|  |  |  |
| --- | --- | --- |
|  | **UNIVERSITAS SUMATERA UTARA (USU)****FAKULTAS TEKNIK****DEPARTEMEN TEKNIK ELEKTRO** | **Kode Dokumen** |
| **RENCANA PEMBELAJARAN SEMESTER** |
| **MATA KULIAH (MK)** | **KODE** | **Rumpun MK** | **BOBOT (sks)** | **SEMESTER** | **Tgl Penyusunan** |
| Rangkaian Listrik 2 | TEE1205 |  | **Teori****2** | **Praktikum** **1** |  | 7 AGUSTUS 2022 |
| **OTORISASI / PENGESAHAN** | **Dosen Pengembang RPS** | **Koordinator RMK** | **Ka Prodi** |
| Ir. Raja Harahap, MT |  | Suherman, ST., M.Comp., Ph.D |
| **Capaian Pembelajaran** | **CPL-PRODI yang dibebankan pada MK**  |  |
| CPL-1 | Mampu menerapkan pengetahuan matematika, ilmu pengetahuan alam/atau material, teknologi informasi dan kerekayasaan untuk mendapatkan pemahaman menyeluruh tentang prinsip-prinsip Teknik Elektro. |
| CPL-2 | Mampu mendesain komponen, sistem dan/atau proses untuk memenuhi kebutuhan yang diharapkan oleh masyarakat dengan dihadapkan pada batasan realistik yang meliputi aspek hukum, ekonomi, lingkungan, sosial, politik, kesehatan dan keselamatan, keberlanjutan. |
| CPL-3 | Mampu mendesain eksperimen laboratorium dan/atau lapangan serta menganalisis dan mengartikan data untuk memperkuat penilaian teknik khususnya dalam bidang Teknik Elektro. |
| CPL-4 | Mampu menyelesaikan permasalahan teknik khususnya dalam bidang Teknik Elektro secara bertanggungjawab dan memenuhi etika profesi. |
| CPL-5 | Mampu menerapkan metode, keterampilan dan perangkat teknik modern yang diperlukan untuk praktek profesi Teknik Elektro. |
| CPL-6 | Mampu berkomunikasi secara efektif, baik lisan maupun tulisan. |
| CPL-7 | Mampu mengevaluasi tugas-tugas dalam batasan yang ada secara disiplin dan menyeluruh. |
| CPL-8 | Mampu untuk bekerja dalam tim lintas disiplin dan multikultural serta global internasional. |
| CPL-9 | Mampu untuk bertanggung jawab kepada masyarakat dan mematuhi etika profesi dalam menyelesaikan permasalahan Teknik Elektro. |
| CPL-10 | Memiliki kapasitas pembelajaran sepanjang hayat termasuk akses pengetahuan yang relevan tentang isu-isu terkini. |
| CPL-11 | Mampu mengidentifikasi potensi daerah di Sumatera Utara dan menerapkan inovasi, metode, keterampilan, dan perangkat teknik elektro yang relevan untuk mengembangkan potensi daerah tersebut. |
| CPL-12 | Mampu mendesain sistem dan/atau proses untuk memanfaatkan energi baru dan terbarukan sebagai sumber energi listrik alternatif dari potensi sumber daya lokal dan nasional dengan wawasan global. |
| **Capaian Pembelajaran Mata Kuliah (CPMK)**  |  |
| CPMK 1 | Mengenal kondisi steady state dan transient |
| CPMK 2 | Memahami prinsip kerja transeint pada rangkaian RLC |
| CPMK 3 | Memahami secara logis parameter-parameter dan konversi dan interkoneksinya |
| CPMK 4 | Mengenal konsep dasar dengan melakukan praktikum |
| **Peta CPL – CPMK** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **CPL 01** | **CPL 02** | **CPL 03** | **CPL 04** | **CPL 05** | **CPL 06** | **CPL 07** | **CPL 08** | **CPL 09** | **CPL 10** | **CPL 11** | **CPL 12** |
| CPMK 1  | V | V | V | V | V | V |  |  |  |  |  |  |
| CPMK 2  | V | V | V | V | V | V | V | V | V | V |  |  |
| CPMK 3 |  |  |  | V | V | V | V | V | V | V | V | V |
| CPMK 4 |  |  |  |  |  |  |  |  |  | V | V | V |

