena $L_1 > L_2$

6. · Untuk trafo step up maka diatur $L_2 > L_1$, misalnya L_1 : 10 mH, L_2 : 20 mH
   · Untuk trafo step down $L_1 > L_2$, misalnya L_1 : 20 mH, L_2 : 5 mH

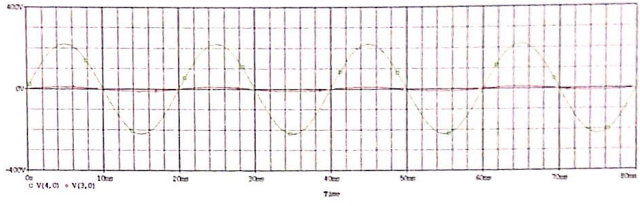
7.



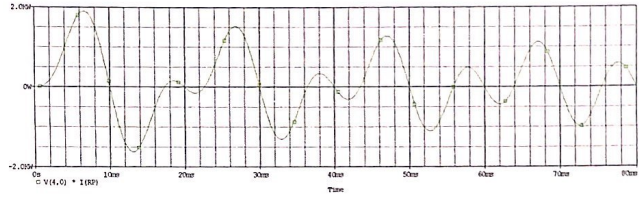
km : 0,5

Maka gelombang sinus yg terbentuk pada grafik V(3,0) memiliki amplitudo yang kecil, sehingga mendekati garis lurus terhadap waktu.

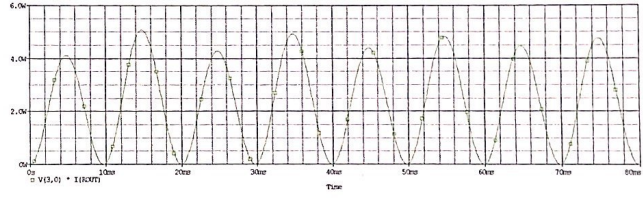
Daya masukan



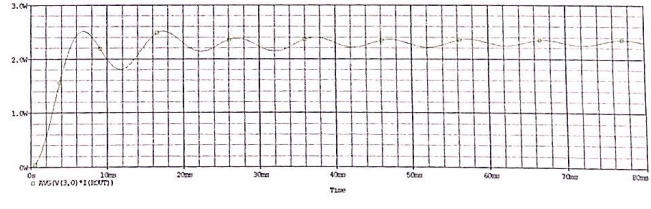
Rata Rata Daya Masukan



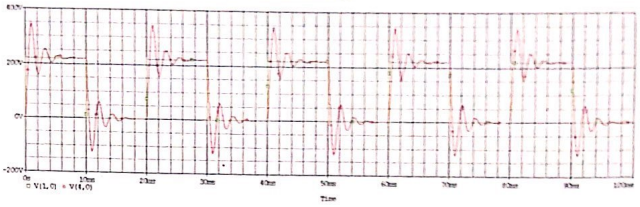
Daya Keluaran



Rata Rata Daya Keluaran

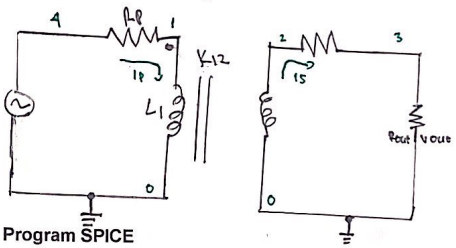


Hasil Simulasi SPICE (Waveform)



Tugas Mandiri: Rangkaian Trafo

Gambar Skematika Rangkaian

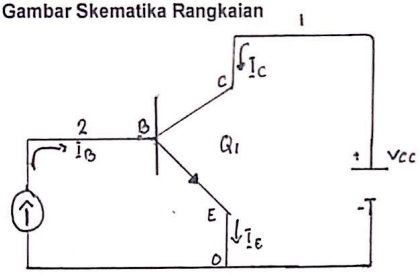


Program SPICE

```
00 Rangkaian TRAFO Sederhana
01 VIN 4 0 SIN 0 220 50 0 0 0
02 RP  4 1 2
03 L1  1 0 100 mH
04 L2  2 0 1mH
05 K12 L1 L2 1.0
06 RC  2 3 2
07 ROUT 3 0 100
08 .TRAN 0 1ms 80ms 0 0 1ms
09 .PROBE V( , ) V( , ) I(RP) I(ROUT)
10 .END
```

Tugas Mandiri: Rangkaian Uji Karakteristik BJT

Gambar Skematika Rangkaian



Program SPICE

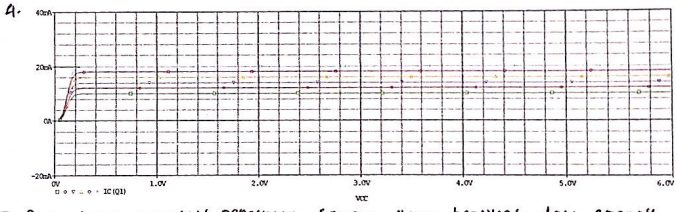
```
00 Rangkaian transistor Bipolar NPN
01 VCC 1 0 5
02 IB 0 2 {IBB}
03 .PARAM IBB = 200 MA
04 Q1 1 2 0 Q MODEL
05 .MODEL Q MODEL NPN (IS=5E-14 BF = 100)
06 .STEP PARAM IBB
07 .DC VCC
08 .PRINT DC V (1,0) IC (Q1)
09 .PROBE
10. END
```

Jawaban Pertanyaan Tugas Mandiri:

1. Makna tuliskan baris 3 dan 4
   3 -> deklarasi IB pada node (0,2) dimana IB merupakan sumber arus. {IBB} menyatakan besar nilai dari IBB
   4 -> menunjukkan besar IBB = 200 μA

2. Arti tuliskan baris 5 dan 6
   5 => menunjukkan transistor Q1 di node 120 dengan perintah
   Q MODEL -> menunjukkan parameter transistor
   6 => MODEL sebagai parameter untuk menunjukkan adanya transistor NPN atau menunjukkan karakteristik dari transistor NPN dengan IS = 5e-14 dan B = 100

3. 7 -> menunjukkan nilai dari IBB dari 100 - 200 dengan rentang 20 μA. Jadi parameter IBB ada 6 yaitu 100 μA, 120 μA, 140 μA, 160 μA, 180 μA, dan 200μA

4. 

5. Dari hasil simulasi rangkaian, seperti yang terlihat dari grafik di atas, bahwa grafik tersebut menunjukkan karakteristik dari transistor NPN sesuai dengan parameter yang ditentukan. Daerah yg berwarna merupakan wilayah aktif dari transistor, sedangkan daerah yang dibawah grafik nisca merupakan wilayah cut OFF. sedangkan daerah sebelah kiri menunjukkan wilayah saturasi / jenuh.

6. Jika parameter diubah pada baris
   7 -> maka kurva yang dihasilkan berbeda. Misal, diubah step param IBB 100 μA 200 μA 20 μA maka hanya ada 2
   8 -> maka koordinat x akan berubah. Misal. DC VCC 1 5 0.02 maka Vcc pada grafik dalam hal ini x akan mulai dari 1

LEMBAR KERJA MODUL (LKM) PRAKTIKUM DASAR ELEKTRONIKA (202D4101)

MODUL 4 Aplikasi Op-Amp

Capaian pembelajaran praktikum:

Mahasiswa menjelaskan model rangkaian penguat operasional, serta mampu menjelaskan, merancang dan menganalisis rangkaian aplikasi penguat operasional seperti rangkaian penjumlah, pembanding, filter aktif, dsb.g diberikan.

NAMA MHS : NUR IQRIMA FITRAH QALBY

NIM : D041191068

KRITERIA PENILAIAN:	NILAI:
Kedisiplinan dan Kejujuran :	.....
Kreativitas dan Ketelitian :	.....
Penguasaan Materi :	.....
Kemampuan Menjawab Soal :	.....
TOTAL NILAI:	.....

INSTRUKSI: Ikutilah Langkah-langkah yang ditunjukkan pada Modul 4 Buku Penuntun Praktikum Elektronika Daya, lalu sisipkanlah hasil-hasil simulasi ke dalam lembar kerja di bawah ini.

