

Perkerasan Jalan Lanjut

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Description of this course

• *After the construction period ends, a pavement will be used by heavy traffic that causes the decreases the its condition. If it is not identified in the early stage, this deterioration will affect the usability of the road, as well as causing significant damage that can even endanger road users.*

• *After studying how to design pavement in Pavement Engineering course (MK Perkerasan Jalan Raya), the students of Civil Engineering UNS will continue to learn about how to measure and identify the pavement's performance.*

• *This will be begun by learning about the characteristics and weaknesses of the pavement materials, followed by introducing the model of the decreasing performance of the pavement's materials as well as the pavement. In the end, the students will learn the ways to measure the road's performance and the pavement's service life.*

Pavements' Performance

Bitumen
Bitumen + Sand
Bitumen + Sand + Aggregate

Learning outcomes

After finishing this course, the students will be able to:

- 1. Identify the weaknesses of the materials for flexible pavement and the needs to eliminate these weaknesses. (LO4)*
- 2. Identify the methods and latest engineering techniques to increase the performance of flexible pavement from the binder level, the mastic, the mortar, to the mixture. (LO4, LO11)*
- 3. Discuss and communicate the latest issues on the road deterioration and the roles of all stakeholders in solving these issues. The discussion is carried out by pushing the student's ability to think critically to solve the problem at hand. (LO9)*

TOPIK

Sub-topik

| Minggu Week | Topik Topic | Subtopik Subtopic |
|----------------|---|---|
| 1 | Introduction | - Introduction - RPS, Syllaby - Pengantar binder |
| 2 | Modifikasi binder Modified binders | - Kelemahan binder yang harus diantisipasi - Modifikasi binder dengan polimer - Modifikasi binder dengan bahan lain |
| 3 | Binder alam Natural Binders | - Aspal alam dan sifat sifatnya - Aspal alam Indonesia (asbuton) - Usaha peningkatan karakteristik aspal alam di lab jalan UNS (Semarbut) |
| 4 | Binder buatan Artificial binders | - Usaha ekologis pengurangan eksplotasi energy fosil - Aspal buatan dunia - Aspal buatan: Damar aspal - Usaha peningkatan karakteristik aspal buatan di lab jalan UNS (Daspal) |
| 5 | Karakteristik dan performance binder alam, buatan dan modifikasi The characteristics and performances of natural, artificial, and modified binders | - Karakteristik mekanik bitumen - Uji skala binder - Update hasil penelitian UNS dan international |
| 6 | Campuran aspal Asphalt mixture | - Karakteristik campuran aspal - Sifat sifat mekanistik campuran aspal |
| 7 | Ketahanan terhadap fatigue dan permanent deformation Resistance against fatigue and permanent deformation | - From binder to mixture |
| 8 | Ujian Tengah Semester Midterm Exam | Evaluasi capaian pembelajaran mahasiswa untuk tatap muka ke-1 s/d 7 |

TOPIK Sub-topik

| Minggu Week | Topik Topic | Subtopik Subtopic |
|----------------|---|--|
| 9 | MEPDG Mechanistic-Empirical Pavement Design Guide | - Sekilas tentang desain perkerasan jalan dengan pendekatan mechanistic empirical (MEPDG, Mechanistic-Empirical Pavement Design Guide) |
| 10 | Respon perkerasan Response of pavement | - Respon perkerasan akibat pembebanan - Kerusakan yang terjadi akibat pembebanan |
| 11 | Respon perkerasan Response of pavement | - Jenis dan penyebab kerusakan |
| 12 | Penilaian kondisi jalan Assesing a road's condition | - Fungsional - Structural |
| 13 | Umur layan Service life | - Estimasi nilai sisa umur layan berdasarkan survai visual - Estimasi nilai sisa umur layan berdasarkan metode empiris |
| 14 | Presentasi tugas kelompok Group work: Presentation | - Tugas penilaian kondisi jalan di Solo |
| 15 | Presentasi tugas kelompok Group work: Presentation | - Tugas penilaian kondisi jalan daerah |
| 16 | Ujian Akhir Semester Final Exam | Evaluasi capaian belajar mahasiswa dari pertemuan 9 sd 15 |

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- 1. A.A.A. Molenaar, Durable and Sustainable Road Constructions for Developing Countries**
- 2. Australia Indonesia partnership, Indonesia Infrastructure Initiative, Report on Road Sector Development Programme Package**
- 3. Pavement Design Supplement: Part II, Rehabilitation And Recycling Of Flexible Pavements, May 2011**
- 4. A.J.N. Lewis, Developments In Road Pavement Recycling In The Far East, Proceedings of the 8th Conference on Asphalt Pavements for Southern Africa (CAPSA 2004)**
- 5. Kim J Jenkins, South Africa's approach to LVR's, Lecture presentation TUDelft Univ, 20 Dec 2010**

REFERENCES