 |
| **Diskripsi Singkat MK** | Mata kuliah Rangkaian Listrik II membahas masalah transient pada rangkaian, rangkaian kutub empat, praktikum rangkaian dengan menggunakan Hukum Ohm; Hukum Kirchoff dan Teorema Superposisi; Transformasi Delta – Wye dan Wye – Delta; Metode Thevenin dan Norton; Reaktansi Kapasitif dan Rangkaian RC Seri; Resonansi Seri dan Paralle |
| **Bahan Kajian:** Materi pembelajaran | Kontrak Perkuliahan (Peraturan, Tugas,Buku,Sistem Penilaian) dan Konsep Perancangan; Kondisi Steady State dan Transient (Kondisi Awal dan Sifat Elemen Rangkaian Saat Ditransient); Kondisi Awal Suatu Turunan; Transient Pada Rangkaian Dengan Sumber Unit Step; Transient Pada Rangkaian Rlc Paralel Dengan Sumber Unit Step dan Rangkaian Transient Dengan Sumber Fungsi Eksponensial; Transient Pada Rangkaian Paralel Rls Dengan Input Fungsi Eksponensial dan Sumber Fungsi Sinusoidal; Transient Pada Rangkaian Rlc Paralel dan Seri Dengan Input Sinusoidal, Rangkaian Kutub Empat; Parameter "G" ; "Abcd" dan "Abcd"; Konversi dan Interkoneksi Antar Parameter-Parameter Kutub 4; Tugas Sebelum Praktikum; Praktikum Melihat Gelombang Listrik Dengan Osiloskop; Mahasiswa dapat mengerjakan latihan tentang praktikum percobaan hukum ohm, hukum kirchoff dan teorema superposisi dan transformasi wye-delta; Mahasiswa memahami perkembangan teori praktikum menggunakan metode thevenin, norton, dan reaktansi, kapasitansi dan rangkaian rc seri; Mahasiswa memahami praktikum resonansi |
| **Pustaka** | **Utama:** |  |
| 1. Josep A. Edminister MSE, Theory and Problem of Electric Circuits, Schaum’s Outline Series. Mc. Graw-Hill International Book Company.
 |
| **Pendukung:** |  |
| 1. WH. Hyat, JR., JE.Kemmerly, 1994, Rangkaian Listrik Jilid I, Penerbit Erlangga Jakarta.
2. Budiono Ismail, 1997, Rangkaian Listrik Jilid Pertama, Penerbit ITB Bandung.
3. Mohamad Ramdhani, 2008, Rangkaian Listrik, Penerbit Erlangga Jakarta.
4. Robert L. Boylestad, 2003, *Introductory Circuit Analysis*, Tenth edition, Prentice Hall Pearson Education International.
5. A. Bruce Carlson, 2000, CIRCUITS-Engineering Concepts and Analysis of Linier Electric Circuits, Brooks / Cole Thomson Learning.
6. DLL.
 |
| **Dosen Pengampu** | Ir. Raja Harahap, MT |
| **Matakuliah syarat** | Rangkaian Listrik 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Mg Ke-** | **Kemampuan akhir tiap tahapan belajar (Sub-CPMK)** | **Penilaian** | **Bantuk Pembelajaran;****Metode Pembelajaran;****Penugasan Mahasiswa;****[ Estimasi Waktu]** | **Materi Pembelajaran****[Pustaka]** | **Bobot Penilaian (%)** |
| **Indikator** | **Kriteria & Teknik** |
| **(1)** | **(2)** | **(3)** | **(4)** | **Tatap Muka(5)** | **Daring (6)** | **(7)** | **(8)** |
| 1 | Mahasiswa menguasai teori kontrak perkuliahan (peraturan, tugas,buku,sistem penilaian) dan konsep perancangan | 1. *The accuracy in providing the information required*
2. *The student’s fluency in reading the memo (spelling, intonation, and speed)*
3. *The correctness of the student’s answers*
 | **Kriteria:***Marking Scheme***Bentuk:***Worksheet* (Non-Tes)1. *Reading the memo provided.*
2. *Responding to the opening questions given.*
3. *Completing the table (problem-solution) according to the information in the memo.*
4. *Finding the word or phrase with similar meaning (synonym) according to the information in the memo.*

*Classifying the words or phrases with the correct headings.* | BM [(1x(2x60”)]**Kegiatan:**1. *Reviewing the previous lessons.*
2. *Reading the added learning materials.*
3. *Recording the presence.*
4. *Responding to opening questions in the ‘Discussion Forum’ section.*
5. *Submitting the assigned tasks.*

PT [(1x(2x60”)]**Task 3:***Restating the information obtained in the form of an a-150-words paragraph.* **Moda (*Learning Management System*):**elearning@usu.ac.id | TM [(1x(2x50”)]**Kegiatan:**1. *Making notes of the learning materials explained.*
2. *Responding to the questions or instructions given.*
3. *Completing all the provided exercises individually.*
4. *Discussing the exercises completed.*

**Media:***Power Point Presentation (PPT)**Zoom Meeting* *Audio Recording**English Handout***Metode Pembelajaran:**1. *Online Lecture*
2. *Discussion*
3. *Self-Paced*

*Learning* | **Pokok Bahasan:**Kontrak Perkuliahan (Peraturan, Tugas,Buku,Sistem Penilaian) dan Konsep Perancangan**Referensi:*** Budiono Ismail, 1997, Rangkaian Listrik Jilid Pertama, Penerbit ITB Bandung.
 | 5% |
| 2 | Mahasiswa memahami kondisi steady state dan transient (kondisi awal dan sifat elemen rangkaian saat ditransient) | 1. *The accuracy in providing the information required*
2. *The student’s fluency in reading the memo (spelling, intonation, and speed)*
3. *The correctness of the student’s answers*
 | **Kriteria:***Marking Scheme***Bentuk:***Worksheet* (Non-Tes)1. *Reading the memo provided.*
2. *Responding to the opening questions given.*
3. *Completing the table (problem-solution) according to the information in the memo.*
4. *Finding the word or phrase with similar meaning (synonym) according to the information in the memo.*

