



Universitas Negeri Surabaya
Fakultas Matematika dan Ilmu Pengetahuan Alam
Program Studi S1 Fisika

Kode Dokumen

RENCANA PEMBELAJARAN SEMESTER

| MATA KULIAH (MK) | KODE | Rumpun MK | BOBOT (sks) | | | SEMESTER | Tgl Penyusunan | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| TERMODINAMIKA BAHAN | 4520102234 | Mata Kuliah Pilihan Program Studi | T=2 | P=0 | ECTS=3.18 | 6 | 25 November 2024 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OTORISASI | Pengembang RPS | | Koordinator RMK | | | Koordinator Program Studi | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | Prof. Dr. Munasir, S.Si., M.Si. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Model Pembelajaran | Project Based Learning | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capaian Pembelajaran (CP) | CPL-PRODI yang dibebankan pada MK | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CPL-3 | Mengembangkan pemikiran logis, kritis, sistematis, dan kreatif dalam melakukan pekerjaan yang spesifik di bidang keahliannya serta sesuai dengan standar kompetensi kerja bidang yang bersangkutan | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CPL-7 | Menguasai pengetahuan tentang teknologi yang berdasarkan Fisika dan penerapannya. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Capaian Pembelajaran Mata Kuliah (CPMK) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CPMK - 1 | Mastering theoretical concepts in the field of physics knowledge in general and theoretical concepts in particular the diffusion process, phase diagrams and phase transformations in depth, and able to formulate procedural problem solving | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CPMK - 2 | Implement higher order thinking processes (critical, creative, logical, and problem solving) in Lecture diffusion processes, phase diagrams and phase transformations both inductively and deductively | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CPMK - 3 | Using symbolic and numerical language creatively in describing the process of diffusion and phase change qualitatively and quantitatively | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CPMK - 4 | Utilizing information and communication technology for the benefit of strengthening and disseminating scientific products of physics by searching relevant journals that discuss diffusion processes, phase diagrams and phase transformations (ICT literacy and Technology Skills) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CPMK - 5 | Mastering the material, structure, and concepts of physics and their application in technology | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Matrik CPL - CPMK | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>CPMK</th> <th>CPL-3</th> <th>CPL-7</th> </tr> </thead> <tbody> <tr><td>CPMK-1</td><td></td><td></td></tr> <tr><td>CPMK-2</td><td></td><td></td></tr> <tr><td>CPMK-3</td><td></td><td></td></tr> <tr><td>CPMK-4</td><td></td><td style="text-align: center;">✓</td></tr> <tr><td>CPMK-5</td><td></td><td style="text-align: center;">✓</td></tr> </tbody> </table> | | | | | | CPMK | CPL-3 | CPL-7 | CPMK-1 | | | CPMK-2 | | | CPMK-3 | | | CPMK-4 | | ✓ | CPMK-5 | | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CPMK | CPL-3 | CPL-7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CPMK-1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CPMK-2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CPMK-3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CPMK-4 | | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CPMK-5 | | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Matrik CPMK pada Kemampuan akhir tiap tahapan belajar (Sub-CPMK) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">CPMK</th> <th colspan="16">Minggu Ke</th> </tr> <tr> <th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10</th><th>11</th><th>12</th><th>13</th><th>14</th><th>15</th><th>16</th> </tr> </thead> <tbody> <tr><td>CPMK-1</td><td style="text-align: center;">✓</td><td style="text-align: center;">✓</td><td style="text-align: center;">✓</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>CPMK-2</td><td></td><td></td><td></td><td style="text-align: center;">✓</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>CPMK-3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>CPMK-4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td