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|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----|-----------|--------------------------------------------|----------------|-----------|-------|--------|--------|----|----|--------|----|----|--------|---|--|--------|--|---|--------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|--------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  | Universitas Negeri Surabaya<br>Fakultas Vokasi<br>Program Studi D4 Manajemen Informatika                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                |                      |     |           |                                            | Kode Dokumen   |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| RENCANA PEMBELAJARAN SEMESTER                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MATA KULIAH (MK)                                                                  | KODE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Rumpun MK                                                                                                                                                                                                                                                                                                                      | BOBOT (sks)          |     |           | SEMESTER                                   | Tgl Penyusunan |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Praktikum Grafika Komputer                                                        | 5730101179                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Grafika, Interaksi dan Game                                                                                                                                                                                                                                                                                                    | T=0                  | P=1 | ECTS=1.59 | 4                                          | 8 Juli 2025    |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| OTORISASI                                                                         | Pengembang RPS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                | Koordinator RMK      |     |           | Koordinator Program Studi                  |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                   | Dodik Arwin Dermawana                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                | Dodik Arwin Dermawan |     |           | Dodik Arwin Dermawan,<br>S.ST., S.T., M.T. |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Model Pembelajaran                                                                | Project Based Learning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Capaian Pembelajaran (CP)                                                         | CPL-PRODI yang dibebankan pada MK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                   | CPL-8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Mampu menerapkan pemikiran logis, kritis dan inovatif dalam melakukan pekerjaan dalam bidang teknologi informasi dengan menunjukkan kinerja yang bermutu dan terukur serta memanfaatkannya untuk menganalisa, mendokumentasikan dan menyusun deskripsi saintifik hasil kajian dalam bentuk laporan yang terjamin kesahihannya. |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                   | CPL-13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Menguasai konsep matematika terapan, pengetahuan dasar TIK (Algoritma, Pemrograman, Basis Data), sains dan prinsip rekayasa yang diperlukan untuk analisis dan perancangan sistem, proses, produk atau komponen pada rekayasa perangkat lunak                                                                                  |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                   | Capaian Pembelajaran Mata Kuliah (CPMK)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                   | CPMK - 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Mahasiswa mampu menjelaskan dasar-dasar sistem grafika dan graphics pipeline.                                                                                                                                                                                                                                                  |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                   | CPMK - 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Mahasiswa mampu membuat dan mendemonstrasikan program grafik sederhana.                                                                                                                                                                                                                                                        |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                   | CPMK - 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Mahasiswa mampu membuat aplikasi grafik interaktif.                                                                                                                                                                                                                                                                            |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                   | CPMK - 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Mahasiswa mampu mengimplementasikan transformasi objek dan rendering untuk visual realism.                                                                                                                                                                                                                                     |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                   | CPMK - 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Mahasiswa mampu mengembangkan model grafik 3D menggunakan tools grafika modern.                                                                                                                                                                                                                                                |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                   | Matrik CPL - CPMK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <table><tr><td>CPMK</td><td>CPL-8</td><td>CPL-13</td></tr><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>✓</td></tr><tr><td>CPMK-5</td><td></td><td>✓</td></tr></table>                                    |                      |     |           |                                            |                | CPMK      | CPL-8 | CPL-13 | CPMK-1 | ✓  | ✓  | CPMK-2 | ✓  | ✓  | CPMK-3 | ✓ |  | CPMK-4 |  | ✓ | CPMK-5 |   | ✓ |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                   | CPMK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | CPL-8                                                                                                                                                                                                                                                                                                                          | CPL-13               |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                   | CPMK-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ✓                                                                                                                                                                                                                                                                                                                              | ✓                    |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CPMK-2                                                                            | ✓                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ✓                                                                                                                                                                                                                                                                                                                              |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CPMK-3                                                                            | ✓                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CPMK-4                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ✓                                                                                                                                                                                                                                                                                                                              |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CPMK-5                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ✓                                                                                                                                                                                                                                                                                                                              |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Matrik CPMK pada Kemampuan akhir tiap tahapan belajar (Sub-CPMK)                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                   | <table><tr><td rowspan="2">CPMK</td><td colspan="16">Minggu Ke</td></tr><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td></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><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></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-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                                                              | Matakuliah ini mengaji tentang prinsip dan metode dasar dalam grafika komputer serta mampu untuk melakukan perancangan, mengimplementasikan dan menganalisis sistem aplikasi grafika yang benar dan baik. Adapun materi yang dipelajari dalam matakuliah ini adalah pengenalan komputer grafik, primitive drawing , obyek grafik 2D, transformasi affine 2D, obyek grafik 3D, transformasi 3D affine, membuat obyek-obyek grafik 3D kompleks. Seiring dengan kebutuhan industri, mata kuliah Grafika Komputer juga mempeleajari implementasi Virtual Reality yang saat ini lebih banyak dibutuhkan untuk simulasi dan pengembangan virtual laboratorium.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Pustaka                                                                           | Utama :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                |                      |     |           |                                            |                |           |       |        |        |    |    |        |    |    |        |   |  |        |  |   |        |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

