

|  | <div> Universitas Negeri Surabaya<br/> Fakultas Matematika dan Ilmu Pengetahuan Alam<br/> Program Studi S2 Fisika </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                           |                                         |     |                         |          | <div>Kode Dokumen</div>   |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----|-------------------------|----------|---------------------------|------|-------|-------|-------|--------|----|----|------|-----------|---|--|--|--------|--|---|--|--------|--|--|---|--|--|--|--|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|--------|---|---|---|---|--|--|--|--|--|--|--|--|--|--|--|--|--------|--|--|--|--|---|---|--|---|---|---|--|--|--|--|--|--|--------|--|--|--|--|--|--|---|--|--|--|---|---|---|--|--|--|--------|--|--|--|--|--|--|--|--|--|--|--|--|--|---|---|---|
| <div>RENCANA PEMBELAJARAN SEMESTER</div>                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                           |                                         |     |                         |          |                           |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
| MATA KULIAH (MK)                                                                  | KODE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Rumpun MK                                                                                                                                                                                                                                                                                                                                 | BOBOT (sks)                             |     |                         | SEMESTER | Tgl Penyusunan            |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
| SISTEM KOMUNIKASI OPTIK                                                           | 4510203025                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Mata Kuliah Pilihan                                                                                                                                                                                                                                                                                                                       | T=2                                     | P=1 | ECTS=6.72               | 1        | 27 Juni 2025              |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
| OTORISASI                                                                         | Pengembang RPS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                           | Program Studi                           |     | Koordinator RMK         |          | Koordinator Program Studi |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
|                                                                                   | Dr. Rohim Aminullah Firdaus, S.Pd.,M.Si                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                           | Dr. Rohim Aminullah Firdaus, S.Pd.,M.Si |     | NUGRAHANI PRIMARY PUTRI |          |                           |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
| Model Pembelajaran                                                                | Case Study                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                           |                                         |     |                         |          |                           |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
| 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-6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Mampu menguasai pengetahuan teori fisika klasik dan modern lanjut, serta menguasai metode fisika untuk aplikasi iptek                                                                                                                                                                                                                     |                                         |     |                         |          |                           |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
|                                                                                   | CPL-8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Mengembangkan IPTEKS terkait gejala dan masalah fisis melalui analisis dan sintesis hasil riset                                                                                                                                                                                                                                           |                                         |     |                         |          |                           |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
|                                                                                   | Capaian Pembelajaran Mata Kuliah (CPMK)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                           |                                         |     |                         |          |                           |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
|                                                                                   | CPMK - 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Menganalisis prinsip dasar sistem komunikasi optik berdasarkan teori gelombang elektromagnetik dan optika modern.                                                                                                                                                                                                                         |                                         |     |                         |          |                           |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
|                                                                                   | CPMK - 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Mengembangkan pemikiran logis dan sistematis dalam memahami fenomena optik dan teknik komunikasi berbasis serat optik serta optoelektronik.                                                                                                                                                                                               |                                         |     |                         |          |                           |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
|                                                                                   | CPMK - 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Merancang dan mengevaluasi model matematis dan simulasi sistem komunikasi optik untuk memecahkan permasalahan transmisi sinyal dan deteksi cahaya.                                                                                                                                                                                        |                                         |     |                         |          |                           |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
|                                                                                   | CPMK - 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Mengintegrasikan pengetahuan fisika, keterampilan pemodelan, serta pemikiran kritis dalam menyusun solusi inovatif untuk peningkatan performa sistem komunikasi optik.                                                                                                                                                                    |                                         |     |                         |          |                           |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
|                                                                                   | Matrik CPL - CPMK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                           |                                         |     |                         |          |                           |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <table border="1"> <tr> <th>CPMK</th> <th>CPL-3</th> <th>CPL-6</th> <th>CPL-8</th> </tr> <tr> <td>CPMK-1</td> <td></td> <td></td> <td>✓</td> </tr> <tr> <td>CPMK-2</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>CPMK-3</td> <td></td> <td>✓</td> <td></td> </tr> <tr> <td>CPMK-4</td> <td></td> <td></td> <td>✓</td> </tr> </table> |                                         |     |                         |          |                           | CPMK | CPL-3 | CPL-6 | CPL-8 | CPMK-1 |    |    | ✓    | CPMK-2    | ✓ |  |  | CPMK-3 |  | ✓ |  | CPMK-4 |  |  | ✓ |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
| CPMK                                                                              | CPL-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | CPL-6                                                                                                                                                                                                                                                                                                                                     | CPL-8                                   |     |                         |          |                           |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
| CPMK-1                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                           | ✓                                       |     |                         |          |                           |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
| CPMK-2                                                                            | ✓                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                           |                                         |     |                         |          |                           |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
| CPMK-3                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ✓                                                                                                                                                                                                                                                                                                                                         |                                         |     |                         |          |                           |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
| CPMK-4                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                           | ✓                                       |     |                         |          |                           |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
| Matrik CPMK pada Kemampuan akhir tiap tahapan belajar (Sub-CPMK)                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                           |                                         |     |                         |          |                           |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
|                                                                                   | <table border="1"> <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> <tr> <td>CPMK-1</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-2</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-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></td><td></td><td></td><td></td><td></td><td></td><td>✓</td><td>✓</td><td>✓</td></tr> </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                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                           |                                         |     |                         |          |                           |      |       |       |       |        |    |    |      | 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                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                           |                                         |     |                         |          |                           |      |       |       |       |        |    | ✓  | ✓    | ✓         |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                           |                                         |     |                         |          |                           |      |       |       |       |        |    |    |      |           |   |  |  |        |  |   |  |        |  |  |   |  |  |  |  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |   |   |  |   |   |   |  |  |  |  |  |  |        |  |  |  |  |  |  |   |  |  |  |   |   |   |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |   |   |   |