*Classifying the words or phrases with the correct headings.* | BM [(1x(2x60”)]**Kegiatan:**1. *Reviewing the previous lessons.*
2. *Reading the added learning materials.*
3. *Recording the presence.*
4. *Responding to opening questions in the ‘Discussion Forum’ section.*
5. *Submitting the assigned tasks.*

PT [(1x(2x60”)]**Task 3:***Restating the information obtained in the form of an a-150-words paragraph.* **Moda (*Learning Management System*):**elearning@usu.ac.id | TM [(1x(2x50”)]**Kegiatan:**1. *Making notes of the learning materials explained.*
2. *Responding to the questions or instructions given.*
3. *Completing all the provided exercises individually.*
4. *Discussing the exercises completed.*

**Media:***Power Point Presentation (PPT)**Zoom Meeting* *Audio Recording**English Handout***Metode Pembelajaran:**1. *Online Lecture*
2. *Discussion*
3. *Self-Paced*

*Learning* | **Pokok Bahasan:**Kondisi Steady State dan Transient (Kondisi Awal dan Sifat Elemen Rangkaian Saat Ditransient)**Referensi:*** WH. Hyat, JR., JE.Kemmerly, 1994, Rangkaian Listrik Jilid I, Penerbit Erlangga Jakarta.
* Budiono Ismail, 1997, Rangkaian Listrik Jilid Pertama, Penerbit ITB Bandung.
* Mohamad Ramdhani, 2008, Rangkaian Listrik, Penerbit Erlangga Jakarta.
* Josep A. Edminister MSE, Theory and Problem of Electric Circuits, Schaum’s Outline Series. Mc. Graw-Hill International Book Company.
* A. Bruce Carlson, 2000, CIRCUITS-Engineering Concepts and Analysis of Linier Electric Circuits, Brooks / Cole Thomson Learning.

 DLL | 5% |
| 3 | Mahasiswa menguasai kondisi awal suatu turunan | 1. *The accuracy in providing the information required*
2. *The student’s fluency in reading the memo (spelling, intonation, and speed)*
3. *The correctness of the student’s answers*
 | **Kriteria:***Marking Scheme***Bentuk:***Worksheet* (Non-Tes)1. *Reading the memo provided.*
2. *Responding to the opening questions given.*
3. *Completing the table (problem-solution) according to the information in the memo.*
4. *Finding the word or phrase with similar meaning (synonym) according to the information in the memo.*

*Classifying the words or phrases with the correct headings.* | BM [(1x(2x60”)]**Kegiatan:**1. *Reviewing the previous lessons.*
2. *Reading the added learning materials.*
3. *Recording the presence.*
4. *Responding to opening questions in the ‘Discussion Forum’ section.*
5. *Submitting the assigned tasks.*

PT [(1x(2x60”)]**Task 3:***Restating the information obtained in the form of an a-150-words paragraph.* **Moda (*Learning Management System*):**elearning@usu.ac.id | TM [(1x(2x50”)]**Kegiatan:**1. *Making notes of the learning materials explained.*
2. *Responding to the questions or instructions given.*
3. *Completing all the provided exercises individually.*
4. *Discussing the exercises completed.*

**Media:***Power Point Presentation (PPT)**Zoom Meeting* *Audio Recording**English Handout***Metode Pembelajaran:**1. *Online Lecture*
2. *Discussion*
3. *Self-Paced*

*Learning* | **Pokok Bahasan:**Kondisi Awal Suatu Turunan**Referensi:*** WH. Hyat, JR., JE.Kemmerly, 1994, Rangkaian Listrik Jilid I, Penerbit Erlangga Jakarta.
* Budiono Ismail, 1997, Rangkaian Listrik Jilid Pertama, Penerbit ITB Bandung.
* Mohamad Ramdhani, 2008, Rangkaian Listrik, Penerbit Erlangga Jakarta.
* Josep A. Edminister MSE, Theory and Problem of Electric Circuits, Schaum’s Outline Series. Mc. Graw-Hill International Book Company.
* A. Bruce Carlson, 2000, CIRCUITS-Engineering Concepts and Analysis of Linier Electric Circuits, Brooks / Cole Thomson Learning.

 DLL | 5% |
| 4 | Mahasiswa mampu menerapkan teori transient pada rangkaian dengan sumber unit step | 1. *The accuracy in providing the information required*
2. *The student’s fluency in reading the memo (spelling, intonation, and speed)*
3. *The correctness of the student’s answers*
 | **Kriteria:***Marking Scheme***Bentuk:***Worksheet* (Non-Tes)1. *Reading the memo provided.*
2. *Responding to the opening questions given.*
3. *Completing the table (problem-solution) according to the information in the memo.*
4. *Finding the word or phrase with similar meaning (synonym) according to the information in the memo.*

*Classifying the words or phrases with the correct headings.* | BM [(1x(2x60”)]**Kegiatan:**1. *Reviewing the previous lessons.*
2. *Reading the added learning materials.*
3. *Recording the presence.*
4. *Responding to opening questions in the ‘Discussion Forum’ section.*
5. *Submitting the assigned tasks.*

