

# **Rencana Program dan Kegiatan Pembelajaran Semester (RPKPS)**

**Manajemen Kuantitatif Hutan Lestari**

**REG**



**Oleh:**

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**Program Studi MAGISTER ILMU KEHUTANAN  
Departemen KEHUTANAN  
Fakultas KEHUTANAN  
UNIVERSITAS GADJAH MADA  
2021 GANJIL**

# RENCANA KEGIATAN PEMBELAJARAN SEMESTER

## A. Identitas Matakuliah / *Course Detail*

1. Nama Matakuliah / *Course Name* : Manajemen Kuantitatif Hutan Lestari
2. Kode/SKS/Sifat / *Code/Credits/Status* : KTM 603/2/Pilihan (*Elective*)
3. Prasyarat / *Prerequisite* : -

Dalam mata kuliah ini dipelajari dan didiskusikan istilah dan konsep kelestarian hutan, perkembangan konsep kelestarian hutan dan syarat-syarat terwujudnya kelestarian hutan, pengertian dan konsep hutan normal, tabel hasil dan tandon hutan (*growing stock*), pengertian dan macam-macam daur/rotasi, cara menentukan daur/rotasi, berbagai sistem permudaan hutan yang biasa diterapkan demi terwujudnya kelestarian hutan, penghitungan etat berdasarkan luas, volume dan riap tegakan hutan, penghitungan etat berdasarkan pendekatan optimasi, rencana pemanenan hutan ramah lingkungan demi terwujudnya kekekalan hutan dan perusahaan hutan.
4. Deskripsi Singkat / *Short Description* :

This course puts more emphasis on the term and concept of forest sustainability, the development of sustainability concept and the requirements of the realization of a sustainable forest, concepts of normal forests, yield table and forest growing stock, various kinds of rotation, how to determine the rotation, the variety of forest regeneration that are commonly applied, annual allowable cut (AAC) calculation based on the area, volume and increments, AAC calculation based on the approach of optimization, the plan of harvesting the forest in order to realize the sustainability of forest resources and forest companies.

5. Tujuan Pembelajaran / *Learning Objective* : Pembelajaran diselenggarakan dengan tujuan meningkatkan pengetahuan dan pemahaman mahasiswa mengenai konsep kelestarian hutan perkembangan konsep kelestarian hutandan syarat-syarat terwujudnya kelestarian hutan, pengertian dan konsep tentang hutan normal, tabel hasil dan tandon hutan (growing stock), pengertian dan macam-macam daur/rotasi, cara menentukan daur/rotasi, berbagai sistem peremudaan hutan yang biasa diterapkan demi terwujudnya kelestarian hutan, penghitungan etat berdasarkan luas, volume dan riap tegakan hutan, penghitungan etat berdasarkan pendekatan optimasi, rencana pemanenan hutan ramah lingkungan demi terwujudnya kekekalan hutan dan perusahaan hutan. In this course students will explore the concepts of forest sustainability and its quantitative measurements.  
CPMK 3: Able to mathematically formulate alternative harvesting forest products and find the optimal solution  
CPMK 4: Able to evaluate and choose alternative sustainable SDH management based on harvest results, stand potential, forest value, value of standing stands, and expected value of land, as well as sustainability values (economic, social, environmental).
6. Dosen Pengampu Matakuliah / *Lecturers* : RIS HADI PURWANTO, EMMA SORAYA
7. Capaian Pembelajaran Matakuliah / *Course Learning Outcome (CPMK/CLO)* :

| Kode / Code | Deskripsi / Description                                                                                                                                                                                                                                                  | PLO/SO/ELO/CPL/LG |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| CLO 1       | able to explain and evaluate the concept of: forest sustainability, its development, prerequisite conditions for the realization of forest sustainability; normal forest, yields table, and forest growing stock; various types of rotation; forest regeneration system; | PLO 2             |
| CLO 2       | Able to determine forest rotation and quantify AAC based on area, volume, forest stand increment, and optimization approach;                                                                                                                                             | PLO 6             |
| CLO 3       | Able to mathematically formulate alternative harvesting forest products and find the optimal solution                                                                                                                                                                    | PLO 5             |
| CLO 4       | Able to evaluate and choose alternative sustainable SDH management based on harvest results, stand potential, forest value, value of standing stands, and expected value of land, as well as sustainability values (economic, social, environmental).                    | PLO 6             |

