



INSTITUT TEKNOLOGI SEPULUH NOPEMBER (ITS)
FAKULTAS TEKNOLOGI ELEKTRO DAN INFORMATIKA CERDAS
DEPARTEMEN TEKNIK ELEKTRO
Program Studi Magister (S2) Teknik Elektro

**Kode
Dokumen**

RENCANA PEMBELAJARAN SEMESTER

| MATA KULIAH (MK) | KODE | Rumpun MK | BOBOT (sks) | | SEMESTER | Tgl Penyusunan |
|--|--|--|------------------------|-------|-------------------------------------|----------------|
| Ruang Keadaan Sistem Kontrol Linier <i>State Space Linear Control System</i> | EE235121 | | T = 3 | P = 0 | 1 (wajib bidang) | 25 Nov 2022 |
| OTORISASI / PENGESAHAN | Dosen Pengembang RPS | | Koordinator RMK | | Ka PRODI | |
| | Ari Santoso | | Ari Santoso | | Ronny Mardiyanto, S.T., M.T., Ph.D. | |
| Capaian Pembelajaran | CPL-PRODI yang dibebankan pada MK | | | | | |
| | CPL-5 | Mampu mendesain komponen, sistem, dan proses yang logis dan realistis sesuai dengan spesifikasi yang ditentukan dengan mempertimbangkan aspek keselamatan, sosial, budaya, lingkungan, dan ekonomi | | | | |
| | CPL-6 | Mampu mengidentifikasi, memformulasikan dan menyelesaikan permasalahan di bidang teknik elektro | | | | |
| | CPL-7 | Mampu mengetahui dan mengaplikasi metode, keahlian sesuai perkembangan terkini di bidang ilmu pengetahuan dan teknologi untuk menyelesaikan permasalahan teknik elektro dengan mengedepankan nilai-nilai universal | | | | |
| | Capaian Pembelajaran Mata Kuliah (CPMK) | | | | | |
| | CPMK-1 | Menguasai konsep dan prinsip persepsi dan navigasi untuk kendaraan otonom. Mastering the concepts and principles of perception and navigation of autonomous vehicle | | | | |
| | CPMK-3 | Mampu menganalisis dan merancang persepsi dan navigasi untuk kendaraan otonom Able to analyze and design perception and navigation of autonomous vehicle | | | | |
| | CPMK-4 | Menunjukkan sikap bertanggungjawab atas pekerjaan di bidang keahliannya secara mandiri Show a responsible attitude towards the work in the field of expertise independently | | | | |

| Peta CPL - CP MK | <table border="1"> <thead> <tr> <th>CPMK</th> <th>CPL-1</th> <th>CPL-2</th> <th>CPL-3</th> <th>CPL-4</th> <th>CPL-5</th> <th>CPL-6</th> <th>CPL-7</th> <th>CPL-8</th> <th>CPL-9</th> </tr> </thead> <tbody> <tr> <td>CPMK-1</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> </tr> <tr> <td>CPMK-4</td> <td></td> <td></td> <td></td> <td></td> <td>√</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> | CPMK | CPL-1 | CPL-2 | CPL-3 | CPL-4 | CPL-5 | CPL-6 | CPL-7 | CPL-8 | CPL-9 | CPMK-1 | | | | | | √ | | | | CPMK-3 | | | | | √ | | √ | | | CPMK-4 | | | | | √ | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--|--|--|--|--|---|--|--|--|--------|--|--|--|--|---|--|---|--|--|--------|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| CPMK | CPL-1 | CPL-2 | CPL-3 | CPL-4 | CPL-5 | CPL-6 | CPL-7 | CPL-8 | CPL-9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CPMK-1 | | | | | | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CPMK-3 | | | | | √ | | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CPMK-4 | | | | | √ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Diskripsi Singkat MK | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bahan Kajian: Materi pembelajaran | <ol style="list-style-type: none"> 1. Introduction to control feedback systems 2. linear vector space 3. Linear state-space representations 4. Transfer functions and state matrices 5. Stability (internal, BIBO, Lyapunov) 6. Properties of controllability and observability and their application 7. Pole placement by state feedback controller 8. State-feedback-based controller and state observers 9. LQR (optimal control for linear systems with quadratic cost) 10. Design of discrete time control systems | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pustaka | Utama: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <p>[1] C.T. Chen, Linear System Theory and Design, Oxford University Press, 4th Ed</p> <p>[2] Linear State-Space Control Systems by Robert L. Williams, II and Douglas A. Lawrence</p> <p>[3] Modern Control Engineering by Katsuhiko Ogata</p> <p>[4] Discrete-Time Control systems, by Katsuhiko Ogata, 2nd Edition, Pearson Education/PHI, 1995</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Pendukung: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