|                       |                                                                                                     | <ol style="list-style-type: none"> <li>1. Edward Angel. 2009. Interactive Computer Graphics: A Top-Down Approach Using OpenGL , Fifth Edition. Pearson International Inc.</li> <li>2. Edward Angel. 2002. OpenGLTM: A Primer, Third Edition. Addison-Wesley.</li> <li>3. Hills, Francis S Jr. 2000. Computer Graphics Using OpenGL, Second Edition . New Jersey: Prentice Hall.</li> <li>4. Donald Hearn and M. Pauline Baker. Computer Graphics with OpenGL , 3rd Edition.</li> <li>5. Alan Watt. 3D Computer Graphics. Addison-Wesley.</li> </ol> |                                                                                                |                                                                                                                   |                 |                                                                                                                        |                     |
|-----------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------|---------------------|
|                       |                                                                                                     | <b>Pendukung :</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                |                                                                                                                   |                 |                                                                                                                        |                     |
|                       |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                |                                                                                                                   |                 |                                                                                                                        |                     |
| <b>Dosen Pengampu</b> |                                                                                                     | Ari Kurniawan, S.Kom., M.T.<br>Dodik Arwin Dermawan, S.ST., S.T., M.T.<br>I Gde Agung Sri Sidhimantra, S.Kom., M.Kom.                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                |                                                                                                                   |                 |                                                                                                                        |                     |
| 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                     | Mahasiswa mampu menjelaskan dasar-dasar sistem grafika dan graphics pipeline dalam graphics library | <ol style="list-style-type: none"> <li>1. Menjelaskan Sistem Grafika</li> <li>2. Menjelaskan pengertian Grafika Komputer</li> <li>3. Mengidentifikasi pembentukan Grafik/Gambar</li> <li>4. Mengidentifikasi model dan Arsitektur Sistem Grafika</li> <li>5. Mengidentifikasi aplikasi Grafika Komputer</li> <li>6. Menjelaskan dasar-dasar Graphics Library</li> <li>7. Menjelaskan latar Belakang Graphics Library</li> <li>8. Mengidentifikasi contoh Program Graphics Library</li> <li>9. Mengidentifikasi 3D dalam Sistem Grafika</li> </ol>   | <b>Kriteria:</b><br>Rubrik Holistik<br><br><b>Bentuk Penilaian :</b><br>Aktifitas Partisipatif | Pendekatan: Saintifik<br>Model: Pembelajaran berbasis masalah<br>Metode: Diskusi, Presentasi, Praktikum<br>2 X 50 |                 | <b>Materi:</b> a<br><b>Pustaka:</b><br>Edward Angel. 2002. OpenGLTM: A Primer, Third Edition. Addison-Wesley.          | 5%                  |
| 2                     | Mahasiswa mampu membuat dan mendemonstrasikan program grafik sederhana                              | <ol style="list-style-type: none"> <li>1. Menjelaskan Sierpinski Gasket (2D/3D)</li> <li>2. Mengidentifikasi Input dan Interaksi</li> <li>3. Menjelaskan Graphics Library Callbacks</li> <li>4. Menerapkan Graphic Library pada kode program</li> </ol>                                                                                                                                                                                                                                                                                             | <b>Kriteria:</b><br>Rubrik Holistik<br><br><b>Bentuk Penilaian :</b><br>Penilaian Praktikum    | Pendekatan: Saintifik<br>Model: Pembelajaran berbasis masalah<br>Metode: Diskusi, Presentasi, Praktikum<br>2 X 50 |                 | <b>Materi:</b> a<br><b>Pustaka:</b><br>Edward Angel. 2002. OpenGLTM: A Primer, Third Edition. Addison-Wesley.          | 5%                  |
| 3                     | Mahasiswa mampu membuat aplikasi grafik interaktif                                                  | <ol style="list-style-type: none"> <li>1. Mengidentifikasi perangkat input, display, menu, dan picking</li> <li>2. Menerapkan cara merancang dan membangun program interaktif dengan Graphic Library</li> </ol>                                                                                                                                                                                                                                                                                                                                     | <b>Kriteria:</b><br>Rubrik Holistik<br><br><b>Bentuk Penilaian :</b><br>Penilaian Praktikum    | Pendekatan: Saintifik<br>Model: Pembelajaran berbasis masalah<br>Metode: Diskusi, Presentasi, Praktikum<br>2 X 50 |                 | <b>Materi:</b> a<br><b>Pustaka:</b><br>Edward Angel. 2002. OpenGLTM: A Primer, Third Edition. Addison-Wesley.          | 5%                  |
| 4                     | Mahasiswa mampu mengimplementasikan World Windows dan Viewport                                      | <ol style="list-style-type: none"> <li>1. Mengidentifikasi dan menerapkan World Windows dan Viewport</li> <li>2. Mengidentifikasi dan menerapkan clipping lines</li> <li>3. Mengidentifikasi dan menerapkan regular polygon, circles dan arcs</li> </ol>                                                                                                                                                                                                                                                                                            | <b>Kriteria:</b><br>Rubrik Holistik<br><br><b>Bentuk Penilaian :</b><br>Penilaian Praktikum    | Pendekatan: Saintifik<br>Model: Pembelajaran berbasis masalah<br>Metode: Diskusi, Presentasi, Praktikum<br>2 X 50 |                 | <b>Materi:</b> a<br><b>Pustaka:</b><br>Donald Hearn and M. Pauline Baker. Computer Graphics with OpenGL , 3rd Edition. | 5%                  |