PT [(1x(2x60”)]**Task 3:***Restating the information obtained in the form of an a-150-words paragraph.* **Moda (*Learning Management System*):**elearning@usu.ac.id | TM [(1x(2x50”)]**Kegiatan:**1. *Making notes of the learning materials explained.*
2. *Responding to the questions or instructions given.*
3. *Completing all the provided exercises individually.*
4. *Discussing the exercises completed.*

**Media:***Power Point Presentation (PPT)**Zoom Meeting* *Audio Recording**English Handout***Metode Pembelajaran:**1. *Online Lecture*
2. *Discussion*
3. *Self-Paced*

*Learning* | **Pokok Bahasan:**Transient Pada Rangkaian Dengan Sumber Unit Step**Referensi:*** WH. Hyat, JR., JE.Kemmerly, 1994, Rangkaian Listrik Jilid I, Penerbit Erlangga Jakarta.
* Budiono Ismail, 1997, Rangkaian Listrik Jilid Pertama, Penerbit ITB Bandung.
* Mohamad Ramdhani, 2008, Rangkaian Listrik, Penerbit Erlangga Jakarta.
* Josep A. Edminister MSE, Theory and Problem of Electric Circuits, Schaum’s Outline Series. Mc. Graw-Hill International Book Company.
* A. Bruce Carlson, 2000, CIRCUITS-Engineering Concepts and Analysis of Linier Electric Circuits, Brooks / Cole Thomson Learning.

 DLL | 5% |
| 5 | Mahasiswa dapat mengerjakan latihan tentang transient pada rangkaian rlc paralel dengan sumber unit step dan rangkaian transient dengan sumber fungsi eksponensial | 1. *The accuracy in providing the information required*
2. *The student’s fluency in reading the memo (spelling, intonation, and speed)*
3. *The correctness of the student’s answers*
 | **Kriteria:***Marking Scheme***Bentuk:***Worksheet* (Non-Tes)1. *Reading the memo provided.*
2. *Responding to the opening questions given.*
3. *Completing the table (problem-solution) according to the information in the memo.*
4. *Finding the word or phrase with similar meaning (synonym) according to the information in the memo.*

*Classifying the words or phrases with the correct headings.* | BM [(1x(2x60”)]**Kegiatan:**1. *Reviewing the previous lessons.*
2. *Reading the added learning materials.*
3. *Recording the presence.*
4. *Responding to opening questions in the ‘Discussion Forum’ section.*
5. *Submitting the assigned tasks.*

PT [(1x(2x60”)]**Task 3:***Restating the information obtained in the form of an a-150-words paragraph.* **Moda (*Learning Management System*):**elearning@usu.ac.id | TM [(1x(2x50”)]**Kegiatan:**1. *Making notes of the learning materials explained.*
2. *Responding to the questions or instructions given.*
3. *Completing all the provided exercises individually.*
4. *Discussing the exercises completed.*

**Media:***Power Point Presentation (PPT)**Zoom Meeting* *Audio Recording**English Handout***Metode Pembelajaran:**1. *Online Lecture*
2. *Discussion*
3. *Self-Paced*

*Learning* | **Pokok Bahasan:**Transient Pada Rangkaian Rlc Paralel Dengan Sumber Unit Step dan Rangkaian Transient Dengan Sumber Fungsi Eksponensial**Referensi:*** WH. Hyat, JR., JE.Kemmerly, 1994, Rangkaian Listrik Jilid I, Penerbit Erlangga Jakarta.
* Budiono Ismail, 1997, Rangkaian Listrik Jilid Pertama, Penerbit ITB Bandung.
* Mohamad Ramdhani, 2008, Rangkaian Listrik, Penerbit Erlangga Jakarta.
* Josep A. Edminister MSE, Theory and Problem of Electric Circuits, Schaum’s Outline Series. Mc. Graw-Hill International Book Company.
* A. Bruce Carlson, 2000, CIRCUITS-Engineering Concepts and Analysis of Linier Electric Circuits, Brooks / Cole Thomson Learning.

 DLL | 5% |
| 6 | Mahasiswa memahami perkembangan teori transient pada rangkaian paralel rls dengan input fungsi eksponensial dan sumber fungsi sinusoidal | 1. *The accuracy in providing the information required*
2. *The student’s fluency in reading the memo (spelling, intonation, and speed)*
3. *The correctness of the student’s answers*
 | **Kriteria:***Marking Scheme***Bentuk:***Worksheet* (Non-Tes)1. *Reading the memo provided.*
2. *Responding to the opening questions given.*
3. *Completing the table (problem-solution) according to the information in the memo.*
4. *Finding the word or phrase with similar meaning (synonym) according to the information in the memo.*

*Classifying the words or phrases with the correct headings.* | BM [(1x(2x60”)]**Kegiatan:**1. *Reviewing the previous lessons.*
2. *Reading the added learning materials.*
3. *Recording the presence.*
4. *Responding to opening questions in the ‘Discussion Forum’ section.*
5. *Submitting the assigned tasks.*

PT [(1x(2x60”)]**Task 3:***Restating the information obtained in the form of an a-150-words paragraph.* **Moda (*Learning Management System*):**elearning@usu.ac.id | TM [(1x(2x50”)]**Kegiatan:**1. *Making notes of the learning materials explained.*
2. *Responding to the questions or instructions given.*
3. *Completing all the provided exercises individually.*
4. *Discussing the exercises completed.*