Jawaban Soal-soal Teori Dasar:

(1) (a) Rangkaian Op-Amp 1:

$$V_{out} = -\left(\frac{V_{IN1}}{R_1} + \frac{V_{IN2}}{R_2} + \frac{V_{IN3}}{R_3}\right) \cdot R_F$$

(b) Rangkaian Op-Amp 2:

1. Ketika $V_{in2} = 0$

$$V_{out1} = \left(\frac{R_2}{R_1} + 1\right) \cdot V_{IN1}$$

2. Ketika $V_{in1} = 0$

$$V_{out2} = -\left(\frac{R_2}{R_1}\right) V_{IN2}$$

3. Jumlahkan Menjadi $V_{tot} = V_{out1} + V_{out2}$

$$V_{tot} = \left(\frac{R_2}{R_1} + 1\right) \cdot V_{IN1} - \left(\frac{R_2}{R_1}\right) V_{IN2}$$

$$V_{tot} = \frac{R_2}{R_1}(V_{IN1} - V_{IN2}) + V_{IN2}$$

(c) Rangkaian Op-Amp 3:

1. Ketika $V_{in2} = 0$

$$V_{out1} = \left(\frac{R_2}{R_1} + 1\right) \cdot V_{IN1} \left(\frac{R_2}{R_1 + R_2}\right)$$

2. Ketika $V_{in1} = 0$

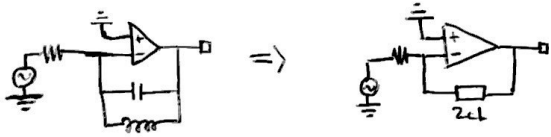
$$V_{out2} = -\left(\frac{R_2}{R_1} + 1\right) V_{IN2}$$

3. Jumlahkan Menjadi $V_{tot} \equiv V_{out1} + V_{out2}$

$$V_{tot} = \left(\frac{R_2}{R_1} + 1\right) \cdot V_{IN} \left(\frac{R_2}{R_1 + R_2}\right) - \left(\frac{R_2}{R_1} + 1\right) V_{IN2}$$

$$= \left(\frac{R_2}{R_1} + 1\right) \left(\frac{R_2}{R_1 + R_2}\right) V_{IN1} - \left(\frac{R_2}{R_1} + 1\right) V_{IN2}$$

(d) Rangkaian Op-Amp 4:



$$Z_{cL} = (Z_c // Z_L)$$

$$Z_{cL} = \frac{\omega}{j(\omega^2 LC + 1)} \Rightarrow V_{out} = -\frac{V_{in}}{2R} \left(\frac{\omega}{j(\omega^2 LC + 1)}\right)$$

(e) Rangkaian Op-Amp 5:

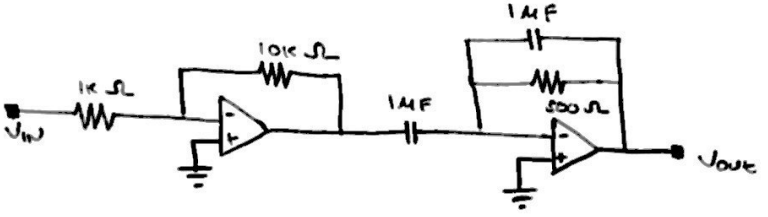
$$Z_{cL} = (Z_c // Z_L) \Rightarrow Z_{cL} = \frac{\omega}{j(\omega^2 LC + 1)}$$

$$Z_{RL} = (Z_R + Z_L) \Rightarrow Z_{RL} = R + j\omega L$$

$$V_{out} = \frac{V_{in}}{R + j\omega L} \cdot \left(\frac{\omega}{j(\omega^2 LC + 1)}\right)$$

(2) Susunlah rangkaian penguat operasional sehingga terbentuk fungsi alih sebagai berikut:

(a) $\frac{V_{OUT}(s)}{V_{IN}(s)} = \frac{10s}{s+2000}$



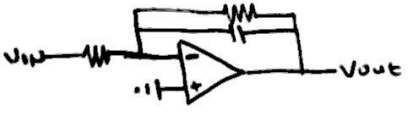
(b) $\frac{V_{OUT}(s)}{V_{IN}(s)} = -\frac{100}{s+1500}$

$V_{out} \cdot S + 1500 = -V_{IN}(100)$

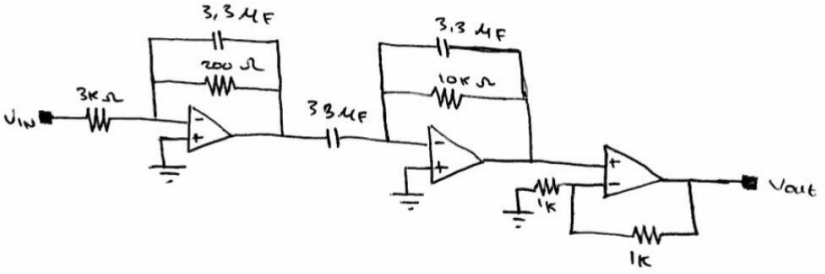
$Sv_{out} + 1500 V_{out} = -100 V_{IN} \mid :100$

$\frac{Sv_{out}}{100} + \frac{1500 V_{out}}{100} = -V_{IN}$

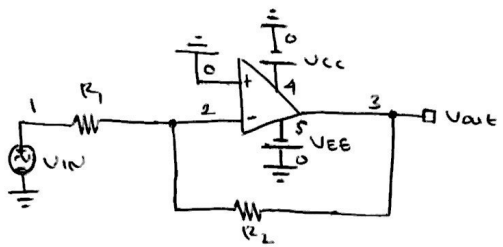
$I_C + I_{R2} = I_{R1}$



(C) $\frac{V_{OUT}(s)}{V_{IN}(s)} = (\frac{100}{s+1500})(\frac{200s}{10s+300})$



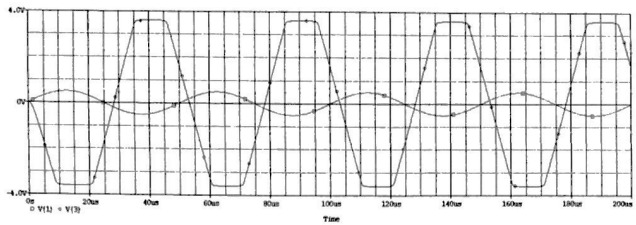
Gambar Rangkaian Penguat Tegangan Membalik dengan Label pada tiap Simpul:

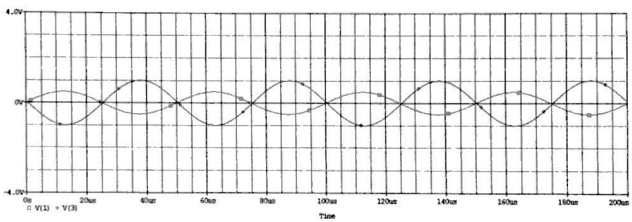


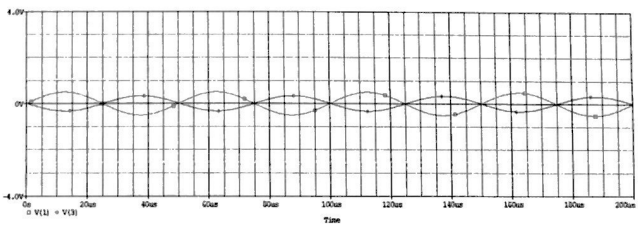
Program Spice Rangkaian Penguat Tegangan Membalik Op-Amp:

```
Rangkaian Op-Amp Penguat Membalik
.PARAM RFB = 100K
.PARAM VPOS = 9V
.PARAM VNEG = {VPOS}
Vcc 4 0 {VPOS}
VEE 0 5 {VNEG}
VIN 1 0 SIN (0 500m 20K 0 0 0)
R1 1 2 10K
R2 2 3 {RFB}
XOPAMP 0 2 4 5 3 UA741
.LIB EVAL.LIB
.TRAN 0,01m 0,2m 0 0,0001m
.PROBE V(1) V(3) V(2,0)
.END
```

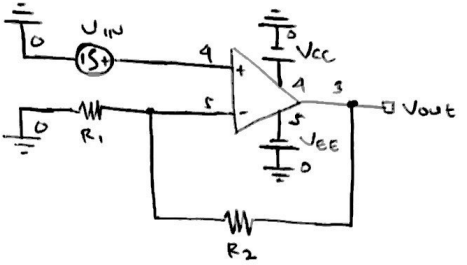
Hasil Simulasi Rangkaian Penguat Tegangan Membalik (Waveform)







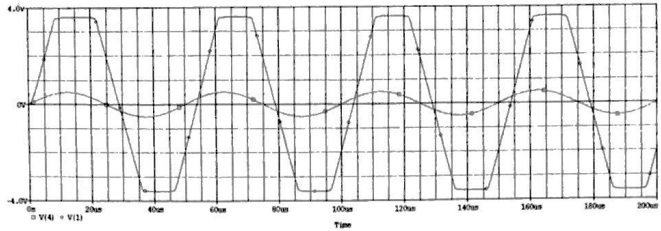
Gambar Rangkaian Rangkaian Penguat Tegangan Tak-Membalik:

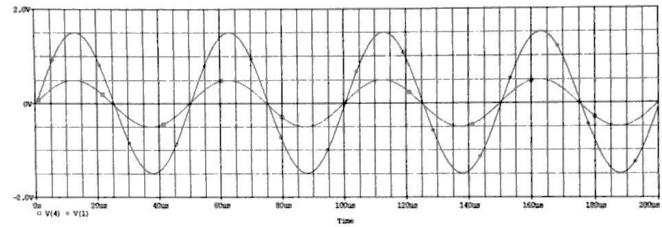


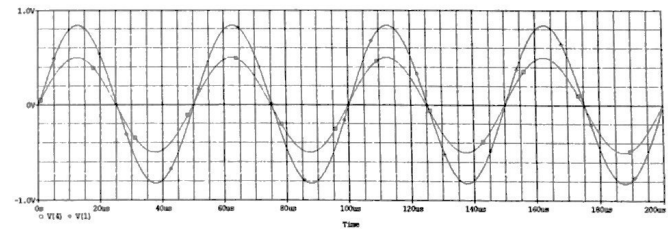
Program Spice Rangkaian Rangkaian Penguat Tegangan Tak-Membalik:

```
Rangkaian Penguat Tegangan Tak-Membalik
.PARAM RFB = 100K
.PARAM RIB = 10K
.PARAM VPOS = 4V
.PARAM VNEG = {VPOS}
VCC 3 0 {VPOS}
VEE 0 2 {VNEG}
VIN 4 0 SIN(0 500m 20K 0 0 0)
R1 5 0 {RIB}
R2 5 1 {RFB}
XOPAMP 4 5 3 2 1 UA741
.LIB EVAL.LIB
.TRAN 0,01m 0,2m 0 0,0001m
.PROBE V(4) V(1)
.END
```