|    |                                                                                      |                                                                                                                                                                                                                     |                                                                                                                      |                                                                                                                   |  |                                                                                                                                                      |     |
|----|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 5  | Mahasiswa dapat mengimplementasikan vector tools                                     | 1.Menjelaskan vectors<br>2.Menjelaskan dot product<br>3.Menjelaskan cross product of two vectors<br>4.Menjelaskan representasi key geometric object<br>5.Menerapkan vector pada program Graphic Library             | <b>Kriteria:</b><br>Rubrik Holistik<br><br><b>Bentuk Penilaian :</b><br>Penilaian Praktikum                          | Pendekatan: Saintifik<br>Model: Pembelajaran berbasis masalah<br>Metode: Diskusi, Presentasi, Praktikum<br>2 X 50 |  | <b>Materi: a</b><br><b>Pustaka:</b><br><i>Hills, Francis S Jr. 2000. Computer Graphics Using OpenGL, Second Edition . New Jersey: Prentice Hall.</i> | 5%  |
| 6  | Mahasiswa dapat menjelaskan geometri, representasi, dan transformasi objek           | Menjelaskan geometri, representasi, dan transformasi objek                                                                                                                                                          | <b>Kriteria:</b><br>Rubrik Holistik<br><br><b>Bentuk Penilaian :</b><br>Penilaian Praktikum                          | Pendekatan: Saintifik<br>Model: Pembelajaran berbasis masalah<br>Metode: Diskusi, Presentasi, Praktikum<br>2 X 50 |  | <b>Materi: a</b><br><b>Pustaka:</b><br><i>Hills, Francis S Jr. 2000. Computer Graphics Using OpenGL, Second Edition . New Jersey: Prentice Hall.</i> | 5%  |
| 7  | Mahasiswa dapat mendemonstrasikan transformasi objek dalam program grafik interaktif | 1.Mengidentifikasi dan menerapkan transformasi pada Graphics Library<br>2.Menerapkan pembangunan model pada program Graphic Library<br>3.Menerapkan isometric cube pada program Graphic Library                     | <b>Kriteria:</b><br>1.Rubrik Holistik 2.5<br><br><b>Bentuk Penilaian :</b><br>Penilaian Praktikum                    | Pendekatan: Saintifik<br>Model: Pembelajaran berbasis masalah<br>Metode: Diskusi, Presentasi, Praktikum<br>2 X 50 |  | <b>Materi: a</b><br><b>Pustaka:</b><br><i>Donald Hearn and M. Pauline Baker. Computer Graphics with OpenGL , 3rd Edition.</i>                        | 5%  |
| 8  | Ujian SubSumatif / Ujian Tengah Semester                                             | Ujian SubSumatif / Ujian Tengah Semester                                                                                                                                                                            | <b>Kriteria:</b><br>Ujian SubSumatif / Ujian Tengah Semester<br><br><b>Bentuk Penilaian :</b><br>Penilaian Praktikum | Ujian SubSumatif / Ujian Tengah Semester<br>3 X 50                                                                |  | <b>Materi: a</b><br><b>Pustaka:</b><br><i>Donald Hearn and M. Pauline Baker. Computer Graphics with OpenGL , 3rd Edition.</i>                        | 15% |
| 9  | Mahasiswa dapat memodelkan bentuk dengan Polygonal Meshes                            | 1.Mengidentifikasi Polyhedra<br>2.Mengidentifikasi Extruded Shapes<br>3.Mengidentifikasi Particle System<br>4.Menerapkan pemodelan Polygonal Meshes pada program Graphic Library                                    | <b>Kriteria:</b><br>Rubrik Holistik<br><br><b>Bentuk Penilaian :</b><br>Penilaian Praktikum                          | Pendekatan: Saintifik<br>Model: Pembelajaran berbasis masalah<br>Metode: Diskusi, Presentasi, Praktikum<br>2 X 50 |  | <b>Materi: a</b><br><b>Pustaka:</b><br><i>Donald Hearn and M. Pauline Baker. Computer Graphics with OpenGL , 3rd Edition.</i>                        | 5%  |
| 10 | Mahasiswa dapat mengimplementasikan 3D viewing                                       | 1.Mengidentifikasi dan menerapkan camera<br>2.Mengidentifikasi dan menerapkan proyeksi perspektif objek 3D<br>3.Mengidentifikasi dan menerapkan stereo view<br>4.Mengidentifikasi dan menerapkan taksonomi proyeksi | <b>Kriteria:</b><br>Rubrik Holistik<br><br><b>Bentuk Penilaian :</b><br>Penilaian Praktikum                          | Pendekatan: Saintifik<br>Model: Pembelajaran berbasis masalah<br>Metode: Diskusi, Presentasi, Praktikum<br>2 X 50 |  | <b>Materi: s</b><br><b>Pustaka:</b><br><i>Donald Hearn and M. Pauline Baker. Computer Graphics with OpenGL , 3rd Edition.</i>                        | 5%  |