style="text-align: center;">✓</td><td style="text-align: center;">✓</td><td style="text-align: center;">✓</td><td></td><td></td><td></td><td style="text-align: center;">✓</td><td style="text-align: center;">✓</td><td></td></tr> <tr><td>CPMK-5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td style="text-align: center;">✓</td><td style="text-align: center;">✓</td><td></td><td></td><td style="text-align: center;">✓</td></tr> </tbody> </table> | | | | | | | | | | | | | | | | CPMK | Minggu Ke | | | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | CPMK-1 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | CPMK-2 | | | | ✓ | | | | | | | | | | | | | CPMK-3 | | | | | | | | | | | | | | | | | CPMK-4 | | | | | | | | ✓ | ✓ | ✓ | | | | ✓ | ✓ | | CPMK-5 | | | | | | | | | | | | ✓ | ✓ | | | ✓ |
| CPMK | Minggu Ke | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CPMK-1 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CPMK-2 | | | | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CPMK-3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CPMK-4 | | | | | | | | ✓ | ✓ | ✓ | | | | ✓ | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CPMK-5 | | | | | | | | | | | | ✓ | ✓ | | | ✓ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Deskripsi Singkat MK | Analisis mekanisme difusi, Hukum Fick's I dan II, Faktor-faktor yang mempengaruhi Difusi. Analisis Diagram Phase, Batas kelarutan, mikrostruktur, keseimbangan fasa, Interpretasi Diagram Phase. Analisis Transformasi Phase, Energi Kinetik pada transformasi phase, diagram transformasi Isothermal, dan diagram transformasi kontinu. Pembelajaran dilakukan dengan metode diskusi dan penelusuran jurnal yang terkait | | | | | | |
|-----------------------------|---|--|--|---|-----------------|--|---------------------|
| Pustaka | Utama : | | | | | | |
| | | <ol style="list-style-type: none"> 1. Callister, Jr.D William, 2009, " Materials Science And Engineering" , 8-th, John Willey & Sons, Inc 2. Diah Hari Kusumawati, Lydia Rohmawati, 2019, "Buku Ajar Termodinamika Bahan", JDS 3. Benjamin Crowell, 2009, " Simple Nature: An Introduction to Physics for Engineering and Physical Science Student", www.lightandmatter.com. 4. Jurnal nasional dan internasional yang relevan | | | | | |
| | Pendukung : | | | | | | |
| | | 1. Benjamin Crowell, 2009, "Simple Nature: An Introduction to Physics for Engineering and Physical Science Student",www.lightandmatter.com | | | | | |
| Dosen Pengampu | Dr. Diah Hari Kusumawati, S.Si., M.Si. Lydia Rohmawati, S.Si., M.Si. | | | | | | |
| Mg Ke- | Kemampuan akhir tiap tahapan belajar (Sub-CPMK) | Penilaian | | Bantuan Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, [Estimasi Waktu] | | Materi Pembelajaran [Pustaka] | Bobot Penilaian (%) |
| | | Indikator | Kriteria & Bentuk | Luring (offline) | Daring (online) | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 1 | Memahami konsep-konsep difusi serta mampu mengaplikasikan konsep tersebut dalam menyelesaikan soal dan masalah sesuai kejadian alam | 1. Menjelaskan konsep mekanisme difusi 2. Menjelaskan dan mendiskusikan difusi Steady state dan hukum Fick's I 3. Menjelaskan dan mendiskusikan difusi non-steady state dan hukum Fick's II 4. Mendiskusikan faktor-faktor yang mempengaruhi difusi | Kriteria: Kuantitatif Bentuk Penilaian : Aktifitas Partisipasif | Ceramah dan diskusi 6 X 50 | | Materi: Definisi Difusi dan Hukum Fick's 1 Pustaka: 1. Callister, Jr.D William, 2009, " Materials Science And Engineering" , 8-th, John Willey & Sons, Inc | 3% |
| 2 | Memahami konsep-konsep difusi serta mampu mengaplikasikan konsep tersebut dalam menyelesaikan soal dan masalah sesuai kejadian alam | 1. Menjelaskan konsep mekanisme difusi 2. Menjelaskan dan mendiskusikan difusi Steady state dan hukum Fick's I 3. Menjelaskan dan mendiskusikan difusi non-steady state dan hukum Fick's II 4. Mendiskusikan faktor-faktor yang mempengaruhi difusi | Kriteria: Kuantitatif Bentuk Penilaian : Aktifitas Partisipasif, Penilaian Hasil Project / Penilaian Produk | Ceramah dan diskusi 3 X 50 | 3x50 | Materi: Hukum Fick's 1 Pustaka: Diah Hari Kusumawati, Lydia Rohmawati, 2019, "Buku Ajar Termodinamika Bahan", JDS Materi: Definisi Difusi dan Hukum Fick's 1 Pustaka: 1. Callister, Jr.D William, 2009, " Materials Science And Engineering" , 8-th, John Willey & Sons, Inc | 5% |