## PLO / PI Detail

|              |                                                                                                   |                                                                                                                                                                                                                                             |
|--------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PLO 2</b> | Value (responsibility, confidence, emotional maturity, ethics, lifelong learner, develop network) | <i>Having responsibility, confidence, emotional maturity, ethics, and awareness of being a lifelong learner and able to develop network.</i>                                                                                                |
| <b>PLO 6</b> | Skill (Logic, Critical, Innovative Thinking)                                                      | <i>Able to apply logical, critical, systematic and innovative thinking skills by utilizing information technology to produce solutions in form of scientific documents individually as well as in a team.</i>                               |
| <b>PLO 5</b> | Knowledge (Analyse Comprehensively in the Specific Fields)                                        | <i>Able to analyze comprehensively updated issues in the specific fields of silviculture, forest management, forest products technology or forest resource conservation, and to recommend possible solutions based on difined problems.</i> |

## B. Topik Perkuliahan / Course Materials

| <b>Bahasan / Main Discussion</b>                                                                                                 | <b>Estimasi Waktu / Estimated Times (Hour)</b> | <b>Kompetensi (Course Learning Outcomes)</b> |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------|
| Pendahuluan<br>Introduction                                                                                                      | 2                                              | CLO 1                                        |
| Definisi Manajemen Hutan, Fungsi Hutan, dan Grafik Riap<br>Definition of forest management, forest function and Increament graph | 2                                              | CLO 1                                        |
| Triangle of sustainable development                                                                                              | 2                                              | CLO 1                                        |
| Konsep Kelestarian<br>Sustainability Concept                                                                                     | 2                                              | CLO 1                                        |
| Montreal Process                                                                                                                 | 2                                              | CLO 1                                        |
| Etat                                                                                                                             | 2                                              | CLO 1                                        |
| Pengantar operation research<br>Introduction of operation research                                                               | 2                                              | CLO 2                                        |
| Pengantar operation research<br>Introduction of operation research                                                               | 2                                              | CLO 2                                        |
| Linier Programming                                                                                                               | 2                                              | CLO 4                                        |
| Manajemen hutan tanaman<br>Plantation Management                                                                                 | 2                                              | CLO 3                                        |

| <b>Bahasan / Main Discussion</b>                                 | <b>Estimasi Waktu / Estimated Times (Hour)</b> | <b>Kompetensi (Course Learning Outcomes)</b> |
|------------------------------------------------------------------|------------------------------------------------|----------------------------------------------|
| Manajemen hutan tak seumur<br>Management of Heterogeneous Forest | 2                                              | CLO 3                                        |
| Goal Programming                                                 | 2                                              | CLO 4                                        |
| Thesis: refining research questions                              | 2                                              | CLO 3                                        |

### **C. Rencana Asesmen / Assessment Plan**

| <b>CO/CPMK</b> | <b>Tipe / Type</b> | <b>Deskripsi / Description</b> | <b>Persentase / Percentage</b> | <b>PLO/SO/ELO/CPL/LG</b> |
|----------------|--------------------|--------------------------------|--------------------------------|--------------------------|
| CLO 1          | UTS                | Soal UTS 1                     | 10                             | PLO 2                    |
| CLO 1          | UTS                | Soal UTS 2                     | 15                             | PLO 2                    |
| CLO 2          | UTS                | Soal UTS 3                     | 10                             | PLO 6                    |
| CLO 2          | UTS                | Soal UTS 4                     | 15                             | PLO 6                    |
| CLO 3          | UAS                | Soal UAS 1                     | 20                             | PLO 5                    |
| CLO 3          | UAS                | Soal UAS 2                     | 10                             | PLO 5                    |
| CLO 4          | UAS                | Soal UAS 3                     | 20                             | PLO 6                    |

### **D. Referensi / References**

Leuschner, W.A. 1984. Introduction to Forest Regulation. John Wiley & Sons, New York.

Clutter J.L. at al., 1983. Timber Management: A Quantitative Approach. John Wiley & Sons, New York.

Knuchel, H. 1953. Planning and Control in the Managed Forest. Oliver & Boyd, London: 98 Great Russel Street, W.C.

Davis, K.P. 1952. Forest Management: Regulation and Valuation. McGraw-Hill- Company, New York

Davis, L. S., Johnson, K. N., Bettinger, P., & Howard, T. E. Forest management: to sustain ecological, economic, and social values . 2001. New York.

Bettinger, P., Boston, K., Siry, J. P., & Grebner, D. L. (2016). Forest management and planning.

Buongiorno J., Gilles KJ., 2003. Decision Methods for Forest Management. Academic Press.