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|----|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------|----|
| 11 | Mahasiswa mampu melakukan Rendering faces pada visual realism | 1.Mengidentifikasi dan menerapkan shading models<br>2.Mengidentifikasi dan menerapkan flat shading dan smooth shading<br>3.Mengidentifikasi dan menerapkan Adding hidden surface removal<br>4.Mengidentifikasi dan menerapkan texture to faces<br>5.Mengidentifikasi dan menerapkan shadows of object                                                                             | <b>Kriteria:</b><br>Rubrik Holistik<br><br><b>Bentuk Penilaian :</b><br>Penilaian Praktikum | Pendekatan:<br>SaintifikModel:<br>Pembelajaran berbasis masalahMetode:<br>Diskusi, Presentasi, Praktikum<br>2 X 50 |  | <b>Materi: a</b><br><b>Pustaka:</b><br><i>Donald Hearn and M. Pauline Baker. Computer Graphics with OpenGL , 3rd Edition.</i> | 5% |
| 12 | Mahasiswa mampu melakukan rendering faces pada visual realism | 1.Mengidentifikasi dan menerapkan shading models<br>2.Mengidentifikasi dan menerapkan flat shading dan smooth shading<br>3.Mengidentifikasi dan menerapkan Adding hidden surface removal<br>4.Mengidentifikasi dan menerapkan texture to faces<br>5.Mengidentifikasi dan menerapkan shadows of object                                                                             | <b>Kriteria:</b><br>Rubrik Holistik<br><br><b>Bentuk Penilaian :</b><br>Penilaian Praktikum | Pendekatan:<br>SaintifikModel:<br>Pembelajaran berbasis masalahMetode:<br>Diskusi, Presentasi, Praktikum<br>2 X 50 |  | <b>Materi: a</b><br><b>Pustaka:</b><br><i>Donald Hearn and M. Pauline Baker. Computer Graphics with OpenGL , 3rd Edition.</i> | 5% |
| 13 | Mahasiswa dapat memakai tools untuk display raster            | 1.Mengidentifikasi dan menerapkan proses manipulasi pixmaps<br>2.Mengidentifikasi dan menerapkan kombinasi pixmaps<br>3.Mengidentifikasi dan menerapkan algoritma Bresenham<br>4.Mengidentifikasi dan menerapkan define and fill region of pixels<br>5.Mengidentifikasi dan menerapkan filling polygon<br>6.Mengidentifikasi dan menerapkan aliasing and anti-aliasing techniques | <b>Kriteria:</b><br>Rubrik Holistik<br><br><b>Bentuk Penilaian :</b><br>Penilaian Praktikum | Pendekatan:<br>SaintifikModel:<br>Pembelajaran berbasis masalahMetode:<br>Diskusi, Presentasi, Praktikum<br>2 X 50 |  | <b>Materi: a</b><br><b>Pustaka:</b><br><i>Edward Angel. 2002. OpenGLTM: A Primer, Third Edition. Addison-Wesley.</i>          | 5% |
| 14 | Mahasiswa dapat memakai tools untuk display raster            | 1.Mengidentifikasi dan menerapkan proses manipulasi pixmaps<br>2.Mengidentifikasi dan menerapkan kombinasi pixmaps<br>3.Mengidentifikasi dan menerapkan algoritma Bresenham<br>4.Mengidentifikasi dan menerapkan define and fill region of pixels<br>5.Mengidentifikasi dan menerapkan filling polygon<br>6.Mengidentifikasi dan menerapkan aliasing and anti-aliasing techniques | <b>Kriteria:</b><br>Rubrik Holistik<br><br><b>Bentuk Penilaian :</b><br>Penilaian Praktikum | Pendekatan:<br>SaintifikModel:<br>Pembelajaran berbasis masalahMetode:<br>Diskusi, Presentasi, Praktikum<br>2 X 50 |  | <b>Materi: a</b><br><b>Pustaka:</b><br><i>Alan Watt. 3D Computer Graphics. Addison-Wesley.</i>                                | 5% |

