



INSTITUT TEKNOLOGI SEPULUH NOPEMBER (ITS)
FAKULTAS TEKNOLOGI ELEKTRO DAN INFORMATIKA CERDAS
DEPARTEMEN TEKNIK ELEKTRO
Program Studi Sarjana (S1) Teknik Elektro

*INSTITUT TEKNOLOGI SEPULUH NOPEMBER (ITS)
FACULTY OF INTELLIGENT ELECTRICAL & INFORMATICS TECHNOLOGY
DEPARTMENT OF ELECTRICAL ENGINEERING
Bachelor Degree Program in Electrical Engineering*

1	Nama Mata Kuliah / Course Name : Sistem Kontrol Adaptif / <i>Adaptive Control Systems</i>
2	Kode Mata Kuliah / Course Code : EE234736
3	Kredit / Credits : 2 SKS
4	Semester / Semester : 0

Deskripsi Mata Kuliah / Course Description

Mata Kuliah Sistem Kontrol Adaptif membahas tentang konsep sistem kontrol adaptif, baik yang langsung (direct) maupun yang tidak langsung (indirect), model parametrik sistem dinamik, metode estimasi parameter, estimasi parameter nonrekursif dan estimasi parameter rekursif, validasi model, sistem adaptif model referensi (MRAC), sistem adaptif self tuning regulator (STR) dan sistem kontrol adaptif yang menggunakan algoritma kecerdasan buatan. / *The course Adaptive Control Systems discusses the concept of adaptive control systems, both direct and indirect methods, parametric model of dynamic systems, parameter estimation methods, non-recursive and recursive parameter estimation, model validation, model reference adaptive control (MRAC) systems, self-tuning regulator (STR) adaptive systems, and adaptive control systems that employ artificial intelligence algorithms.*

Capaian Pembelajaran Lulusan (CPL) Yang Dibebankan Mata Kuliah / Program Learning Outcomes Charged to The Course

- 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 / *Able to design components, systems, and processes that are logical and realistic in accordance with specified specifications, while considering safety, social, cultural, environmental, and economic aspects.*
- CPL 6 Mampu mengkaji dan memanfaatkan matematika, ilmu pengetahuan alam dan teknologi serta mengidentifikasi, memformulasikan dan menyelesaikan

<p>permasalahan di bidang teknik elektro / <i>Able to evaluate and utilize mathematics, natural sciences, and technology, as well as identify, formulate, and solve problems in the field of electrical engineering.</i></p> <p>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 / <i>Able to understanding and applying the latest methods and skills in the field of science and technology to solve electrical engineering problems while emphasizing universal values.</i></p>
<p>Capaian Pembelajaran Mata Kuliah / Course Learning Outcomes</p>
<ol style="list-style-type: none"> 1. Menguasai konsep sistem adaptif dalam persoalan sistem pengaturan. / <i>Master the concept of adaptive systems in control system problems.</i> 2. Mampu memformulasikan persoalan identifikasi sistem untuk mengetahui perubahan karakteristik sistem / <i>Able to formulate system identification problems to determine changes in system characteristics.</i> 3. Mampu memahami dan merancang sistem kontrol adaptif jenis Model Reference Adaptive Control (MRAC) / <i>Able to understand and design Model Reference Adaptive Control (MRAC) systems.</i> 4. Mampu memahami dan merancang Self-tuning Regulator (STR) / <i>Able to understand and design Self-tuning Regulator (STR) systems.</i> 5. Mampu memahami penggunaan algoritma kecerdasan buatan untuk sistem kontrol adaptif / <i>Able to understand the use of artificial intelligence algorithms for adaptive control systems.</i>
<p>Pokok Bahasan / Contents</p>
<ol style="list-style-type: none"> 1. Konsep pengaturan adaptif / <i>Adaptive Control Concepts</i> 2. Model parametrik sistem, estimasi parameter, validasi model / <i>Parametric System Models, Parameter Estimation, Model Validation</i> 3. Sistem adaptif model reference (MRAC) / <i>Model Reference Adaptive Control (MRAC) System</i> 4. Sistem adaptif self-tuning (STR) / <i>Self-Tuning Adaptive Control (STR) System</i> 5. Sistem pengaturan adaptif dengan algoritma kecerdasan buatan / <i>Adaptive Control Systems with Artificial Intelligence Algorithms</i>
<p>Prasyarat / Pre-requisite</p>
<p>Pustaka / Reference</p>
<ol style="list-style-type: none"> 1. Astrom, KJ and Wittenmark, B.: "Adaptive Control", Addison-Wesley, 1997 2. Landau, ID,: "System Identification and Control Design", Prentice-Hall, 1990 3. Tao, Gang, : " Adaptive Control, Design and Analysis", John Wiley & Sons, 2003 4. Sastry, S. and Bodson,M: "Adaptive Control Stabliity, Convergence and Robustness", Prentice-Hall, 1989