|                      |                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                              |                                                                                  |                 |                                 |                     |
|----------------------|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------------------------------|-----------------|---------------------------------|---------------------|
| Deskripsi Singkat MK |                                                                      | Mata kuliah ini membahas prinsip-prinsip dasar elektromagnetik dan penerapannya dalam berbagai bidang teknologi dan sains terapan. Topik yang dikaji meliputi hukum-hukum dasar (Coulomb, Gauss, Ampere, Faraday, dan Maxwell), perilaku gelombang elektromagnetik dalam medium homogen dan non-homogen, transmisi gelombang melalui pemandu gelombang dan serat optik, serta interaksi gelombang elektromagnetik dengan material. Selain teori, mata kuliah ini juga menekankan pada penerapan praktis dalam sistem radar, antena, perangkat optoelektronik, dan sistem komunikasi nirkabel. Mahasiswa juga diperkenalkan pada metode numerik dan simulasi (misalnya metode elemen hingga/FEM atau metode beda hingga/FDTD) untuk menyelesaikan permasalahan elektromagnetik kompleks. Melalui praktikum atau proyek mini, mahasiswa diharapkan mampu merancang dan menganalisis sistem elektromagnetik secara aplikatif. |                                              |                                                                                  |                 |                                 |                     |
| Pustaka              |                                                                      | Utama :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                              |                                                                                  |                 |                                 |                     |
|                      |                                                                      | 1. heng, D. K. (1989). Field and wave electromagnetics (2nd ed.). Addison-Wesley.<br>2. Sadiku, M. N. O. (2023). Elements of electromagnetics (7th ed.). Oxford University Press.<br>3. Ulaby, F. T., Inan, U. S., & Aliv, M. G. (2020). Fundamentals of applied electromagnetics (8th ed.). Pearson.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                              |                                                                                  |                 |                                 |                     |
|                      |                                                                      | Pendukung :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                              |                                                                                  |                 |                                 |                     |
|                      |                                                                      | 1. Jackson, J. D. (1998). Classical electrodynamics (3rd ed.). Wiley.<br>2. Ramo, S., Whinnery, J. R., & Van Duzer, T. (1994). Fields and waves in communication electronics (3rd ed.). Wiley.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                              |                                                                                  |                 |                                 |                     |
| Dosen Pengampu       |                                                                      | Dr. Rohim Aminullah Firdaus, S.Pd, M.Si                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                              |                                                                                  |                 |                                 |                     |
| Mg Ke-               | Kemampuan akhir tiap tahapan belajar (Sub-CPMK)                      | Penilaian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                              | Bantuk Pembelajaran, Metode Pembelajaran, Penugasan Mahasiswa, [ Estimasi Waktu] |                 | Materi Pembelajaran [ Pustaka ] | Bobot Penilaian (%) |
|                      |                                                                      | Indikator                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Kriteria & Bentuk                            | Luring (offline)                                                                 | Daring (online) |                                 |                     |
| (1)                  | (2)                                                                  | (3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | (4)                                          | (5)                                                                              | (6)             | (7)                             | (8)                 |
| 1                    | Menjelaskan definisi, sejarah, dan aplikasi sistem komunikasi        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Bentuk Penilaian :<br>Aktifitas Partisipasif |                                                                                  |                 |                                 | 3%                  |
| 2                    | Mengulas ulang teori gelombang dan relasinya dengan cahaya           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Bentuk Penilaian :<br>Aktifitas Partisipasif |                                                                                  |                 |                                 | 3%                  |
| 3                    | Menjelaskan indeks bias, mode, dan parameter gelombang               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Bentuk Penilaian :<br>Aktifitas Partisipasif |                                                                                  |                 |                                 | 4%                  |
| 4                    | Membandingkan step-index dan graded-index fibers                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Bentuk Penilaian :<br>Aktifitas Partisipasif |                                                                                  |                 |                                 | 4%                  |
| 5                    | Menganalisis faktor redaman, dispersi, dan batas-batasnya            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Bentuk Penilaian :<br>Aktifitas Partisipasif |                                                                                  |                 |                                 | 3%                  |
| 6                    | Menjelaskan efek nonlinearitas dalam media optik                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Bentuk Penilaian :<br>Aktifitas Partisipasif |                                                                                  |                 |                                 | 4%                  |
| 7                    | Menganalisis sinyal optik dan bandwidth dalam domain waktu/frekuensi |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Bentuk Penilaian :<br>Aktifitas Partisipasif |                                                                                  |                 |                                 | 4%                  |
| 8                    |                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Bentuk Penilaian :<br>Tes                    |                                                                                  |                 |                                 | 20%                 |