**Media:***Power Point Presentation (PPT)**Zoom Meeting* *Audio Recording**English Handout***Metode Pembelajaran:**1. *Online Lecture*
2. *Discussion*
3. *Self-Paced*

*Learning* | **Pokok Bahasan:**Mahasiswa memahami perkembangan teori transient pada rangkaian paralel rls dengan input fungsi eksponensial dan sumber fungsi sinusoidal**Referensi:*** WH. Hyat, JR., JE.Kemmerly, 1994, Rangkaian Listrik Jilid I, Penerbit Erlangga Jakarta.
* Budiono Ismail, 1997, Rangkaian Listrik Jilid Pertama, Penerbit ITB Bandung.
* Mohamad Ramdhani, 2008, Rangkaian Listrik, Penerbit Erlangga Jakarta.
* Josep A. Edminister MSE, Theory and Problem of Electric Circuits, Schaum’s Outline Series. Mc. Graw-Hill International Book Company.
* A. Bruce Carlson, 2000, CIRCUITS-Engineering Concepts and Analysis of Linier Electric Circuits, Brooks / Cole Thomson Learning.

 DLL | 5% |
| 7 | Mahasiswa dapat mempresentasikan pengetahuan transient pada rangkaian rlc paralel dan seri dengan input sinusoidal, rangkaian kutub empat | 1. *The accuracy in providing the information required*
2. *The student’s fluency in reading the memo (spelling, intonation, and speed)*
3. *The correctness of the student’s answers*
 | **Kriteria:***Marking Scheme***Bentuk:***Worksheet* (Non-Tes)1. *Reading the memo provided.*
2. *Responding to the opening questions given.*
3. *Completing the table (problem-solution) according to the information in the memo.*
4. *Finding the word or phrase with similar meaning (synonym) according to the information in the memo.*

*Classifying the words or phrases with the correct headings.* | BM [(1x(2x60”)]**Kegiatan:**1. *Reviewing the previous lessons.*
2. *Reading the added learning materials.*
3. *Recording the presence.*
4. *Responding to opening questions in the ‘Discussion Forum’ section.*
5. *Submitting the assigned tasks.*

PT [(1x(2x60”)]**Task 3:***Restating the information obtained in the form of an a-150-words paragraph.* **Moda (*Learning Management System*):**elearning@usu.ac.id | TM [(1x(2x50”)]**Kegiatan:**1. *Making notes of the learning materials explained.*
2. *Responding to the questions or instructions given.*
3. *Completing all the provided exercises individually.*
4. *Discussing the exercises completed.*

**Media:***Power Point Presentation (PPT)**Zoom Meeting* *Audio Recording**English Handout***Metode Pembelajaran:**1. *Online Lecture*
2. *Discussion*
3. *Self-Paced*

*Learning* | **Pokok Bahasan:**Transient Pada Rangkaian Rlc Paralel dan Seri Dengan Input Sinusoidal, Rangkaian Kutub Empat**Referensi:*** WH. Hyat, JR., JE.Kemmerly, 1994, Rangkaian Listrik Jilid I, Penerbit Erlangga Jakarta.
* Budiono Ismail, 1997, Rangkaian Listrik Jilid Pertama, Penerbit ITB Bandung.
* Mohamad Ramdhani, 2008, Rangkaian Listrik, Penerbit Erlangga Jakarta.
* Josep A. Edminister MSE, Theory and Problem of Electric Circuits, Schaum’s Outline Series. Mc. Graw-Hill International Book Company.
* A. Bruce Carlson, 2000, CIRCUITS-Engineering Concepts and Analysis of Linier Electric Circuits, Brooks / Cole Thomson Learning.

 DLL | 5% |
| 8 | UJIAN TENGAH SEMESTER |  |  |  |  |  | *15%* |
| 9 | Mahasiswa menguasai teori parameter "g" ; "abcd" dan "abcd" | 1. *The accuracy in providing the information required*
2. *The student’s fluency in reading the memo (spelling, intonation, and speed)*
3. *The correctness of the student’s answers*
 | **Kriteria:***Marking Scheme***Bentuk:***Worksheet* (Non-Tes)1. *Reading the memo provided.*
2. *Responding to the opening questions given.*
3. *Completing the table (problem-solution) according to the information in the memo.*
4. *Finding the word or phrase with similar meaning (synonym) according to the information in the memo.*

*Classifying the words or phrases with the correct headings.* | BM [(1x(2x60”)]**Kegiatan:**1. *Reviewing the previous lessons.*
2. *Reading the added learning materials.*
3. *Recording the presence.*
4. *Responding to opening questions in the ‘Discussion Forum’ section.*
5. *Submitting the assigned tasks.*

PT [(1x(2x60”)]**Task 3:***Restating the information obtained in the form of an a-150-words paragraph.* **Moda (*Learning Management System*):**elearning@usu.ac.id | TM [(1x(2x50”)]**Kegiatan:**1. *Making notes of the learning materials explained.*
2. *Responding to the questions or instructions given.*
3. *Completing all the provided exercises individually.*
4. *Discussing the exercises completed.*