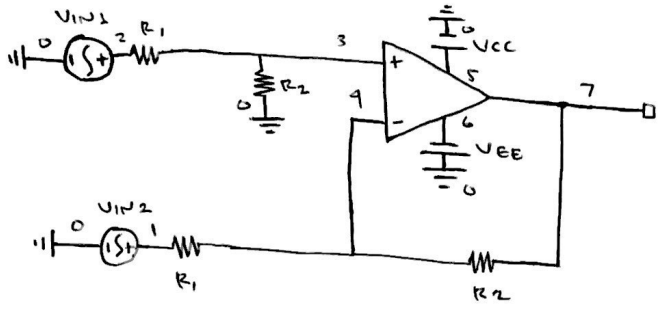
Hasil Simulasi Rangkaian Rangkaian Penguat Tegangan Tak-Membalik (Waveform)







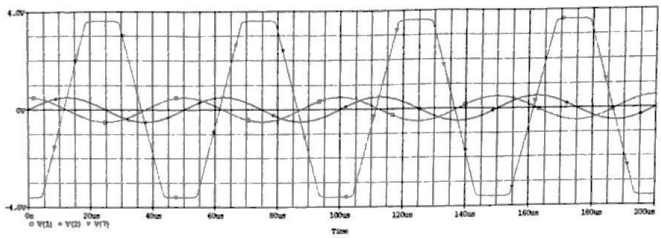
Gambar Rangkaian Penguat Tegangan Selisih:

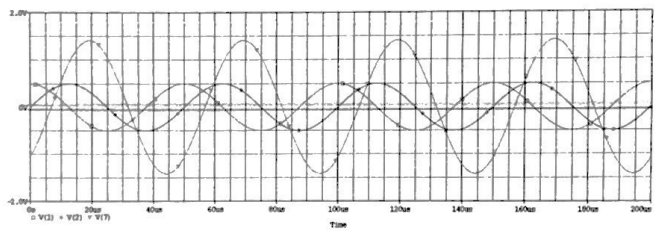


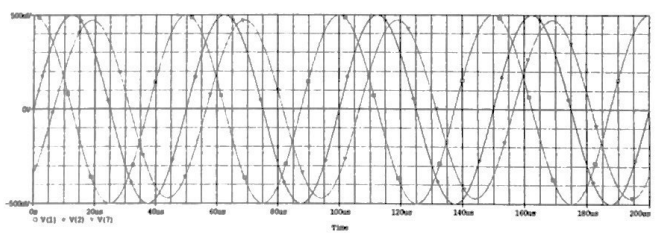
Program Spice Rangkaian Penguat Tegangan Selisih:

```
Rangkaian Penguat Tegangan Selisih
.PARAM RFB = 100K
.PARAM RIN = 10K
.PARAM VPOS = 9V
.PARAM VNEG = {VPOS}
Vcc 5 0 {VPOS}
VEE 0 6 {VNEG}
VIN1 2 0 SIN (0 500m 20K 0 0 0)
VIN2 1 0 SIN (0 500m 20K 0 0 90)
R1a 3 2 {RIN}
R2a 3 0 {RFB}
R1b 4 1 {RIN}
R2b 4 7 {RFB}
XOPAMP 3 4 5 6 7 UA741
.TRAN 0.01m 0.2m 0 0.0001m
.PROBE V(7) V(1) V(2)
.END
```

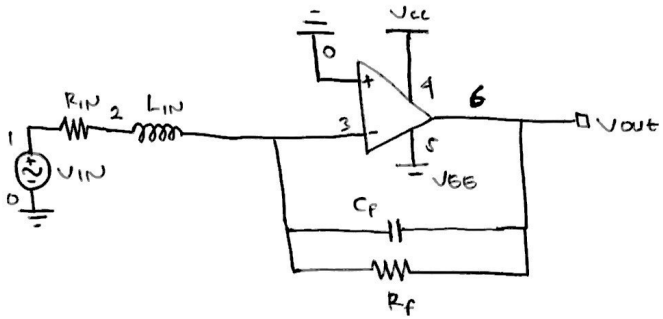
Hasil Simulasi Rangkaian Penguat Tegangan Selisih (Waveform)







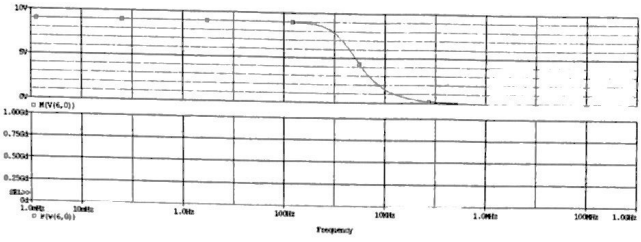
Gambar Rangkaian Penapis Pelewat Rendah (Low-Pass Filter):



Program Spice Rangkaian Penapis Pelewat Rendah (Low-Pass Filter):

```
Rangkaian Op-Amp Penapis Frekuensi Rendah
* PARAM VPOS = 10V
* PARAM VNEG = {VPOS}
* PARAM FREQ = 10kHz
VCC 4 0 {VPOS}
VEE 0 5 {VNEG}
VIN 1 0 AC 1.0
RIN 1 2 10K
LIN 2 3 10mH
RF 3 6 90K
CF 3 6 1nF
XOPAMP 0 3 4 5 6 UA741
* LIB EVAL.LIB
* AC DEC 100 0.001Hz 1000MEGHz
* PROBE V(1,0) V(6,0)
* END
```

Hasil Simulasi Rangkaian Penapis Pelewat Rendah (Low-Pass Filter) (Waveform)



SIMPULAN

1) Op-Amp dapat digunakan sebagai penguat dan pengindra masukan sinyal DC atau AC serta menguatkan differensiasi impedansi. Op-Amp dari segi aplikasi diterapkan dalam perangkat elektronik sebagai sensor, pengeras suara / sinyal, dan integrasi sinyal
2) Jenis rangkaian penguat antara lain penguat pembalik, penguat tak pembalik, penguatan pembagi tegangan, penguat penjumlahan,
3) Jenis rangkaian perapis antara lain lowpass filter, high pass filter, band pass filter, dan band stop filter. Low pass filter meloloskan frekuensi rendah dan mengeliminasi frekuensi tinggi, High Pass filter mengeliminasi frekuensi rendah dan melewatkan frekuensi tinggi. Band pass filter melewatkan frekuensi diatas dan dibawah daerah cutoff. Band stop filter melewatkan frekuensi dibawah dan diatas daerah cut-off
4) Perbedaan mendasar dalam merancang rangkaian penguat tegangan dan rangkaian perapis terutama jika ditinjau dari komponen penyusunnya adalah rangkaian penguat hanya terdiri atas resistor sedangkan rangkaian perapis tersusun atas komponen resistor, induktor dan kapasitor

Tujuan praktikum:

(1) Praktikan/mahasiswa mampu mengenal dan memahami fungsi dari piranti Thyristor SCR (*Silicon Controlled Rectifier*) dalam rangkaian elektronika daya

(2) Praktikan/mahasiswa mampu menjelaskan prinsip kerja rangkaian penyearah berbasis Thyristor SCR.

MODUL 3 Penyearah Berbasis SCR

NAMA MHS :	**Ahmad Nur Fajar Arifai**	**KRITERIA PENILAIAN:**	**NILAI:**
		Kedisiplinan dan Kejujuran :	.....
NIM :	**D041181017**	Kreativitas dan Ketelitian :	.....
		Penguasaan Materi :	.....
		Kemampuan Menjawab Soal :	.....
		TOTAL NILAI:	.....

INSTRUKSI: Ikutilah Langkah-langkah yang ditunjukkan pada Modul 3 Buku Penuntun Praktikum Elektronika Daya, lalu sisipkanlah hasil-hasil simulasi ke dalam Lembar Kerja Praktikum (LKM) ini.

Jawaban Soal-soal Teori Dasar:

(1) Rectifier atau dalam bahasa Indonesia disebut dengan Penyearah Gelombang adalah suatu bagian dari Rangkaian Catu Daya atau Power Supply yang berfungsi sebagai pengubah sinyal AC (Alternating Current) menjadi sinyal DC (Direct Current). Rangkaian Rectifier atau Penyearah Gelombang ini pada umumnya menggunakan Dioda sebagai Komponen Utamanya. Hal ini dikarenakan Dioda memiliki karakteristik yang hanya melewatkan arus listrik ke satu arah dan menghambat arus listrik dari arah sebaliknya. Jika sebuah Dioda dialiri arus Bolak-balik (AC), maka Dioda tersebut hanya akan melewatkan setengah gelombang, sedangkan setengah gelombangnya lagi diblokir.

(2) a. pada catu daya perangkat elektronik seperti laptop, computer, dll. Penggunaan 220V AC sebagai standar membuat beberapa peralatan elektronik DC membutuhkan rangkaian penyearah untuk menyuplai daya.