### **E. Rencana Kegiatan Pembelajaran Mingguan (RKPM) / Weakly Teaching Plan**

| Pertemuan<br>Ke / Week | Tujuan Ajar /<br>Learning<br>Objective                                                           | Topik / Topic                   | Media<br>Ajar /<br>Teaching<br>Media      | Metode<br>Assesment<br>/<br>Assesment<br>Method                     | Metode<br>Ajar /<br>Teaching<br>Method                  | Aktivitas<br>Mahasiswa<br>/ Student<br>Activity                                                    | Aktivitas<br>Dosen /<br>Lecturer<br>Activity                                                                                 | Sumber Ajar /<br>Learning<br>Resources                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------|--------------------------------------------------------------------------------------------------|---------------------------------|-------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                      | Dapat menjelaskan Ruang Lingkup Manajemen Kuantitatif Hutan Lestari<br><br>can explain all about | Pendahuluan<br><br>Introduction | Classroom, LCD Projector, Internet Access | Tanya jawab dalam kelas<br><br>Question and Answer in the classroom | Penjelasan di kelas<br><br>Explanation in the classroom | Menyiapkan pustaka terkait sesuai silabus<br><br>Preparing related libraries According to syllabus | Menyiapkan materi berupa pustaka dan file presentasi<br><br>Prepare material in the form of libraries and presentation files | Leuschner, W.A. 1984. Introduction to Forest Regulation. John Wiley & Sons, New York.<br>Clutter J.L. at al., 1983. Timber Management: A Quantitative Approach. John Wiley & Sons, New York.<br>Knuchel, H. 1953. Planning and Control in the Managed Forest. Oliver & Boyd, London: 98 Great Russel Street, W.C.<br>Davis, K.P. 1952. Forest Management: Regulation and Valuation. McGraw-Hill-Company, New York<br><br>Davis, L. S., Johnson, K. N., Bettinger, P., & Howard, T. E. Forest management: to sustain ecological, economic, and social values . 2001. New York.<br><br>Bettinger, P., Boston, K., Siry, J. P., & Grebner, D. L. (2016). Forest management and planning.<br><br>Buongiorno J., Gilles KJ., 2003. Decision Methods for Forest Management. Academic Press. |

| Pertemuan<br>Ke / Week | Tujuan Ajar /<br>Learning<br>Objective                                                                                                                                        | Topik / Topic                                                                                                                               | Media<br>Ajar /<br>Teaching<br>Media      | Metode<br>Assesment<br>/<br>Assesment<br>Method | Metode<br>Ajar /<br>Teaching<br>Method                         | Aktivitas<br>Mahasiswa<br>/ Student<br>Activity                                                           | Aktivitas<br>Dosen /<br>Lecturer<br>Activity                                                                                        | Sumber Ajar /<br>Learning<br>Resources                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2                      | <p>Dapat menjelaskan Definisi Manajemen Hutan, Fungsi Hutan, dan Grafik Riap</p> <p>can explain the Definition of forest management, forest function and Increament graph</p> | <p>Definisi Manajemen Hutan, Fungsi Hutan, dan Grafik Riap</p> <p>Definition of forest management, forest function and Increament graph</p> | Classroom, LCD Projector, Internet Access | Pemberian tugas resume paper di jurnal          | <p>Penjelasan di kelas</p> <p>Explanation in the classroom</p> | <p>Menyiapkan pustaka terkait sesuai silabus</p> <p>Preparing related libraries According to syllabus</p> | <p>Menyiapkan materi berupa pustaka dan file presentasi</p> <p>Prepare material in the form of libraries and presentation files</p> | <p>Leuschner, W.A. 1984. Introduction to Forest Regulation. John Wiley &amp; Sons, New York.</p> <p>Clutter J.L. at al., 1983. Timber Management: A Quantitative Approach. John Wiley &amp; Sons, New York.</p> <p>Knuchel, H. 1953. Planning and Control in the Managed Forest. Oliver &amp; Boyd, London: 98 Great Russel Street, W.C.</p> <p>Davis, K.P. 1952. Forest Management: Regulation and Valuation. McGraw-Hill-Company, New York</p> <p>Davis, L. S., Johnson, K. N., Bettinger, P., &amp; Howard, T. E. Forest management: to sustain ecological, economic, and social values . 2001. New York.</p> <p>Bettinger, P., Boston, K., Siry, J. P., &amp; Grebner, D. L. (2016). Forest management and planning.</p> <p>Buongiorno J., Gilles KJ., 2003. Decision Methods for Forest Management. Academic Press.</p> |