**Media:***Power Point Presentation (PPT)**Zoom Meeting* *Audio Recording**English Handout***Metode Pembelajaran:**1. *Online Lecture*
2. *Discussion*
3. *Self-Paced*

*Learning* | **Pokok Bahasan:**Parameter "G" ; "Abcd" dan "Abcd"**Referensi:*** WH. Hyat, JR., JE.Kemmerly, 1994, Rangkaian Listrik Jilid I, Penerbit Erlangga Jakarta.
* Budiono Ismail, 1997, Rangkaian Listrik Jilid Pertama, Penerbit ITB Bandung.
* Mohamad Ramdhani, 2008, Rangkaian Listrik, Penerbit Erlangga Jakarta.
* Josep A. Edminister MSE, Theory and Problem of Electric Circuits, Schaum’s Outline Series. Mc. Graw-Hill International Book Company.
* A. Bruce Carlson, 2000, CIRCUITS-Engineering Concepts and Analysis of Linier Electric Circuits, Brooks / Cole Thomson Learning.

 DLL | 5% |
| 10 | Mahasiswa memahami konversi dan interkoneksi antar parameter-parameter kutub 4 | 1. *The accuracy in providing the information required*
2. *The student’s fluency in reading the memo (spelling, intonation, and speed)*
3. *The correctness of the student’s answers*
 | **Kriteria:***Marking Scheme***Bentuk:***Worksheet* (Non-Tes)1. *Reading the memo provided.*
2. *Responding to the opening questions given.*
3. *Completing the table (problem-solution) according to the information in the memo.*
4. *Finding the word or phrase with similar meaning (synonym) according to the information in the memo.*

*Classifying the words or phrases with the correct headings.* | BM [(1x(2x60”)]**Kegiatan:**1. *Reviewing the previous lessons.*
2. *Reading the added learning materials.*
3. *Recording the presence.*
4. *Responding to opening questions in the ‘Discussion Forum’ section.*
5. *Submitting the assigned tasks.*

PT [(1x(2x60”)]**Task 3:***Restating the information obtained in the form of an a-150-words paragraph.* **Moda (*Learning Management System*):**elearning@usu.ac.id | TM [(1x(2x50”)]**Kegiatan:**1. *Making notes of the learning materials explained.*
2. *Responding to the questions or instructions given.*
3. *Completing all the provided exercises individually.*
4. *Discussing the exercises completed.*

**Media:***Power Point Presentation (PPT)**Zoom Meeting* *Audio Recording**English Handout***Metode Pembelajaran:**1. *Online Lecture*
2. *Discussion*
3. *Self-Paced*

*Learning* | **Pokok Bahasan:**Konversi dan Interkoneksi Antar Parameter-Parameter Kutub 4**Referensi:*** WH. Hyat, JR., JE.Kemmerly, 1994, Rangkaian Listrik Jilid I, Penerbit Erlangga Jakarta.
* Budiono Ismail, 1997, Rangkaian Listrik Jilid Pertama, Penerbit ITB Bandung.
* Mohamad Ramdhani, 2008, Rangkaian Listrik, Penerbit Erlangga Jakarta.
* Josep A. Edminister MSE, Theory and Problem of Electric Circuits, Schaum’s Outline Series. Mc. Graw-Hill International Book Company.
* A. Bruce Carlson, 2000, CIRCUITS-Engineering Concepts and Analysis of Linier Electric Circuits, Brooks / Cole Thomson Learning.

 DLL | 5% |
| 11 | Mahasiswa menguasai tugas sebelum praktikum | 1. *The accuracy in providing the information required*
2. *The student’s fluency in reading the memo (spelling, intonation, and speed)*
3. *The correctness of the student’s answers*
 | **Kriteria:***Marking Scheme***Bentuk:***Worksheet* (Non-Tes)1. *Reading the memo provided.*
2. *Responding to the opening questions given.*
3. *Completing the table (problem-solution) according to the information in the memo.*
4. *Finding the word or phrase with similar meaning (synonym) according to the information in the memo.*

*Classifying the words or phrases with the correct headings.* | BM [(1x(2x60”)]**Kegiatan:**1. *Reviewing the previous lessons.*
2. *Reading the added learning materials.*
3. *Recording the presence.*
4. *Responding to opening questions in the ‘Discussion Forum’ section.*
5. *Submitting the assigned tasks.*

PT [(1x(2x60”)]**Task 3:***Restating the information obtained in the form of an a-150-words paragraph.* **Moda (*Learning Management System*):**elearning@usu.ac.id | TM [(1x(2x50”)]**Kegiatan:**1. *Making notes of the learning materials explained.*
2. *Responding to the questions or instructions given.*
3. *Completing all the provided exercises individually.*
4. *Discussing the exercises completed.*

**Media:***Power Point Presentation (PPT)**Zoom Meeting* *Audio Recording**English Handout***Metode Pembelajaran:**1. *Online Lecture*
2. *Discussion*
3. *Self-Paced*

*Learning* | **Pokok Bahasan:**Tugas Sebelum Praktikum**Referensi:*** WH. Hyat, JR., JE.Kemmerly, 1994, Rangkaian Listrik Jilid I, Penerbit Erlangga Jakarta.
* Budiono Ismail, 1997, Rangkaian Listrik Jilid Pertama, Penerbit ITB Bandung.
* Mohamad Ramdhani, 2008, Rangkaian Listrik, Penerbit Erlangga Jakarta.
* Josep A. Edminister MSE, Theory and Problem of Electric Circuits, Schaum’s Outline Series. Mc. Graw-Hill International Book Company.
* A. Bruce Carlson, 2000, CIRCUITS-Engineering Concepts and Analysis of Linier Electric Circuits, Brooks / Cole Thomson Learning.