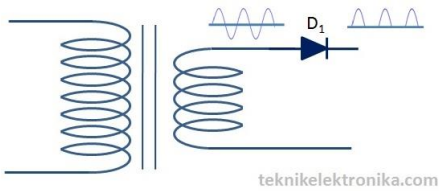
b. pada rangkaian charger AKI atau baterai. Untuk mencharger sebauh baterai dibutuhkan rangkaian penyearah untuk menyearahkan arus bolak balik dari PLN.

c. pada pengendali kecepatan motor DC, dengan mengatur tegangan output dari rangkaian penyerah daya dapat digunakan sebgai controller kecepatan maupun arah putar motor DC.

(3) Pada dasarnya, Rectifier atau Penyearah Gelombang dibagi menjadi dua jenis yaitu Half Wave Rectifier (Penyearah Setengah Gelombang) dan Full Wave Rectifier (Penyearah Gelombang Penuh).

- Penyearah setengah gelombang

Penyearah Setengah Gelombang
(Half Wave Rectifier)



Pada prinsipnya, arus AC terdiri dari 2 sisi gelombang yakni sisi positif dan sisi negatif yang bolak-balik. Sisi Positif gelombang dari arus AC yang masuk ke Dioda akan menyebabkan Dioda menjadi bias maju (Forward Bias) sehingga melewatkannya, sedangkan sisi Negatif gelombang arus AC yang masuk akan menjadikan Dioda dalam posisi Reverse Bias (Bias Terbalik) sehingga menghambat sinyal negatif tersebut.

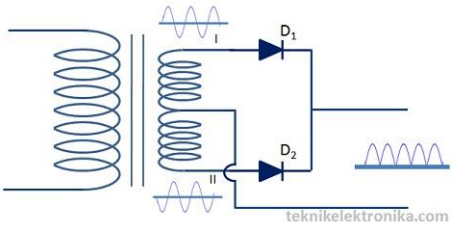
- Penyearah gelombang penuh

Terdapat 2 cara untuk membentuk Full Wave Rectifier atau Penyearah Gelombang Penuh. Kedua cara tersebut tetap menggunakan Dioda sebagai Penyearahnya namun dengan jumlah Dioda yang berbeda yaitu dengan menggunakan 2 Dioda dan 4 Dioda. Penyearah Gelombang Penuh dengan 2 Dioda harus menggunakan Transformer CT sedangkan Penyearah 4 Dioda tidak perlu menggunakan Transformer CT, Penyearah 4 Dioda sering disebut juga dengan Full Wave Bridge Rectifier.

A. Penyearah Gelombang Penuh 2 Dioda

Seperti yang dikatakan diatas, Penyearah Gelombong Penuh 2 Dioda memerlukan Transformer khusus yang dinamakan dengan Transformer CT (Centre Tapped). Transformer CT memberikan Output (Keluaran) Tegangan yang berbeda fasa 180° melalui kedua Terminal Output Sekundernya. Perbedaan Fase 180° tersebut dapat dilihat seperti pada gambar dibawah ini :

Penyearah Gelombang Penuh 2 Dioda
(Full Wave Rectifier)



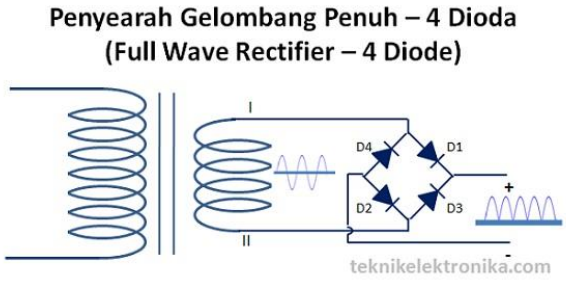
Di saat Output Transformer CT pada Terminal Pertama memberikan sinyal Positif pada D1, maka Terminal kedua pada Transformer CT akan memberikan sinyal Negatif (-) yang berbeda fasa 180° dengan Terminal Pertama. D1 yang

mendapatkan sinyal Positif (+) akan berada dalam kondisi Forward Bias (Bias Maju) dan melewatkan sisi sinyal Positif (+) tersebut sedangkan D2 yang mendapatkan sinyal Negatif (-) akan berada dalam kondisi Reverse Bias (Bias Terbalik) sehingga menghambat sisi sinyal Negatifnya.

Sebaliknya, pada saat gelombang AC pada Terminal Pertama berubah menjadi sinyal Negatif maka D1 akan berada dalam kondisi Reverse Bias dan menghambatnya. Terminal Kedua yang berbeda fasa 180° akan berubah menjadi sinyal Positif sehingga D2 berubah menjadi kondisi Forward Bias yang melewatkan sisi sinyal Positif tersebut.

B. Penyearah Gelombang Penuh 4 Dioda (Bridge Rectifier)

Penyearah Gelombang Penuh dengan menggunakan 4 Dioda adalah jenis Rectifier yang paling sering digunakan dalam rangkaian Power Supply karena memberikan kinerja yang lebih baik dari jenis Penyearah lainnya. Penyearah Gelombang Penuh 4 Dioda ini juga sering disebut dengan Bridge Rectifier atau Penyearah Jembatan.



Berdasarkan gambar diatas, jika Transformer mengeluarkan output sisi sinyal Positif (+) maka Output maka D1 dan D2 akan berada dalam kondisi Forward Bias sehingga melewatkan sinyal Positif tersebut sedangakan D3 dan D4 akan menghambat sinyal sisi Negatifnya. Kemudian pada saat Output Transformer berubah menjadi sisi sinyal Negatif (-) maka D3 dan D4 akan berada dalam kondisi Forward Bias sehingga melewatkan sinyal sisi Positif (+) tersebut sedangkan D1 dan D2 akan menghambat sinyal Negatifnya.

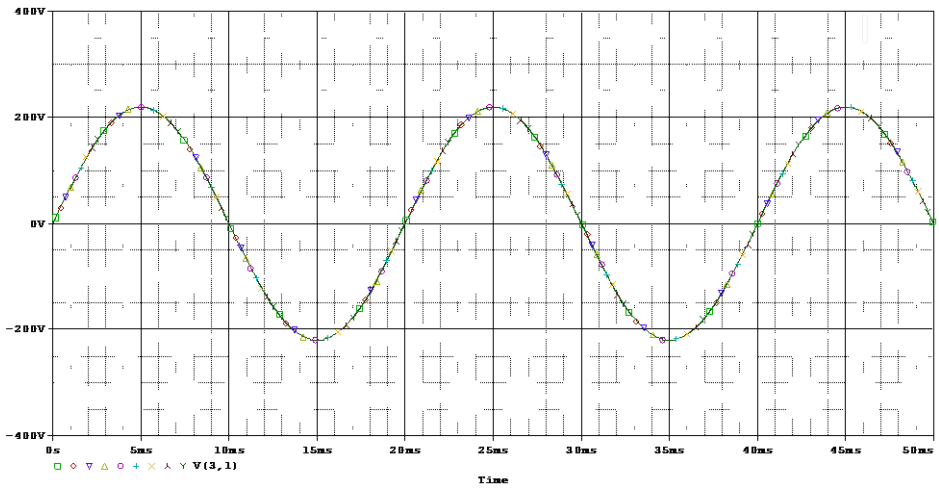
Program Spice Penyearah Berbasis SCR:

```
Rangkaian Penyearah SCR
.PARAM Ampl = 220V
.PARAM Freq = 50Hz
.PARAM DelayAngle1= 70
.PARAM PulseWidth= 500us
VS 3 1 SIN (0 {Ampl} {Freq})
Vc 3 2 DC 0
```

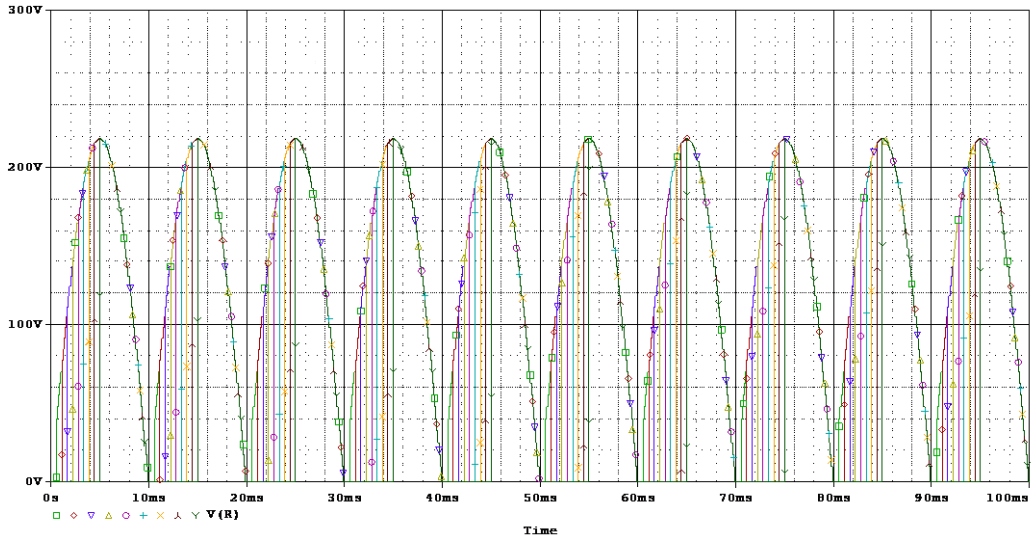
```
Vg1 5 0 PULSE (0 15 {{DelayAngle1}/{360*{Freq}}} 1ns 1ns
{PulseWidth} {1/{Freq}})
Vg2 6 0 PULSE (0 15 {{DelayAngle1}/{360*{Freq}}+0.01} 1ns 1ns
{PulseWidth} {1/{Freq}})
Vg3 7 4 PULSE (0 15 {{DelayAngle1}/{360*{Freq}}} 1ns 1ns
{PulseWidth} {1/{Freq}})
Vg4 8 4 PULSE (0 15 {{DelayAngle1}/{360*{Freq}}+0.01} 1ns 1ns
{PulseWidth} {1/{Freq}})
R 0 4 1k
.INC SCRmodel.cir
XT1 2 5 0 SCRMOD
XT2 1 6 0 SCRMOD
XT3 4 7 2 SCRMOD
XT4 4 8 1 SCRMOD
.STEP PARAM DelayAngle1 10 90 10
.TRAN 1us 100ms 0 1us
.PROBE V(3,1) V(R) I(R) V(Vg1) V(Vg2) V(Vg3) V(Vg4)
.END
```