| <b>Pertemuan<br/>Ke / Week</b> | <b>Tujuan Ajar /<br/>Learning<br/>Objective</b>                                                                         | <b>Topik / Topic</b>                | <b>Media<br/>Ajar /<br/>Teaching<br/>Media</b> | <b>Metode<br/>Assesment<br/>/<br/>Assesment<br/>Method</b>          | <b>Metode<br/>Ajar /<br/>Teaching<br/>Method</b> | <b>Aktivitas<br/>Mahasiswa<br/>/ Student<br/>Activity</b> | <b>Aktivitas<br/>Dosen /<br/>Lecturer<br/>Activity</b>                 | <b>Sumber Ajar /<br/>Learning<br/>Resources</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------------------------|---------------------------------------------------------------------|--------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3                              | Dapat menjelaskan konsep Triangle of sustainable development<br><br>can explain the Triangle of sustainable development | Triangle of sustainable development | Classroom, LCD Projector, Internet Access      | Tanya jawab dalam kelas<br><br>Question and Answer in the classroom | Diskusi kelompok<br><br>Group discussion         | Mahasiswa berdiskusi<br><br>Group discussion              | Memberi pengarahan dalam diskusi<br><br>Provide guidance in discussion | <p>Leuschner, W.A. 1984. Introduction to Forest Regulation. John Wiley &amp; Sons, New York.</p> <p>Clutter J.L. at al., 1983. Timber Management: A Quantitative Approach. John Wiley &amp; Sons, New York.</p> <p>Knuchel, H. 1953. Planning and Control in the Managed Forest. Oliver &amp; Boyd, London: 98 Great Russel Street, W.C.</p> <p>Davis, K.P. 1952. Forest Management: Regulation and Valuation. McGraw-Hill-Company, New York</p> <p>Davis, L. S., Johnson, K. N., Bettinger, P., &amp; Howard, T. E. Forest management: to sustain ecological, economic, and social values . 2001. New York.</p> <p>Bettinger, P., Boston, K., Siry, J. P., &amp; Grebner, D. L. (2016). Forest management and planning.</p> <p>Buongiorno J., Gilles KJ., 2003. Decision Methods for Forest Management. Academic Press.</p> |



| <b>Pertemuan<br/>Ke / Week</b> | <b>Tujuan Ajar /<br/>Learning<br/>Objective</b>                                       | <b>Topik / Topic</b>                                | <b>Media<br/>Ajar /<br/>Teaching<br/>Media</b> | <b>Metode<br/>Assesment<br/>/<br/>Assesment<br/>Method</b> | <b>Metode<br/>Ajar /<br/>Teaching<br/>Method</b>        | <b>Aktivitas<br/>Mahasiswa<br/>/ Student<br/>Activity</b> | <b>Aktivitas<br/>Dosen /<br/>Lecturer<br/>Activity</b>                                                                       | <b>Sumber Ajar /<br/>Learning<br/>Resources</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------|------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4                              | Dapat menjelaskan Konsep Kelestarian<br><br>can explain the Concept of Sustainability | Konsep Kelestarian<br><br>Concept of Sustainability | Classroom, LCD Projector, Internet Access      | Quiz                                                       | Penjelasan di kelas<br><br>Explanation in the classroom | Membaca pustaka<br><br>Reading the literature             | Menyiapkan materi berupa pustaka dan file presentasi<br><br>Prepare material in the form of libraries and presentation files | <p>Leuschner, W.A. 1984. Introduction to Forest Regulation. John Wiley &amp; Sons, New York.</p> <p>Clutter J.L. at al., 1983. Timber Management: A Quantitative Approach. John Wiley &amp; Sons, New York.</p> <p>Knuchel, H. 1953. Planning and Control in the Managed Forest. Oliver &amp; Boyd, London: 98 Great Russel Street, W.C.</p> <p>Davis, K.P. 1952. Forest Management: Regulation and Valuation. McGraw-Hill-Company, New York</p> <p>Davis, L. S., Johnson, K. N., Bettinger, P., &amp; Howard, T. E. Forest management: to sustain ecological, economic, and social values . 2001. New York.</p> <p>Bettinger, P., Boston, K., Siry, J. P., &amp; Grebner, D. L. (2016). Forest management and planning.</p> <p>Buongiorno J., Gilles KJ., 2003. Decision Methods for Forest Management. Academic Press.</p> |

| <b>Pertemuan<br/>Ke / Week</b> | <b>Tujuan Ajar /<br/>Learning<br/>Objective</b>                            | <b>Topik / Topic</b> | <b>Media<br/>Ajar /<br/>Teaching<br/>Media</b> | <b>Metode<br/>Assesment<br/>/<br/>Assesment<br/>Method</b>          | <b>Metode<br/>Ajar /<br/>Teaching<br/>Method</b>        | <b>Aktivitas<br/>Mahasiswa<br/>/ Student<br/>Activity</b> | <b>Aktivitas<br/>Dosen /<br/>Lecturer<br/>Activity</b>                                                                       | <b>Sumber Ajar /<br/>Learning<br/>Resources</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| 5                              | Dapat menjelaskan Montreal Process<br><br>can explain the Montreal Process | Montreal Process     | Classroom, LCD Projector, Internet Access      | Tanya jawab dalam kelas<br><br>Question and Answer in the classroom | Penjelasan di kelas<br><br>Explanation in the classroom | Membaca pustaka<br><br>Reading the literature             | Menyiapkan materi berupa pustaka dan file presentasi<br><br>Prepare material in the form of libraries and presentation files | <p>Leuschner, W.A. 1984. Introduction to Forest Regulation. John Wiley &amp; Sons, New York.</p> <p>Clutter J.L. at al., 1983. Timber Management: A Quantitative Approach. John Wiley &amp; Sons, New York.</p> <p>Knuchel, H. 1953. Planning and Control in the Managed Forest. Oliver &amp; Boyd, London: 98 Great Russel Street, W.C.</p> <p>Davis, K.P. 1952. Forest Management: Regulation and Valuation. McGraw-Hill-Company, New York</p> <p>Davis, L. S., Johnson, K. N., Bettinger, P., &amp; Howard, T. E. Forest management: to sustain ecological, economic, and social values . 2001. New York.</p> <p>Bettinger, P., Boston, K., Siry, J. P., &amp; Grebner, D. L. (2016). Forest management and planning.</p> <p>Buongiorno J., Gilles KJ., 2003. Decision Methods for Forest Management. Academic Press.</p> |