[1] Digital Control Systems, 2nd Edition, by Benjamin C. Kuo, Oxford University Press, 2003

| Media Pembelajaran | | Perangkat lunak : | | Perangkat keras : | | | |
|---------------------------|---|--------------------------|-------------------|--|------------------|-------------------------------|---------------------|
| Team Teaching | | Prof. Achmad Jazidie | | | | | |
| Matakuliah syarat | | | | | | | |
| Mg Ke- | Kemampuan akhir tiap tahapan belajar (CPMK) | Penilaian | | Bantuk Pembelajaran; Metode Pembelajaran; Penugasan Mahasiswa; [Estimasi Waktu] | | Materi Pembelajaran [Pustaka] | Bobot Penilaian (%) |
| | | Indikator | Kriteria & Bentuk | Daring (online) | Luring (offline) | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| | | | Tugas | Pembelajaran dalam kelas (1x2x50 menit) Belajar mandiri (1x2x60 menit) Belajar terstruktur (1x2x60 menit) | | | 5% |
| | | | Tugas | Pembelajaran dalam kelas (2x2x50 menit) Belajar mandiri (2x2x60 menit) Belajar terstruktur (2x2x60 menit) | | | 5% |

| | | | | | | |
|--|--|--|------------|--|--|----|
| | | | Tugas Quiz | Pembelajaran dalam kelas (2x2x50 menit) Belajar mandiri (2x2x60 menit) Belajar terstruktur (2x2x60 menit) | | 5% |
| | | | Tugas | Pembelajaran dalam kelas (1x2x50 menit) Belajar mandiri (1x2x60 menit) Belajar terstruktur (1x2x60 menit) | | 5% |
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| | | | Tugas | Pembelajaran dalam kelas (2x2x50 menit) Belajar mandiri (2x2x60 menit) Belajar terstruktur | | 5% |

| | | | | | | |
|--|--|---|------------|--|--|-----------------------|
| | | | | (2x2x60 menit) | | |
| | | | | | | Ketepatan menjelaskan |
| | | - | Tugas | Pembelajaran dalam kelas (2x2x50 menit) Belajar mandiri (2x2x60 menit) Belajar terstruktur (2x2x60 menit) | | 10% |
| | | - | Tugas | Pembelajaran dalam kelas (2x2x50 menit) Belajar mandiri (2x2x60 menit) Belajar terstruktur (2x2x60 menit) | | 10% |
| | | - | Tugas Quiz | Pembelajaran dalam kelas (2x2x50 menit) Belajar mandiri (2x2x60 menit) Belajar terstruktur (2x2x60 menit) | | 10% |
| | | - | Tugas | Pembelajaran dalam kelas (2x2x50 menit) Belajar mandiri (2x2x60 menit) Belajar terstruktur (2x2x60 menit) | | 10% |

| | | | | | | |
|--------------|-------------------------|---|------------|--|--|-----|
| | | - | Tugas | Pembelajaran dalam kelas (2x2x50 menit) Belajar mandiri (2x2x60 menit) Belajar terstruktur (2x2x60 menit) | | 10% |
| | | - | Tugas Quiz | Pembelajaran dalam kelas (2x2x50 menit) Belajar mandiri (2x2x60 menit) Belajar terstruktur (2x2x60 menit) | | 10% |
| | | - | Tugas | Pembelajaran dalam kelas (2x2x50 menit) Belajar mandiri (2x2x60 menit) Belajar terstruktur (2x2x60 menit) | | 10% |
| 15-16 | Evaluasi Akhir Semester | | | | | |
| Total | | | | | | 100 |