| | | | | | | | |
|---|---|--|--|-------------------------------|------|--|----|
| 3 | Memahami konsep-konsep difusi serta mampu mengaplikasikan konsep tersebut dalam menyelesaikan soal dan masalah sesuai kejadian alam | <ol style="list-style-type: none"> 1. Menjelaskan konsep mekanisme difusi 2. Menjelaskan dan mendiskusikan difusi Steady state dan hukum Fick's I 3. Menjelaskan dan mendiskusikan difusi non-steady state dan hukum Fick's II 4. Mendiskusikan faktor-faktor yang mempengaruhi difusi | Kriteria: Kuantitatif Bentuk Penilaian : Aktifitas Partisipasif | Ceramah dan diskusi 6 X 50 | | Materi: Difusi dan Hukum Fick's Pustaka: 1. <i>Callister, Jr.D William, 2009, "Materials Science And Engineering", 8-th, John Willey & Sons, Inc</i> | 5% |
| 4 | Memahami Diagram Phase dan mampu menganalisis diagram phase dan sistem keseimbangan phase | <ol style="list-style-type: none"> 1. Mendiskusikan definisi dan model diagram phase secara umum 2. Menjelaskan konsep batas kelarutan dari bahan 3. Mendiskusikan mikrostruktur bahan apabila mengalami perlakuan thermal 4. Menganalisis keseimbangan phase | Kriteria: Kuantitatif Bentuk Penilaian : Aktifitas Partisipasif | Diskusi 3 X 50 | 3x50 | Materi: Definisi Diagram phase Pustaka: 1. <i>Callister, Jr.D William, 2009, "Materials Science And Engineering", 8-th, John Willey & Sons, Inc</i> | 3% |
| 5 | Memahami Diagram Phase dan mampu menganalisis diagram phase dan sistem keseimbangan phase | <ol style="list-style-type: none"> 1. Mendiskusikan definisi dan model diagram phase secara umum 2. Menjelaskan konsep batas kelarutan dari bahan 3. Mendiskusikan mikrostruktur bahan apabila mengalami perlakuan thermal 4. Menganalisis keseimbangan phase | Kriteria: Kuantitatif Bentuk Penilaian : Aktifitas Partisipasif, Penilaian Hasil Project / Penilaian Produk | Diskusi 6 X 50 | | Materi: Analisis Diagram Phase Pustaka: 1. <i>Callister, Jr.D William, 2009, "Materials Science And Engineering", 8-th, John Willey & Sons, Inc</i> | 3% |
| 6 | Memahami Diagram Phase dan mampu menganalisis diagram phase dan sistem keseimbangan phase | <ol style="list-style-type: none"> 1. Mendiskusikan definisi dan model diagram phase secara umum 2. Menjelaskan konsep batas kelarutan dari bahan 3. Mendiskusikan mikrostruktur bahan apabila mengalami perlakuan thermal 4. Menganalisis keseimbangan phase | Kriteria: Kuantitatif Bentuk Penilaian : Aktifitas Partisipasif, Penilaian Hasil Project / Penilaian Produk | Diskusi 6 X 50 | | Materi: Diagram phase Pustaka: 1. <i>Callister, Jr.D William, 2009, "Materials Science And Engineering", 8-th, John Willey & Sons, Inc</i> Materi: Analisis Diagram Phase Pustaka: <i>Diah Hari Kusumawati, Lydia Rohmawati, 2019, "Buku Ajar Termodinamika Bahan", JDS</i> | 5% |