| <b>Pertemuan<br/>Ke / Week</b> | <b>Tujuan Ajar /<br/>Learning<br/>Objective</b>    | <b>Topik / Topic</b> | <b>Media<br/>Ajar /<br/>Teaching<br/>Media</b> | <b>Metode<br/>Assesment<br/>/<br/>Assesment<br/>Method</b>                                     | <b>Metode<br/>Ajar /<br/>Teaching<br/>Method</b>        | <b>Aktivitas<br/>Mahasiswa<br/>/ Student<br/>Activity</b> | <b>Aktivitas<br/>Dosen /<br/>Lecturer<br/>Activity</b>                                                                       | <b>Sumber Ajar /<br/>Learning<br/>Resources</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------|----------------------------------------------------|----------------------|------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6                              | Dapat menjelaskan Etat<br><br>can explain the Etat | Etat                 | Classroom, LCD Projector, Internet Access      | Pemberian tugas resume paper di jurnal<br><br>Delivery of resume paper assignments in journals | Penjelasan di kelas<br><br>Explanation in the classroom | Membaca pustaka<br><br>Reading the literature             | Menyiapkan materi berupa pustaka dan file presentasi<br><br>Prepare material in the form of libraries and presentation files | <p>Leuschner, W.A. 1984. Introduction to Forest Regulation. John Wiley &amp; Sons, New York.</p> <p>Clutter J.L. at al., 1983. Timber Management: A Quantitative Approach. John Wiley &amp; Sons, New York.</p> <p>Knuchel, H. 1953. Planning and Control in the Managed Forest. Oliver &amp; Boyd, London: 98 Great Russel Street, W.C.</p> <p>Davis, K.P. 1952. Forest Management: Regulation and Valuation. McGraw-Hill-Company, New York</p> <p>Davis, L. S., Johnson, K. N., Bettinger, P., &amp; Howard, T. E. Forest management: to sustain ecological, economic, and social values . 2001. New York.</p> <p>Bettinger, P., Boston, K., Siry, J. P., &amp; Grebner, D. L. (2016). Forest management and planning.</p> <p>Buongiorno J., Gilles KJ., 2003. Decision Methods for Forest Management. Academic Press.</p> |

| <b>Pertemuan<br/>Ke / Week</b> | <b>Tujuan Ajar /<br/>Learning<br/>Objective</b>                                                                 | <b>Topik / Topic</b>                                                          | <b>Media<br/>Ajar /<br/>Teaching<br/>Media</b> | <b>Metode<br/>Assesment<br/>/<br/>Assesment<br/>Method</b>                 | <b>Metode<br/>Ajar /<br/>Teaching<br/>Method</b> | <b>Aktivitas<br/>Mahasiswa<br/>/ Student<br/>Activity</b> | <b>Aktivitas<br/>Dosen /<br/>Lecturer<br/>Activity</b>                        | <b>Sumber Ajar /<br/>Learning<br/>Resources</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| 7                              | <p>Dapat menjelaskan Pengantar operation research</p> <p>can explain the Introduction of operation research</p> | <p>Pengantar operation research</p> <p>Introduction of operation research</p> | Classroom, LCD Projector, Internet Access      | <p>Tanya jawab dalam kelas</p> <p>Question and Answer in the classroom</p> | <p>Diskusi kelompok</p> <p>Group discussion</p>  | <p>Mahasiswa berdiskusi</p> <p>Group discussion</p>       | <p>Memberi pengarahan dalam diskusi</p> <p>Provide guidance in discussion</p> | <p>Leuschner, W.A. 1984. Introduction to Forest Regulation. John Wiley &amp; Sons, New York.</p> <p>Clutter J.L. at al., 1983. Timber Management: A Quantitative Approach. John Wiley &amp; Sons, New York.</p> <p>Knuchel, H. 1953. Planning and Control in the Managed Forest. Oliver &amp; Boyd, London: 98 Great Russel Street, W.C.</p> <p>Davis, K.P. 1952. Forest Management: Regulation and Valuation. McGraw-Hill-Company, New York</p> <p>Davis, L. S., Johnson, K. N., Bettinger, P., &amp; Howard, T. E. Forest management: to sustain ecological, economic, and social values . 2001. New York.</p> <p>Bettinger, P., Boston, K., Siry, J. P., &amp; Grebner, D. L. (2016). Forest management and planning.</p> <p>Buongiorno J., Gilles KJ., 2003. Decision Methods for Forest Management. Academic Press.</p> |