|    |                                                                 |  |                                                           |  |  |  |     |
|----|-----------------------------------------------------------------|--|-----------------------------------------------------------|--|--|--|-----|
| 9  | Mendesripsikan karakteristik laser dan LED untuk komunikasi     |  | <b>Bentuk Penilaian</b><br>:<br>Aktifitas<br>Partisipasif |  |  |  | 4%  |
| 10 | Menganalisis respons detektor seperti fotodioda dan APD         |  | <b>Bentuk Penilaian</b><br>:<br>Aktifitas<br>Partisipasif |  |  |  | 4%  |
| 11 | Menyusun model matematis sistem optik                           |  | <b>Bentuk Penilaian</b><br>:<br>Aktifitas<br>Partisipasif |  |  |  | 4%  |
| 12 | Merancang konfigurasi WDM dan TDM berbasis model                |  | <b>Bentuk Penilaian</b><br>:<br>Aktifitas<br>Partisipasif |  |  |  | 3%  |
| 13 | Menggunakan software (OptiSystem / MATLAB / Python)             |  | <b>Bentuk Penilaian</b><br>:<br>Aktifitas<br>Partisipasif |  |  |  | 4%  |
| 14 | Menganalisis tren dan teknologi mutakhir dalam komunikasi optik |  | <b>Bentuk Penilaian</b><br>:<br>Aktifitas<br>Partisipasif |  |  |  | 3%  |
| 15 | Menyajikan rancangan sistem dan hasil simulasi                  |  | <b>Bentuk Penilaian</b><br>:<br>Aktifitas<br>Partisipasif |  |  |  | 3%  |
| 16 | Evaluasi akhir capaian pembelajaran                             |  | <b>Bentuk Penilaian</b><br>:<br>Tes                       |  |  |  | 30% |

#### Rekap Persentase Evaluasi : Case Study

| No | Evaluasi               | Persentase |
|----|------------------------|------------|
| 1. | Aktifitas Partisipasif | 50%        |
| 2. | Tes                    | 50%        |
|    |                        | 100%       |

#### Catatan

- 1. 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 prodinya yang diperoleh melalui proses pembelajaran.
- 2. 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.
- 3. 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.
- 4. 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.
- 5. 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.
- 6. 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.
- 7. Bentuk penilaian:** tes dan non-tes.
- 8. 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.

9. **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.
10. **Materi Pembelajaran** adalah rincian atau uraian dari bahan kajian yg dapat disajikan dalam bentuk beberapa pokok dan sub-pokok bahasan.
11. **Bobot penilaian** adalah prosentasi penilaian terhadap setiap pencapaian sub-CPMK yang besarnya proposional dengan tingkat kesulitan pencapaian sub-CPMK tsb., dan totalnya 100%.
12. TM=Tatap Muka, PT=Penugasan terstruktur, BM=Belajar mandiri.