Hasil Simulasi Penyearah Berbasis SCR (Waveform)

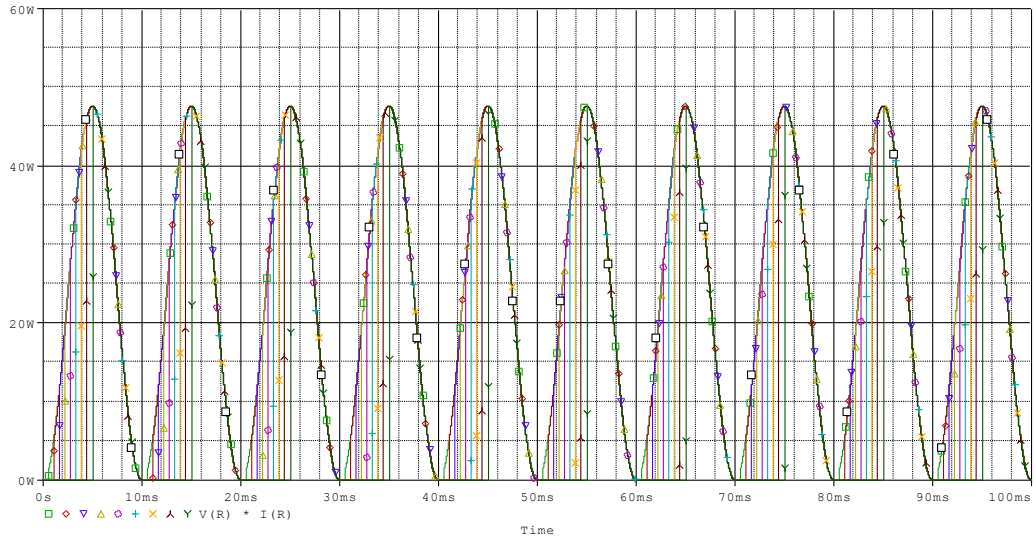
Vs



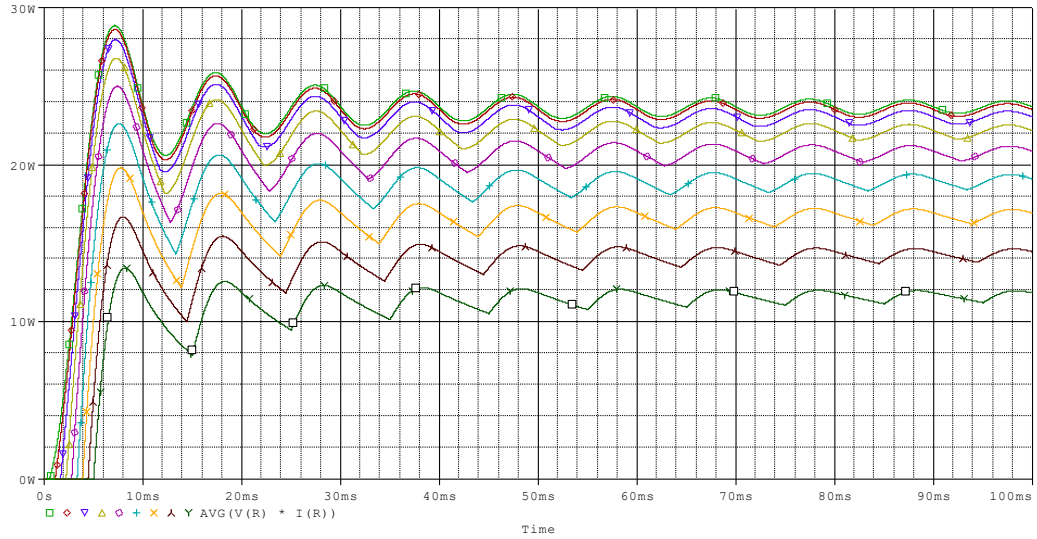
VR


300V
200V
100V
0V
0s
10ms
20ms
30ms
40ms
50ms
60ms
70ms
80ms
90ms
100ms
V(R)
Time

Power


60W
40W
20W
0W
0s
10ms
20ms
30ms
40ms
50ms
60ms
70ms
80ms
90ms
100ms
V(R) * I(R)
Time

AVGPower



Sudut penyalaan	Daya luaran rata-rata
10^{o}	2
20^{o}	5
30^{o}	15
40	30
50	35
60	44
70	45
80	46
90	47

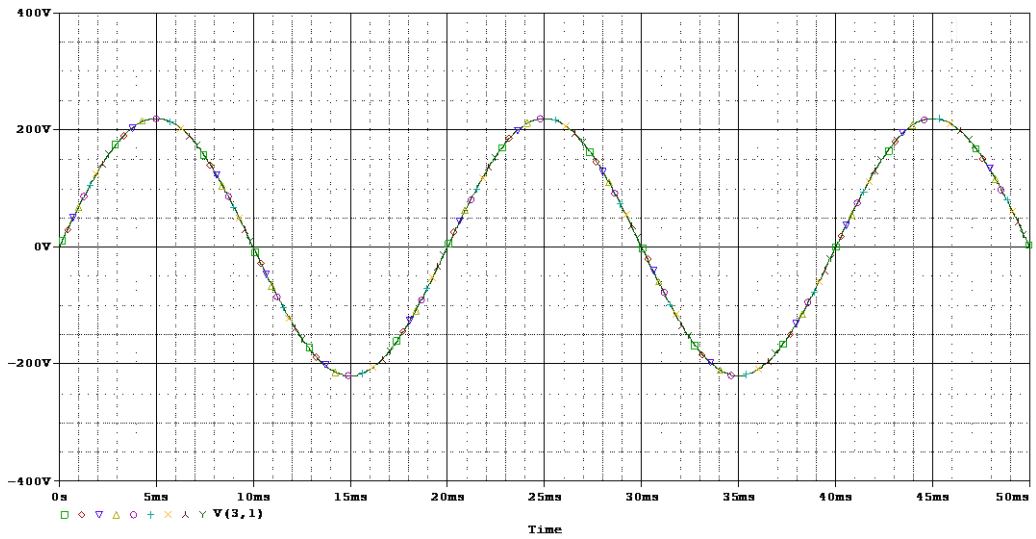
Program Spice Penyearah Berbasis SCR-Dioda:

```
Rangkaian Penyearah SCR-Diode
.PARAM Ampl = 220V
.PARAM Freq = 50Hz
.PARAM DelayAngle1= 10
.PARAM PulseWidth= 1000us
VS 3 1 SIN (0 {Ampl} {Freq})
Vc 3 2 DC 0
Vg1 5 0 PULSE (0 170 {{DelayAngle1}/{360*{Freq}}} 1ns 1ns
{PulseWidth} {1/{Freq}})
```

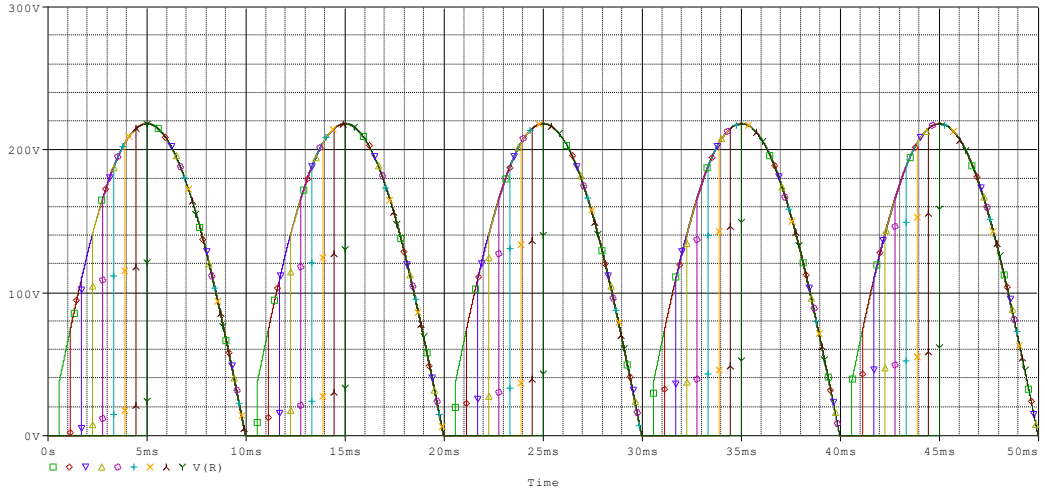
```
Vg2 6 0 PULSE (0 170 {{DelayAngle1}/{360*{Freq}}+0.01} 1ns 1ns
{PulseWidth} {1/{Freq}})
R 0 4 1k
.INC SCRmodel.cir
.MODEL DMOD D(IS=2.2E-15 BV=1200V CJO=1PF TT=0)
XT1 2 5 0 SCRMOD
XT2 1 6 0 SCRMOD
D3 4 2 DMOD
D4 4 1 DMOD
.STEP PARAM DelayAngle1 10 90 10
.TRAN 0.5us 50MS 0 0.5us
.PROBE V(3,1) I(Vc) I(R) V(R)
.END
```