 DLL | 5% |
| 12 | Mahasiswa mampu menerapkan teori praktikum melihat gelombang listrik dengan osiloskop | 1. *The accuracy in providing the information required*
2. *The student’s fluency in reading the memo (spelling, intonation, and speed)*
3. *The correctness of the student’s answers*
 | **Kriteria:***Marking Scheme***Bentuk:***Worksheet* (Non-Tes)1. *Reading the memo provided.*
2. *Responding to the opening questions given.*
3. *Completing the table (problem-solution) according to the information in the memo.*
4. *Finding the word or phrase with similar meaning (synonym) according to the information in the memo.*

*Classifying the words or phrases with the correct headings.* | BM [(1x(2x60”)]**Kegiatan:**1. *Reviewing the previous lessons.*
2. *Reading the added learning materials.*
3. *Recording the presence.*
4. *Responding to opening questions in the ‘Discussion Forum’ section.*
5. *Submitting the assigned tasks.*

PT [(1x(2x60”)]**Task 3:***Restating the information obtained in the form of an a-150-words paragraph.* **Moda (*Learning Management System*):**elearning@usu.ac.id | TM [(1x(2x50”)]**Kegiatan:**1. *Making notes of the learning materials explained.*
2. *Responding to the questions or instructions given.*
3. *Completing all the provided exercises individually.*
4. *Discussing the exercises completed.*

**Media:***Power Point Presentation (PPT)**Zoom Meeting* *Audio Recording**English Handout***Metode Pembelajaran:**1. *Online Lecture*
2. *Discussion*
3. *Self-Paced*

*Learning* | **Pokok Bahasan:**Praktikum Melihat Gelombang Listrik Dengan Osiloskop**Referensi:*** WH. Hyat, JR., JE.Kemmerly, 1994, Rangkaian Listrik Jilid I, Penerbit Erlangga Jakarta.
* Budiono Ismail, 1997, Rangkaian Listrik Jilid Pertama, Penerbit ITB Bandung.
* Mohamad Ramdhani, 2008, Rangkaian Listrik, Penerbit Erlangga Jakarta.
* Josep A. Edminister MSE, Theory and Problem of Electric Circuits, Schaum’s Outline Series. Mc. Graw-Hill International Book Company.
* A. Bruce Carlson, 2000, CIRCUITS-Engineering Concepts and Analysis of Linier Electric Circuits, Brooks / Cole Thomson Learning.

 DLL | 5% |
| 13 | Mahasiswa dapat mengerjakan latihan tentang praktikum percobaan hukum ohm, hukum kirchoff dan teorema superposisi dan transformasi wye-delta | 1. *The accuracy in providing the information required*
2. *The student’s fluency in reading the memo (spelling, intonation, and speed)*
3. *The correctness of the student’s answers*
 | **Kriteria:***Marking Scheme***Bentuk:***Worksheet* (Non-Tes)1. *Reading the memo provided.*
2. *Responding to the opening questions given.*
3. *Completing the table (problem-solution) according to the information in the memo.*
4. *Finding the word or phrase with similar meaning (synonym) according to the information in the memo.*

*Classifying the words or phrases with the correct headings.* | BM [(1x(2x60”)]**Kegiatan:**1. *Reviewing the previous lessons.*
2. *Reading the added learning materials.*
3. *Recording the presence.*
4. *Responding to opening questions in the ‘Discussion Forum’ section.*
5. *Submitting the assigned tasks.*

PT [(1x(2x60”)]**Task 3:***Restating the information obtained in the form of an a-150-words paragraph.* **Moda (*Learning Management System*):**elearning@usu.ac.id | TM [(1x(2x50”)]**Kegiatan:**1. *Making notes of the learning materials explained.*
2. *Responding to the questions or instructions given.*
3. *Completing all the provided exercises individually.*
4. *Discussing the exercises completed.*

**Media:***Power Point Presentation (PPT)**Zoom Meeting* *Audio Recording**English Handout***Metode Pembelajaran:**1. *Online Lecture*
2. *Discussion*
3. *Self-Paced*

*Learning* | **Pokok Bahasan:**Praktikum Percobaan Hukum Ohm, Hukum Kirchoff dan Teorema Superposisi dan Transformasi Wye-Delta**Referensi:*** WH. Hyat, JR., JE.Kemmerly, 1994, Rangkaian Listrik Jilid I, Penerbit Erlangga Jakarta.
* Budiono Ismail, 1997, Rangkaian Listrik Jilid Pertama, Penerbit ITB Bandung.
* Mohamad Ramdhani, 2008, Rangkaian Listrik, Penerbit Erlangga Jakarta.
* Josep A. Edminister MSE, Theory and Problem of Electric Circuits, Schaum’s Outline Series. Mc. Graw-Hill International Book Company.
* A. Bruce Carlson, 2000, CIRCUITS-Engineering Concepts and Analysis of Linier Electric Circuits, Brooks / Cole Thomson Learning.