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|----|---|---|--|-------------------|--|--|-----|
| 7 | Memahami Diagram Phase dan mampu menganalisis diagram phase dan sistem keseimbangan phase | <ol style="list-style-type: none"> 1. Mendiskusikan definisi dan model diagram phase secara umum 2. Menjelaskan konsep batas kelarutan dari bahan 3. Mendiskusikan mikrostruktur bahan apabila mengalami perlakuan thermal 4. Menganalisis keseimbangan phase | Kriteria: Kuantitatif Bentuk Penilaian : Aktifitas Partisipasif, Penilaian Hasil Project / Penilaian Produk | Diskusi 6 X 50 | | Materi: Diagram phase Pustaka: 1. Callister, Jr.D William, 2009, "Materials Science And Engineering", 8-th, John Willey & Sons, Inc <hr/> Materi: Analisis Diagram Phase Pustaka: Diah Hari Kusumawati, Lydia Rohmawati, 2019, "Buku Ajar Termodinamika Bahan", JDS | 6% |
| 8 | Memahami Diagram Phase dan mampu menganalisis diagram phase dan sistem keseimbangan phase | <ol style="list-style-type: none"> 1. Mendiskusikan definisi dan model diagram phase secara umum 2. Menjelaskan konsep batas kelarutan dari bahan 3. Mendiskusikan mikrostruktur bahan apabila mengalami perlakuan thermal 4. Menganalisis keseimbangan phase | Kriteria: Kuantitatif Bentuk Penilaian : Tes | Diskusi 6 X 50 | | Materi: Diagram phase Pustaka: 1. Callister, Jr.D William, 2009, "Materials Science And Engineering", 8-th, John Willey & Sons, Inc <hr/> Materi: Analisis Diagram Phase Pustaka: Diah Hari Kusumawati, Lydia Rohmawati, 2019, "Buku Ajar Termodinamika Bahan", JDS | 20% |
| 9 | Understand the difference between two- and three-dimensional phase diagrams and analyze phase transformations | Explaining phase diagrams in two dimensions and three dimensions | Kriteria: Tugas mandiri Bentuk Penilaian : Aktifitas Partisipasif | 3x50 | | Materi: Transformasi Phase 2 dimensi Pustaka: 1. Callister, Jr.D William, 2009, "Materials Science And Engineering", 8-th, John Willey & Sons, Inc | 3% |
| 10 | Understand the difference between two- and three-dimensional phase diagrams and analyze phase transformations | Explaining phase diagrams in two dimensions and three dimensions | Kriteria: Tugas mandiri Bentuk Penilaian : Aktifitas Partisipasif, Penilaian Hasil Project / Penilaian Produk | 3x50 | | Materi: Transformasi Phase 2 dimensi Pustaka: 1. Callister, Jr.D William, 2009, "Materials Science And Engineering", 8-th, John Willey & Sons, Inc | 3% |

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|----|--|---|---|------|--|--|----|
| 11 | Understand the difference between two- and three-dimensional phase diagrams and analyze phase transformations | Analyzing phase transformations on two-dimensional phase diagrams | Kriteria: Tugas mandiri Bentuk Penilaian : Aktifitas Partisipasif, Penilaian Hasil Project / Penilaian Produk | 3x50 | | Materi: Transformasi Phase 2 dimensi Pustaka: 1. <i>Callister, Jr.D William, 2009, " Materials Science And Engineering" , 8-th, John Willey & Sons, Inc</i> <hr/> Materi: Analisis Tranformasi Phase 2 dan 3 dimensi Pustaka: 1. <i>Callister, Jr.D William, 2009, " Materials Science And Engineering" , 8-th, John Willey & Sons, Inc</i> | 6% |
| 12 | Analyzing kinetic energy in the phase . transformation process | Explain the consequences of a phase transformation | Kriteria: Presentasi hasil produk materi tranformasi phase Bentuk Penilaian : Penilaian Hasil Project / Penilaian Produk | 3x50 | | Materi: Analisis Tranformasi Phase 2 dan 3 dimensi Pustaka: 1. <i>Callister, Jr.D William, 2009, " Materials Science And Engineering" , 8-th, John Willey & Sons, Inc</i> | 6% |
| 13 | Analyzing kinetic energy in the phase . transformation process | Explain the consequences of a phase transformation | Kriteria: Presentasi hasil produk materi tranformasi phase Bentuk Penilaian : Penilaian Hasil Project / Penilaian Produk | 3x50 | | Materi: Analisis Tranformasi Phase 2 dan 3 dimensi Pustaka: 1. <i>Callister, Jr.D William, 2009, " Materials Science And Engineering" , 8-th, John Willey & Sons, Inc</i> | 7% |
| 14 | Understand the concept of isothermal and continuous transformation and compare the two types of isothermal and continuous transformation | Explain the concept of isothermal and continuous transformation | Kriteria: Kuantitatif non tes Bentuk Penilaian : Penilaian Hasil Project / Penilaian Produk | 3x50 | | Materi: Konsep isothermal dan transformasi kontinyu Pustaka: 1. <i>Callister, Jr.D William, 2009, " Materials Science And Engineering" , 8-th, John Willey & Sons, Inc</i> | 5% |