Hasil Simulasi Penyearah Berbasis SCR-Dioda (Waveform)

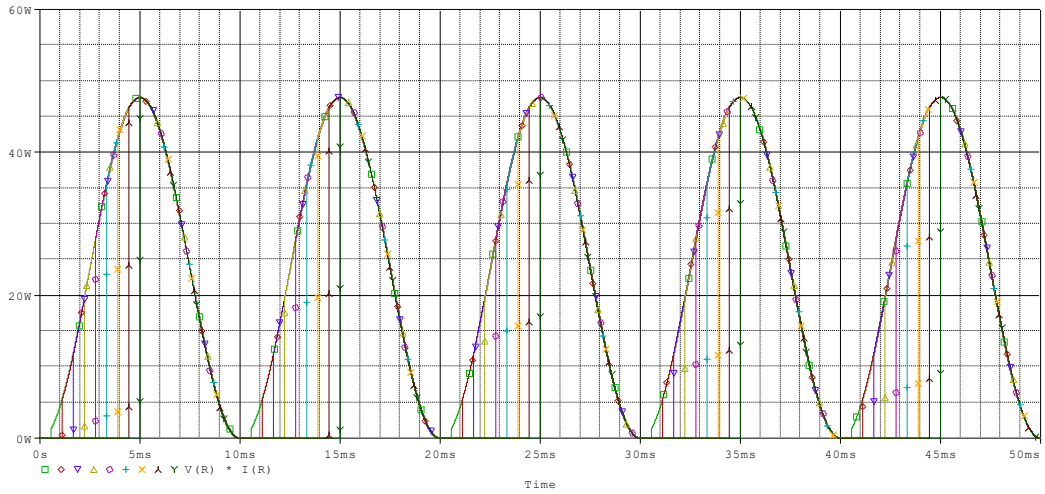
Vs



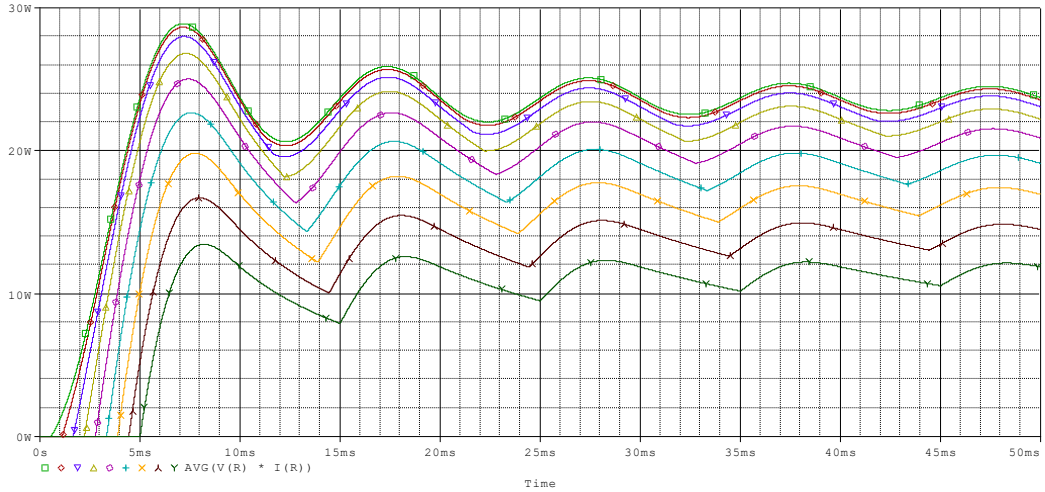
VR



Power



Power Average



Sudut penyalaan	Daya luaran rata-rata
10^{o}	2
20^{o}	5
30^{o}	15
40	30
50	35
60	44
70	45
80	46
90	47

SIMPULAN

1. Perbedaan bentuk gelombang antar SCR dan diode tidak terlalu jauh hanya di bedakan dengan besarnya arus pada gate dari SCR
2. Perbedaan antara penyearah SCR dan diode terletak pada penggunaan pulse yang digunakan, pada SCR pulse digunakan secara parallel oleh 2 SCR sehingga membtuhkan arus yang lebih besar pada gatenya sedangkan pada SCR-Diode tidak terlalu membutuhkan arus yang besar. Sedangkan persamaanya bentuk gelombang yang dihasilkan sangatlha mirip.
3. Prinsip kerja dari sudut penyalaan ada kapan waktu gate dari SCR diberi detak sehingga berfungsi sebagai penyearah. Perbedaan watu itulah yang menjadika keluaran dari penyearah akan sangat berpengaruh.
4. Manfaat Dari SCR adalah :

- Mudahnya mengatur besar tegangan luaran yang dihasilkan oleh penyearah
- Memberikan control untuk mengatur sebuah inputan dapat digunakan
- Memiliki lebih banyak pilihan dalam mengatur penyearah

MODUL 3 Penyearah Berbasis SCR

Tujuan praktikum:

(1) Praktikan/mahasiswa mampu mengenal dan memahami fungsi dari piranti Thyristor SCR (*Silicon Controlled Rectifier*) dalam rangkaian elektronika daya

(2) Praktikan/mahasiswa mampu menjelaskan prinsip kerja rangkaian penyearah berbasis Thyristor SCR.

NAMA MHS :	M. A. Askar Annadwi	**KRITERIA PENILAIAN:**	**NILAI:**
		Kedisiplinan dan Kejujuran :	.....
NIM :	D041181027	Kreativitas dan Ketelitian :	.....
		Penguasaan Materi :	.....
		Kemampuan Menjawab Soal :	.....
		TOTAL NILAI:	.....

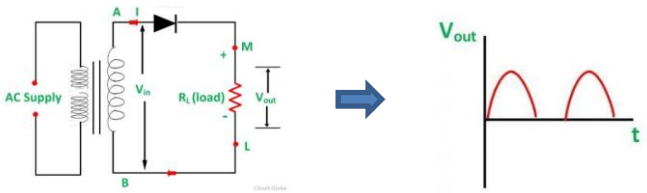
INSTRUKSI: Ikutilah Langkah-langkah yang ditunjukkan pada Modul 3 Buku Penuntun Praktikum Elektronika Daya, lalu sisipkanlah hasil-hasil simulasi ke dalam Lembar Kerja Praktikum (LKM) ini.

Jawaban Soal-soal Teori Dasar:

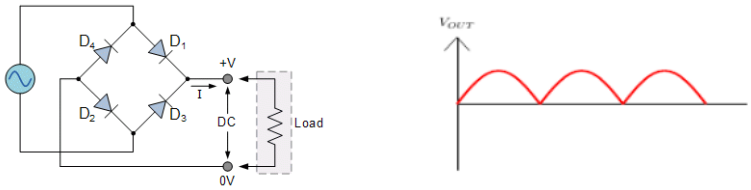
(1) Rangkaian penyearah (*rectifier circuit*) adalah rangkaian yang mengkonversi AC ke DC. Penyearah dapat di klasifikasi menjadi dua yaitu, penyearah satu fasa dan tiga fasa, selanjutnya dibagi lagi menjadi penyearah gelombang setengah (*half wave*), penyearah gelombang penuh (*full wave*) – menggunakan trafo CT, dan penyearah bridge.

(2) Rangkaian penyearah digunakan pada *charger* laptop, smart dan hp. Rangkaian penyearah juga digunakan pada *power supply*, selain itu juga digunkan pada banyak peralatan di rumah, sepeti televisi, radio, dan banyak lainnya. Semua alat tersebut menggunakan masukan AC 220V, tapi didalam rangkaiannya semua memiliki rangkaian penyearah.

(3) Dalam Penyearah Gelombang Setengah, ketika suplai AC diterapkan pada input, setengah siklus positif muncul di seluruh beban, sedangkan setengah siklus negatif ditekan. Penyearah gelombang setengah hanya menggunakan satu dioda



Pada penyearah Gelombang Penuh, ketika suplai AC diterapkan pada input, selama kedua setengah siklus (yaitu, positif maupun negatif) arus mengalir melalui beban ke arah yang sama



.