 DLL | 5% |
| 14 | Mahasiswa memahami perkembangan teori praktikum menggunakan metode thevenin, norton, dan reaktansi, kapasitansi dan rangkaian rc seri | 1. *The accuracy in providing the information required*
2. *The student’s fluency in reading the memo (spelling, intonation, and speed)*
3. *The correctness of the student’s answers*
 | **Kriteria:***Marking Scheme***Bentuk:***Worksheet* (Non-Tes)1. *Reading the memo provided.*
2. *Responding to the opening questions given.*
3. *Completing the table (problem-solution) according to the information in the memo.*
4. *Finding the word or phrase with similar meaning (synonym) according to the information in the memo.*

*Classifying the words or phrases with the correct headings.* | BM [(1x(2x60”)]**Kegiatan:**1. *Reviewing the previous lessons.*
2. *Reading the added learning materials.*
3. *Recording the presence.*
4. *Responding to opening questions in the ‘Discussion Forum’ section.*
5. *Submitting the assigned tasks.*

PT [(1x(2x60”)]**Task 3:***Restating the information obtained in the form of an a-150-words paragraph.* **Moda (*Learning Management System*):**elearning@usu.ac.id | TM [(1x(2x50”)]**Kegiatan:**1. *Making notes of the learning materials explained.*
2. *Responding to the questions or instructions given.*
3. *Completing all the provided exercises individually.*
4. *Discussing the exercises completed.*

**Media:***Power Point Presentation (PPT)**Zoom Meeting* *Audio Recording**English Handout***Metode Pembelajaran:**1. *Online Lecture*
2. *Discussion*
3. *Self-Paced*

*Learning* | **Pokok Bahasan:**Praktikum Menggunakan Metode Thevenin, Norton, dan Reaktansi, Kapasitansi dan Rangkaian Rc Seri**Referensi:*** WH. Hyat, JR., JE.Kemmerly, 1994, Rangkaian Listrik Jilid I, Penerbit Erlangga Jakarta.
* Budiono Ismail, 1997, Rangkaian Listrik Jilid Pertama, Penerbit ITB Bandung.
* Mohamad Ramdhani, 2008, Rangkaian Listrik, Penerbit Erlangga Jakarta.
* Josep A. Edminister MSE, Theory and Problem of Electric Circuits, Schaum’s Outline Series. Mc. Graw-Hill International Book Company.
* A. Bruce Carlson, 2000, CIRCUITS-Engineering Concepts and Analysis of Linier Electric Circuits, Brooks / Cole Thomson Learning.

 DLL | 5% |
| 15 | Mahasiswa memahami praktikum resonansi | 1. *The accuracy in providing the information required*
2. *The student’s fluency in reading the memo (spelling, intonation, and speed)*
3. *The correctness of the student’s answers*
 | **Kriteria:***Marking Scheme***Bentuk:***Worksheet* (Non-Tes)1. *Reading the memo provided.*
2. *Responding to the opening questions given.*
3. *Completing the table (problem-solution) according to the information in the memo.*
4. *Finding the word or phrase with similar meaning (synonym) according to the information in the memo.*

*Classifying the words or phrases with the correct headings.* | BM [(1x(2x60”)]**Kegiatan:**1. *Reviewing the previous lessons.*
2. *Reading the added learning materials.*
3. *Recording the presence.*
4. *Responding to opening questions in the ‘Discussion Forum’ section.*
5. *Submitting the assigned tasks.*

PT [(1x(2x60”)]**Task 3:***Restating the information obtained in the form of an a-150-words paragraph.* **Moda (*Learning Management System*):**elearning@usu.ac.id | TM [(1x(2x50”)]**Kegiatan:**1. *Making notes of the learning materials explained.*
2. *Responding to the questions or instructions given.*
3. *Completing all the provided exercises individually.*
4. *Discussing the exercises completed.*

**Media:***Power Point Presentation (PPT)**Zoom Meeting* *Audio Recording**English Handout***Metode Pembelajaran:**1. *Online Lecture*
2. *Discussion*
3. *Self-Paced*

*Learning* | **Pokok Bahasan:**Praktikum Resonansi**Referensi:*** WH. Hyat, JR., JE.Kemmerly, 1994, Rangkaian Listrik Jilid I, Penerbit Erlangga Jakarta.
* Budiono Ismail, 1997, Rangkaian Listrik Jilid Pertama, Penerbit ITB Bandung.
* Mohamad Ramdhani, 2008, Rangkaian Listrik, Penerbit Erlangga Jakarta.
* Josep A. Edminister MSE, Theory and Problem of Electric Circuits, Schaum’s Outline Series. Mc. Graw-Hill International Book Company.
* A. Bruce Carlson, 2000, CIRCUITS-Engineering Concepts and Analysis of Linier Electric Circuits, Brooks / Cole Thomson Learning.
* DLL
 | 5% |
| 16 | UJIAN AKHIR SEMESTER |  |  |  |  |  | *15%* |
|  | Total  | **100** |