| <b>Pertemuan<br/>Ke / Week</b> | <b>Tujuan Ajar /<br/>Learning<br/>Objective</b>                                                                 | <b>Topik / Topic</b>                                                          | <b>Media<br/>Ajar /<br/>Teaching<br/>Media</b>   | <b>Metode<br/>Assesment<br/>/<br/>Assesment<br/>Method</b>     | <b>Metode<br/>Ajar /<br/>Teaching<br/>Method</b>     | <b>Aktivitas<br/>Mahasiswa<br/>/ Student<br/>Activity</b> | <b>Aktivitas<br/>Dosen /<br/>Lecturer<br/>Activity</b>                                                                              | <b>Sumber Ajar /<br/>Learning<br/>Resources</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|--------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8                              | <p>Dapat menjelaskan Pengantar operation research</p> <p>can explain the Introduction of operation research</p> | <p>Pengantar operation research</p> <p>Introduction of operation research</p> | <p>Classroom, LCD Projector, Internet Access</p> | <p>Penjelasan di kelas</p> <p>Explanation in the classroom</p> | <p>Membaca pustaka</p> <p>Reading the literature</p> | <p>Membaca pustaka</p> <p>Reading the literature</p>      | <p>Menyiapkan materi berupa pustaka dan file presentasi</p> <p>Prepare material in the form of libraries and presentation files</p> | <p>Leuschner, W.A. 1984. Introduction to Forest Regulation. John Wiley &amp; Sons, New York.</p> <p>Clutter J.L. at al., 1983. Timber Management: A Quantitative Approach. John Wiley &amp; Sons, New York.</p> <p>Knuchel, H. 1953. Planning and Control in the Managed Forest. Oliver &amp; Boyd, London: 98 Great Russel Street, W.C.</p> <p>Davis, K.P. 1952. Forest Management: Regulation and Valuation. McGraw-Hill-Company, New York</p> <p>Davis, L. S., Johnson, K. N., Bettinger, P., &amp; Howard, T. E. Forest management: to sustain ecological, economic, and social values . 2001. New York.</p> <p>Bettinger, P., Boston, K., Siry, J. P., &amp; Grebner, D. L. (2016). Forest management and planning.</p> <p>Buongiorno J., Gilles KJ., 2003. Decision Methods for Forest Management. Academic Press.</p> |

| <b>Pertemuan<br/>Ke / Week</b> | <b>Tujuan Ajar /<br/>Learning<br/>Objective</b>                                | <b>Topik / Topic</b> | <b>Media<br/>Ajar /<br/>Teaching<br/>Media</b> | <b>Metode<br/>Assesment<br/>/<br/>Assesment<br/>Method</b>          | <b>Metode<br/>Ajar /<br/>Teaching<br/>Method</b>        | <b>Aktivitas<br/>Mahasiswa<br/>/ Student<br/>Activity</b> | <b>Aktivitas<br/>Dosen /<br/>Lecturer<br/>Activity</b>                                                                       | <b>Sumber Ajar /<br/>Learning<br/>Resources</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------|--------------------------------------------------------------------------------|----------------------|------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9                              | Dapat menjelaskan Linier Programming<br><br>can explain the Linier Programming | Linier Programming   | Classroom, LCD Projector, Internet Access      | Tanya jawab dalam kelas<br><br>Question and Answer in the classroom | Penjelasan di kelas<br><br>Explanation in the classroom | Membaca pustaka<br><br>Reading the literature             | Menyiapkan materi berupa pustaka dan file presentasi<br><br>Prepare material in the form of libraries and presentation files | <p>Leuschner, W.A. 1984. Introduction to Forest Regulation. John Wiley &amp; Sons, New York.</p> <p>Clutter J.L. at al., 1983. Timber Management: A Quantitative Approach. John Wiley &amp; Sons, New York.</p> <p>Knuchel, H. 1953. Planning and Control in the Managed Forest. Oliver &amp; Boyd, London: 98 Great Russel Street, W.C.</p> <p>Davis, K.P. 1952. Forest Management: Regulation and Valuation. McGraw-Hill-Company, New York</p> <p>Davis, L. S., Johnson, K. N., Bettinger, P., &amp; Howard, T. E. Forest management: to sustain ecological, economic, and social values . 2001. New York.</p> <p>Bettinger, P., Boston, K., Siry, J. P., &amp; Grebner, D. L. (2016). Forest management and planning.</p> <p>Buongiorno J., Gilles KJ., 2003. Decision Methods for Forest Management. Academic Press.</p> |