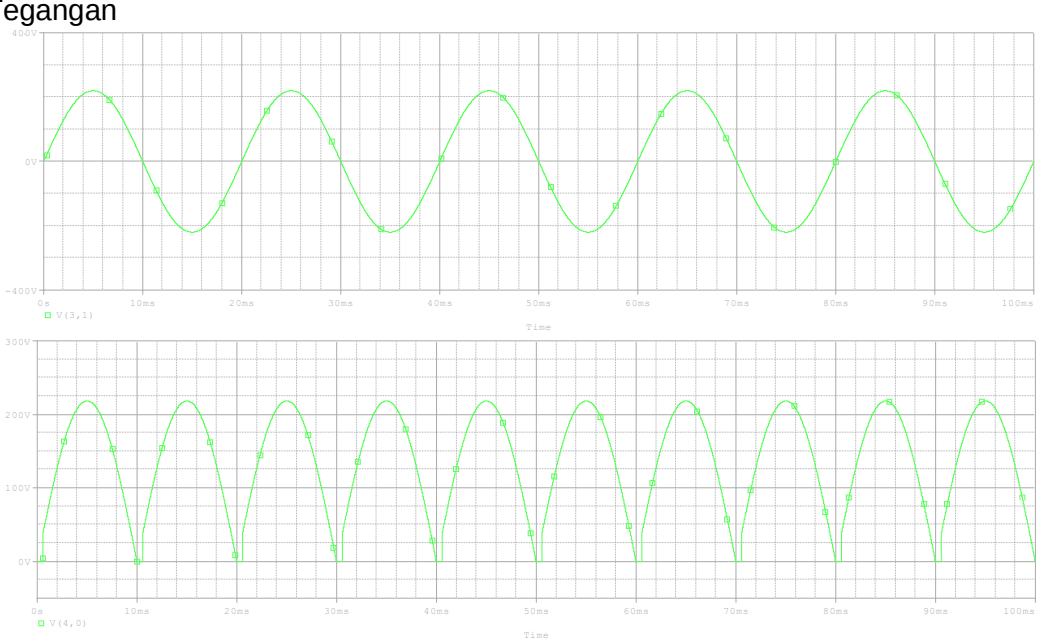
Program Spice Penyearah Berbasis SCR:

```
Rangkaian Penyearah berbasis SCR
.PARAM Ampl = 220V
.PARAM Freq = 50Hz
.PARAM DelayAngle = 10
.PARAM PulseWidth = 500us
VS 3 1 SIN (0 {Ampl} {Freq})
* siklus I Vs - T1 - RL - T4*
Vgt1 5 4 PULSE (0 15 {{DelayAngle}/{360*{Freq}}} 1ns 1ns
+ {PulseWidth} {1/{Freq}})
Vgt4 8 1 PULSE (0 15 {{DelayAngle}/{360*{Freq}}} 1ns 1ns
+ {PulseWidth} {1/{Freq}})
* siklus II Vs - T2 - RL - T3*
Vgt2 6 4 PULSE (0 15 {{{DelayAngle}+180}/{360*{Freq}}} 1ns 1ns
+ {PulseWidth} {1/{Freq}})
Vgt3 7 2 PULSE (0 15 {{{DelayAngle}+180}/{360*{Freq}}} 1ns 1ns
+ {PulseWidth} {1/{Freq}})
R 4 0 500
Vsens 3 2 DC 0V ; Sumber tegangan 0 sebagai sensor arus
.INC lkm_3_scr_model.cir ; menyertakan model thyrsitor SCR
XT1 2 5 4 SCRMOD ; Thyristor T1
XT4 0 8 1 SCRMOD ; Thyristor T4
XT2 1 6 4 SCRMOD ; Thyristor T2
XT3 0 7 2 SCRMOD ; Thyristor T3
*.STEP PARAM DelayAngle List 10 20 30 40 50 60
.TRAN 0.5US 100MS 0 0.5uS
.PROBE V(3,1) V(4,0) I(Vsens) I(R)
.END
```

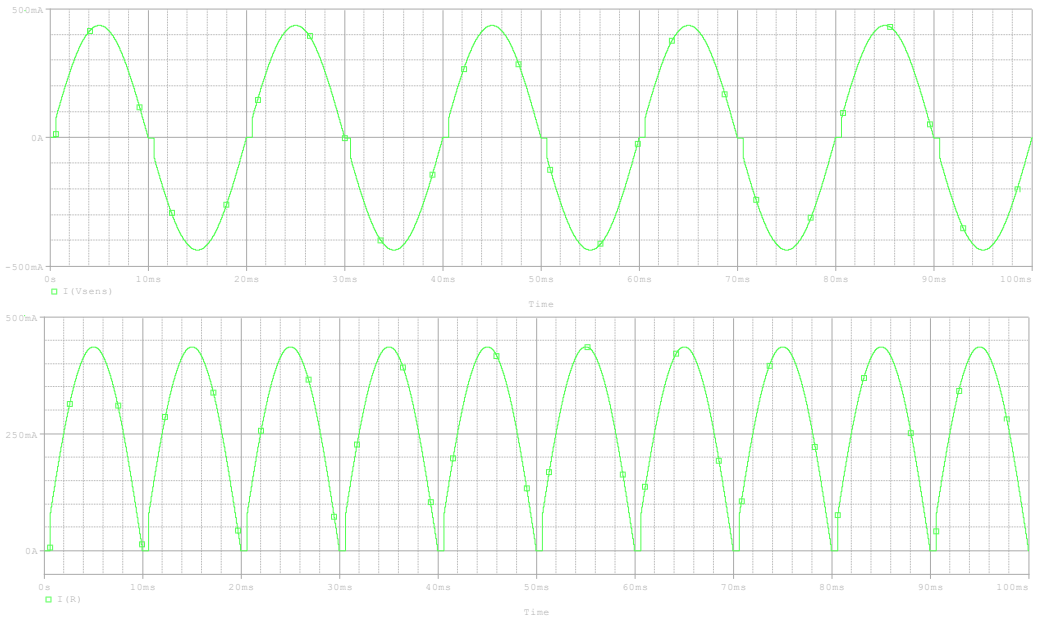
Hasil Simulasi Penyearah Berbasis SCR (Waveform)

Pada sudut penyalaan 10°

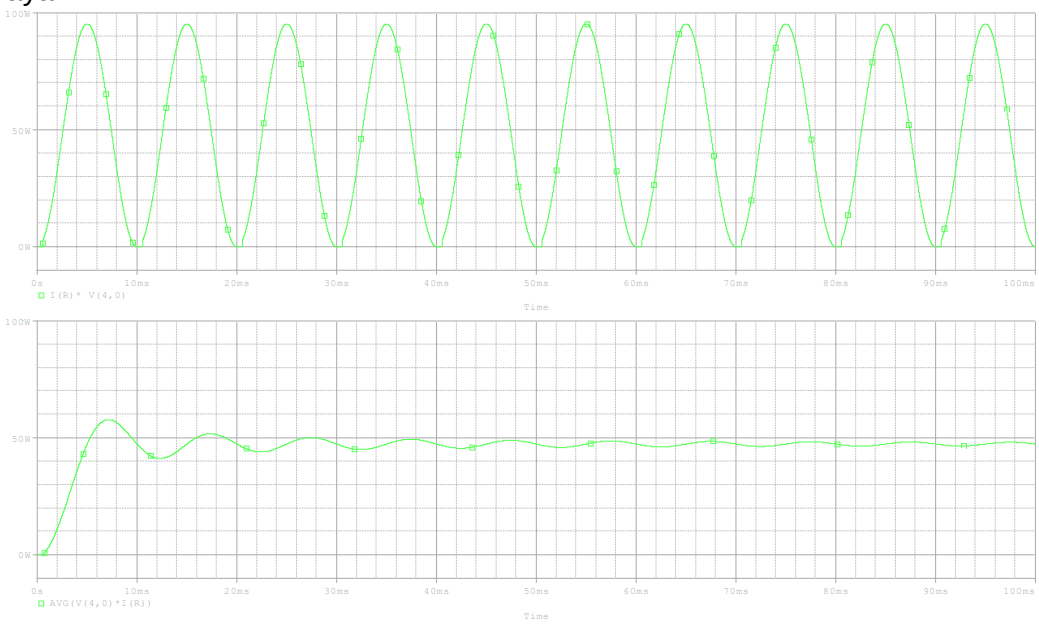
Tegangan



Arus



Daya



Sudut penyalaan	Daya luaran rata-rata
10°	47.5 W
20°	47 W
30°	46 W
40°	44 W
50°	41.5 W
60°	38 W