|    |                                                              |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                |                                                                                                                   |  |                                                                                                                                                                               |     |
|----|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 15 | Mahasiswa dapat mengimplementasikan curve dan desain surface | 1. Mengidentifikasi dan menerapkan interactive curve design<br>2. Mengidentifikasi dan menerapkan Bezier curve for curve design<br>3. Mengidentifikasi dan menerapkan properties of Bezier curve<br>4. Mengidentifikasi dan menerapkan finding better blending function<br>5. Mengidentifikasi dan menerapkan B-spline basis function<br>6. Mengidentifikasi dan menerapkan rationalsplines and NURPS curves | <b>Kriteria:</b><br>Rubrik Holistik<br><br><b>Bentuk Penilaian :</b><br>Penilaian Praktikum                                                                    | Pendekatan: Saintifik<br>Model: Pembelajaran berbasis masalah<br>Metode: Diskusi, Presentasi, Praktikum<br>2 X 50 |  | <b>Materi: a</b><br><b>Pustaka:</b><br><i>Donald Hearn and M. Pauline Baker. Computer Graphics with OpenGL , 3rd Edition.</i>                                                 | 5%  |
| 16 | Ujian Sumatif / Ujian Akhir Semester                         | Ujian Sumatif / Ujian Akhir Semester                                                                                                                                                                                                                                                                                                                                                                         | <b>Kriteria:</b><br>Ujian Sumatif / Ujian Akhir Semester<br><br><b>Bentuk Penilaian :</b><br>Penilaian Hasil Project / Penilaian Produk, Praktik / Unjuk Kerja | Ujian Sumatif / Ujian Akhir Semester<br>2 X 50                                                                    |  | <b>Materi: a</b><br><b>Pustaka:</b><br><i>Edward Angel. 2009. Interactive Computer Graphics: A Top-Down Approach Using OpenGL , Fifth Edition. Pearson International Inc.</i> | 15% |

#### Rekap Persentase Evaluasi : Project Based Learning

| No | Evaluasi                                   | Persentase |
|----|--------------------------------------------|------------|
| 1. | Aktifitas Partisipasi                      | 5%         |
| 2. | Penilaian Hasil Project / Penilaian Produk | 7.5%       |
| 3. | Penilaian Praktikum                        | 80%        |
| 4. | Praktik / Unjuk Kerja                      | 7.5%       |
|    |                                            | 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 prodinya 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.

Koordinator Program Studi D4  
Manajemen Informatika



Dodik Arwin Dermawan, S.ST.,  
S.T., M.T.  
NIDN 0008017807

**UPM** Program Studi D4  
Manajemen Informatika



Hafizhuddin Zul Fahmi, S.Kom.,  
M.Sc.  
NIDN 0011059502

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