| Pertemuan<br>Ke / Week | Tujuan Ajar /<br>Learning<br>Objective                                                 | Topik / Topic                                        | Media<br>Ajar /<br>Teaching<br>Media      | Metode<br>Assesment<br>/<br>Assesment<br>Method                                                | Metode<br>Ajar /<br>Teaching<br>Method                  | Aktivitas<br>Mahasiswa<br>/ Student<br>Activity | Aktivitas<br>Dosen /<br>Lecturer<br>Activity                                                                                 | Sumber Ajar /<br>Learning<br>Resources                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------|-------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10                     | Dapat menjelaskan Manajemen hutan tanaman<br><br>can explain the Plantation Management | Manajemen hutan tanaman<br><br>Plantation Management | Classroom, LCD Projector, Internet Access | Pemberian tugas resume paper di jurnal<br><br>Delivery of resume paper assignments in journals | Penjelasan di kelas<br><br>Explanation in the classroom | Membaca pustaka<br><br>Reading the literature   | Menyiapkan materi berupa pustaka dan file presentasi<br><br>Prepare material in the form of libraries and presentation files | <p>Leuschner, W.A. 1984. Introduction to Forest Regulation. John Wiley &amp; Sons, New York.</p> <p>Clutter J.L. at al., 1983. Timber Management: A Quantitative Approach. John Wiley &amp; Sons, New York.</p> <p>Knuchel, H. 1953. Planning and Control in the Managed Forest. Oliver &amp; Boyd, London: 98 Great Russel Street, W.C.</p> <p>Davis, K.P. 1952. Forest Management: Regulation and Valuation. McGraw-Hill-Company, New York</p> <p>Davis, L. S., Johnson, K. N., Bettinger, P., &amp; Howard, T. E. Forest management: to sustain ecological, economic, and social values . 2001. New York.</p> <p>Bettinger, P., Boston, K., Siry, J. P., &amp; Grebner, D. L. (2016). Forest management and planning.</p> <p>Buongiorno J., Gilles KJ., 2003. Decision Methods for Forest Management. Academic Press.</p> |

| <b>Pertemuan<br/>Ke / Week</b> | <b>Tujuan Ajar /<br/>Learning<br/>Objective</b>                                                               | <b>Topik / Topic</b>                                                        | <b>Media<br/>Ajar /<br/>Teaching<br/>Media</b> | <b>Metode<br/>Assesment<br/>/<br/>Assesment<br/>Method</b>                 | <b>Metode<br/>Ajar /<br/>Teaching<br/>Method</b> | <b>Aktivitas<br/>Mahasiswa<br/>/ Student<br/>Activity</b> | <b>Aktivitas<br/>Dosen /<br/>Lecturer<br/>Activity</b>                        | <b>Sumber Ajar /<br/>Learning<br/>Resources</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11                             | <p>Dapat menjelaskan Manajemen hutan tak seumur</p> <p>can explain the Management of Heterogeneous Forest</p> | <p>Manajemen hutan tak seumur</p> <p>Management of Heterogeneous Forest</p> | Classroom, LCD Projector, Internet Access      | <p>Tanya jawab dalam kelas</p> <p>Question and Answer in the classroom</p> | <p>Diskusi kelompok</p> <p>Group discussion</p>  | <p>Mahasiswa berdiskusi</p> <p>Group discussion</p>       | <p>Memberi pengarahan dalam diskusi</p> <p>Provide guidance in discussion</p> | <p>Leuschner, W.A. 1984. Introduction to Forest Regulation. John Wiley &amp; Sons, New York.</p> <p>Clutter J.L. at al., 1983. Timber Management: A Quantitative Approach. John Wiley &amp; Sons, New York.</p> <p>Knuchel, H. 1953. Planning and Control in the Managed Forest. Oliver &amp; Boyd, London: 98 Great Russel Street, W.C.</p> <p>Davis, K.P. 1952. Forest Management: Regulation and Valuation. McGraw-Hill-Company, New York</p> <p>Davis, L. S., Johnson, K. N., Bettinger, P., &amp; Howard, T. E. Forest management: to sustain ecological, economic, and social values . 2001. New York.</p> <p>Bettinger, P., Boston, K., Siry, J. P., &amp; Grebner, D. L. (2016). Forest management and planning.</p> <p>Buongiorno J., Gilles KJ., 2003. Decision Methods for Forest Management. Academic Press.</p> |