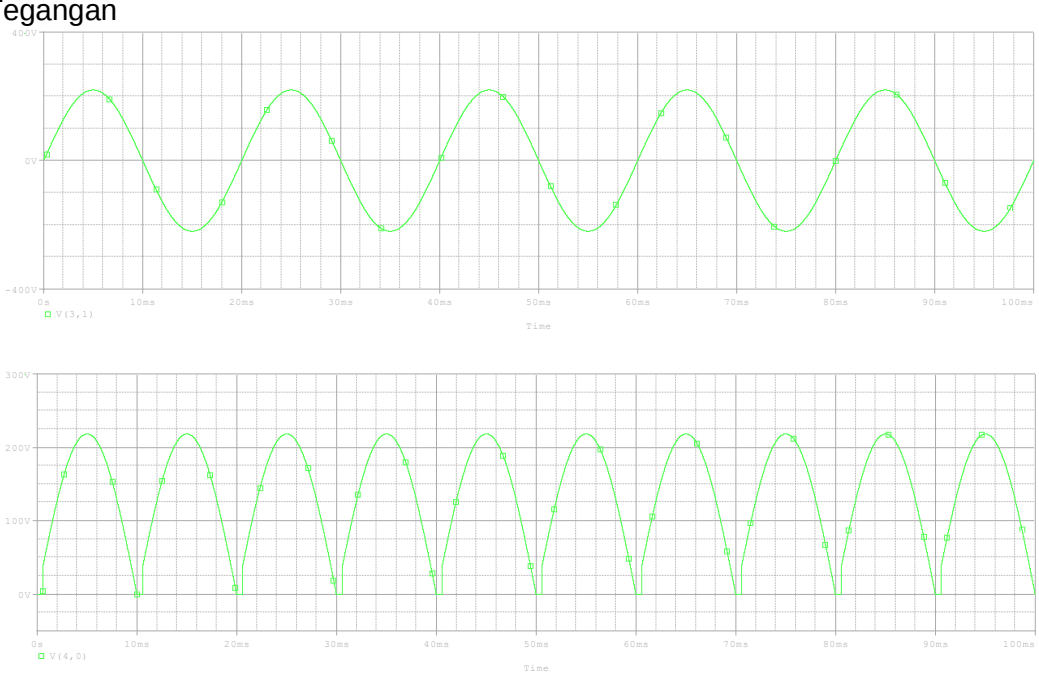
Program Spice Penyearah Berbasis SCR-Dioda:

```
Rangkaian Penyearah berbasis SCR-Dioda
.PARAM Ampl = 220V
.PARAM Freq = 50Hz
.PARAM DelayAngle = 10
.PARAM PulseWidth = 500us
VS 3 1 SIN (0 {Ampl} {Freq})
* siklus I Vs - T1 - RL - D2*
Vgt1 5 4 PULSE (0 15 {{DelayAngle}/{360*{Freq}}} 1ns 1ns
+ {PulseWidth} {1/{Freq}})
* siklus II Vs - T2 - RL - D1*
Vgt2 6 4 PULSE (0 15 {{{DelayAngle}+180}/{360*{Freq}}} 1ns 1ns
+ {PulseWidth} {1/{Freq}})
R 4 0 500
Vsens 3 2 DC 0V ; Sumber tegangan 0 sebagai sensor arus
DX1 0 2 DMOD ; Dioda D1
DX2 0 1 DMOD ; Dioda D2
.MODEL DMOD D(IS=2.2E-15 BV=1200V CJO=1PF TT=0)
.INC lkm_3_scr_model.cir ; menyertakan model thyrsitor SCR
XT1 2 5 4 SCRMOD ; Thyristor T1
XT2 1 6 4 SCRMOD ; Thyristor T2
*.STEP PARAM DelayAngle List 10 20 30 45 60 90
.TRAN 0.5US 100MS 0 0.5uS
.PROBE V(3,1) I(Vsens) V(4,0) I(R)
.END
```

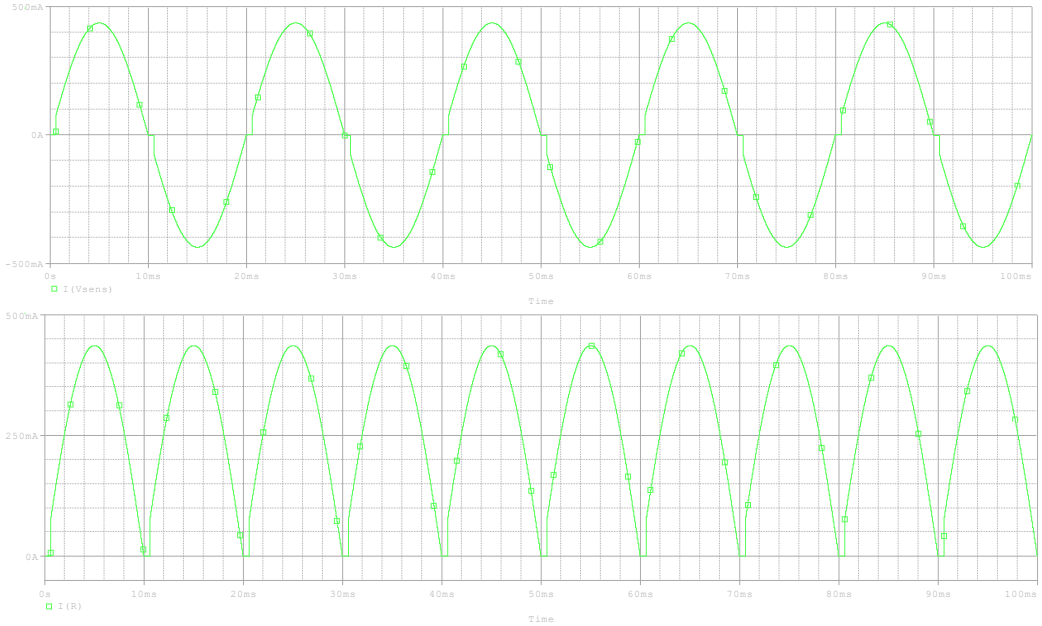
Hasil Simulasi Penyearah Berbasis SCR-Dioda (Waveform)

Pada sudut penyalaan 10°

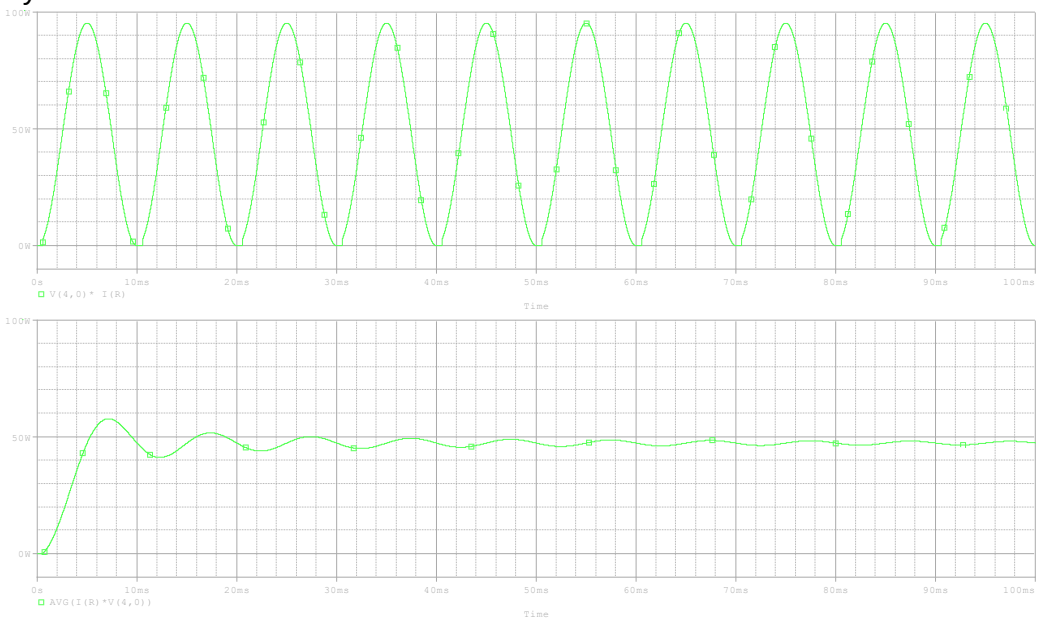
Tegangan



Arus



Daya



Sudut penyalaan	Daya luaran rata-rata
10°	47.5 W
20°	47 W
30°	46 W
40°	44 W
50°	41.5 W
60°	38 W

SIMPULAN

Dapat dilihat pada gambar diatas bahwa bentuk gelombang penyearah berbasis scr dan penyearah berbasis scr-dioda adalah sama pada parameter variabel yang sama pula. Perbedannya tentu adalah dari banyak scr yang dikontrol dalam rangkaian tersebut, untuk berbasis scr ada 4 scr yang harus di kontrol, sedangkan berbasis scr-dioda hanya dua, jadi tentu menurut saya yang lebih efektif dalam penggunaannya adalah penyerah berbasis scr-dioda.

Pada rangkaian penyearah berbasis SCR maupun SCR-dioda, semakin besar sudut penyalaan SCR maka semakin kecil daya yang berlaku pada beban, karena daya hanya akan disalurkan ketika SCR aktif.

Khusus pada penyearah berbasis SCR, trigger dari sumber pulse harus sinkron, antara SCR pada siklus 1 (sebut siklus positif), maksudnya antara T1 dan T4. Begitupun pada siklus 2 (sebut siklus negatif) yaitu antara T2 dan T3. Toleransi sudut penyalaan pada sebuah siklus adalah sebesar pulsewidth yang diterapkan, pada program diatas yaitu 0.5ms. karena setiap satu derajat sudut penyalaan pada 50Hz sebesar ±0.05ms, maka perbedaan sudut penyalaan pada sebuah siklus yaitu +10°.

Manfaat utama dari penyearah SCR adalah kita bisa mengontrol sudut penyalaan untuk menyalurkan daya pada beban. Dengan kata lain, kita bisa menentukan seberapa besar daya yang berlaku pada beban.