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|----|---|---|--|------|--|---|-----|
| 15 | Understand the concept of isothermal and continuous transformation and compare the two types of isothermal and continuous transformation | Explain the concept of isothermal and continuous transformation | Kriteria: Progres pembuatan diagram phase Bentuk Penilaian : Penilaian Hasil Project / Penilaian Produk | 3x50 | | Materi: Konsep isothermal dan transformasi kontinyu Pustaka: 1. Callister, Jr.D William, 2009, "Materials Science And Engineering", 8-th, John Willey & Sons, Inc | 5% |
| 16 | 1.Understand the difference between two- and three-dimensional phase diagrams and analyze phase transformations 2.Analyzing kinetic energy in the phase . transformation process 3.Understand the concept of isothermal and continuous transformation and compare the two types of isothermal and continuous transformation | Kuantitatif non tes | Kriteria: Presentasi hasil produk berupa uji coba pembuatan diagram phase sederhana Bentuk Penilaian : Penilaian Hasil Project / Penilaian Produk | 3x50 | | Materi: Pembuatan diagram phase Pustaka: 1. Callister, Jr.D William, 2009, "Materials Science And Engineering", 8-th, John Willey & Sons, Inc | 15% |

Rekap Persentase Evaluasi : Project Based Learning

| No | Evaluasi | Persentase |
|----|--|------------|
| 1. | Aktifitas Partisipatif | 28% |
| 2. | Penilaian Hasil Project / Penilaian Produk | 52% |
| 3. | Tes | 20% |
| | | 100% |

Catatan

- Capaian Pembelajaran Lulusan Prodi (CPL - Prodi)** adalah kemampuan yang dimiliki oleh setiap lulusan prodi yang merupakan internalisasi dari sikap, penguasaan pengetahuan dan ketrampilan sesuai dengan jenjang studinya yang diperoleh melalui proses pembelajaran.
- CPL yang dibebankan pada mata kuliah** adalah beberapa capaian pembelajaran lulusan program studi (CPL-Prodi) yang digunakan untuk pembentukan/pengembangan sebuah mata kuliah yang terdiri dari aspek sikap, ketrampilan umum, ketrampilan khusus dan pengetahuan.
- CP Mata kuliah (CPMK)** adalah kemampuan yang dijabarkan secara spesifik dari CPL yang dibebankan pada mata kuliah, dan bersifat spesifik terhadap bahan kajian atau materi pembelajaran mata kuliah tersebut.
- Sub-CPMK Mata kuliah (Sub-CPMK)** adalah kemampuan yang dijabarkan secara spesifik dari CPMK yang dapat diukur atau diamati dan merupakan kemampuan akhir yang direncanakan pada tiap tahap pembelajaran, dan bersifat spesifik terhadap materi pembelajaran mata kuliah tersebut.
- Indikator penilaian** kemampuan dalam proses maupun hasil belajar mahasiswa adalah pernyataan spesifik dan terukur yang mengidentifikasi kemampuan atau kinerja hasil belajar mahasiswa yang disertai bukti-bukti.
- Kreteria Penilaian** adalah patokan yang digunakan sebagai ukuran atau tolok ukur ketercapaian pembelajaran dalam penilaian berdasarkan indikator-indikator yang telah ditetapkan. Kreteria penilaian merupakan pedoman bagi penilai agar penilaian konsisten dan tidak bias. Kreteria dapat berupa kuantitatif ataupun kualitatif.
- Bentuk penilaian:** tes dan non-tes.
- Bentuk pembelajaran:** Kuliah, Responsi, Tutorial, Seminar atau yang setara, Praktikum, Praktik Studio, Praktik Bengkel, Praktik Lapangan, Penelitian, Pengabdian Kepada Masyarakat dan/atau bentuk pembelajaran lain yang setara.
- Metode Pembelajaran:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, dan metode lainnya yg setara.
- Materi Pembelajaran** adalah rincian atau uraian dari bahan kajian yg dapat disajikan dalam bentuk beberapa pokok dan sub-pokok bahasan.
- Bobot penilaian** adalah prosentasi penilaian terhadap setiap pencapaian sub-CPMK yang besarnya proposional dengan tingkat kesulitan pencapaian sub-CPMK tsb., dan totalnya 100%.
- TM=Tatap Muka, PT=Penugasan terstruktur, BM=Belajar mandiri.

RPS ini telah divalidasi pada tanggal 29 Mei 2024

Koordinator Program Studi S1
Fisika



Prof. Dr. Munasir, S.Si., M.Si.
NIDN 0017116901

UPM Program Studi S1 Fisika



Dr. Diah Hari Kusumawati,
S.Si., M.Si.
NIDN 0018047302

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