| <b>Pertemuan<br/>Ke / Week</b> | <b>Tujuan Ajar /<br/>Learning<br/>Objective</b>                            | <b>Topik / Topic</b> | <b>Media<br/>Ajar /<br/>Teaching<br/>Media</b> | <b>Metode<br/>Assesment<br/>/<br/>Assesment<br/>Method</b>                                     | <b>Metode<br/>Ajar /<br/>Teaching<br/>Method</b>        | <b>Aktivitas<br/>Mahasiswa<br/>/ Student<br/>Activity</b> | <b>Aktivitas<br/>Dosen /<br/>Lecturer<br/>Activity</b>                                                                       | <b>Sumber Ajar /<br/>Learning<br/>Resources</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------|----------------------------------------------------------------------------|----------------------|------------------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12                             | Dapat menjelaskan Goal Programming<br><br>can explain the Goal Programming | Goal Programming     | Classroom, LCD Projector, Internet Access      | Pemberian tugas resume paper di jurnal<br><br>Delivery of resume paper assignments in journals | Penjelasan di kelas<br><br>Explanation in the classroom | Membaca pustaka<br><br>Reading the literature             | Menyiapkan materi berupa pustaka dan file presentasi<br><br>Prepare material in the form of libraries and presentation files | <p>Leuschner, W.A. 1984. Introduction to Forest Regulation. John Wiley &amp; Sons, New York.</p> <p>Clutter J.L. at al., 1983. Timber Management: A Quantitative Approach. John Wiley &amp; Sons, New York.</p> <p>Knuchel, H. 1953. Planning and Control in the Managed Forest. Oliver &amp; Boyd, London: 98 Great Russel Street, W.C.</p> <p>Davis, K.P. 1952. Forest Management: Regulation and Valuation. McGraw-Hill-Company, New York</p> <p>Davis, L. S., Johnson, K. N., Bettinger, P., &amp; Howard, T. E. Forest management: to sustain ecological, economic, and social values . 2001. New York.</p> <p>Bettinger, P., Boston, K., Siry, J. P., &amp; Grebner, D. L. (2016). Forest management and planning.</p> <p>Buongiorno J., Gilles KJ., 2003. Decision Methods for Forest Management. Academic Press.</p> |

| <b>Pertemuan<br/>Ke / Week</b> | <b>Tujuan Ajar /<br/>Learning<br/>Objective</b>                                                                          | <b>Topik / Topic</b>                | <b>Media<br/>Ajar /<br/>Teaching<br/>Media</b> | <b>Metode<br/>Assesment<br/>/<br/>Assesment<br/>Method</b>                                            | <b>Metode<br/>Ajar /<br/>Teaching<br/>Method</b>               | <b>Aktivitas<br/>Mahasiswa<br/>/ Student<br/>Activity</b> | <b>Aktivitas<br/>Dosen /<br/>Lecturer<br/>Activity</b>                                                                              | <b>Sumber Ajar /<br/>Learning<br/>Resources</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13                             | <p>Dapat menjelaskan, Thesis: refining research questions</p> <p>can explain the Thesis: refining research questions</p> | Thesis: refining research questions | Classroom, LCD Projector, Internet Access      | <p>Pemberian tugas resume paper di jurnal</p> <p>Delivery of resume paper assignments in journals</p> | <p>Penjelasan di kelas</p> <p>Explanation in the classroom</p> | <p>Membaca pustaka</p> <p>Reading the literature</p>      | <p>Menyiapkan materi berupa pustaka dan file presentasi</p> <p>Prepare material in the form of libraries and presentation files</p> | <p>Leuschner, W.A. 1984. Introduction to Forest Regulation. John Wiley &amp; Sons, New York.</p> <p>Clutter J.L. at al., 1983. Timber Management: A Quantitative Approach. John Wiley &amp; Sons, New York.</p> <p>Knuchel, H. 1953. Planning and Control in the Managed Forest. Oliver &amp; Boyd, London: 98 Great Russel Street, W.C.</p> <p>Davis, K.P. 1952. Forest Management: Regulation and Valuation. McGraw-Hill-Company, New York</p> <p>Davis, L. S., Johnson, K. N., Bettinger, P., &amp; Howard, T. E. Forest management: to sustain ecological, economic, and social values . 2001. New York.</p> <p>Bettinger, P., Boston, K., Siry, J. P., &amp; Grebner, D. L. (2016). Forest management and planning.</p> <p>Buongiorno J., Gilles KJ., 2003. Decision Methods for Forest Management. Academic Press.</p> |