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

1	**Nama Mata Kuliah**	:	Rekayasa Sistem Radar
2	**Kode Mata Kuliah**	:	EL234710
3	**Kredit**	:	3 SKS
4	**Semester**	:	Pilihan

Deskripsi Mata Kuliah

Mata kuliah ini merupakan mata kuliah pilihan yang ditawarkan kepada mahasiswa Program Studi Sarjana Teknik Telekoomunikasi, Departemen Teknik Elektro ITS. Secara umum, capaian pembelajaran pada mata kuliah ini terdiri dari pemahaman terhadap konsep dasar sistem radar, mekanisme deteksi dalam berbagai kondisi dan berbagai jenis sinyal radar. Di akhir sesi kuliah, mahasiswa akan dipandu untuk dapat melakukan perancangan sederhana sistem radar berdasarkan spesifikasi misi yang disyaratkan.

Capaian Pembelajaran Lulusan (CPL) Yang Dibebankan Mata Kuliah

1. (CPL-02) Mampu mengkaji dan memanfaatkan ilmu pengetahuan dan teknologi dalam rangka mengaplikasikannya pada bidang Teknik Telekomunikasi, serta mampu mengambil keputusan secara tepat dari hasil kerja sendiri maupun kerja kelompok dalam bentuk laporan tugas akhir atau bentuk kegiatan pembelajaran lain yang luarannya setara dengan tugas akhir melalui pemikiran logis, kritis, sistematis dan inovatif.
2. (CPL-04) Mampu menerapkan ilmu pengetahuan alam dan matematika serta teknologi dan rekayasa informasi untuk memperoleh pemahaman komprehensif pada bidang Teknik Telekomunikasi.
3. (CPL-08) Mampu mengetahui dan mengaplikasi metode dan keahlian sesuai perkembangan terkini di bidang ilmu pengetahuan dan teknologi untuk menyelesaikan permasalahan di bidang Teknik Telekomunikasi dengan mengedepankan nilai-nilai universal.

Capaian Pembelajaran Mata Kuliah

1. Mampu menjelaskan konsep dasar sistem radar
2. Mampu menjelaskan persamaan radar dan parameternya.
3. Mampu menjelaskan mekanisme deteksi sistem radar beserta pemasalahan dan solusinya
4. Mampu menjelaskan berbagai jenis radar beserta aplikasinya
5. Mampu melakukan perancangan sederhana sistem radar

Pokok Bahasan

1. Konsep Dasar Sistem Radar
2. Persamaan Radar dan Parameter Pulsed Radar
3. Propagasi Sinyal Radar

4. Transmitter Radar
5. Receiver Radar
6. Deteksi Radar dalam Noise
7. Clutter dan Penanganannya
8. Radar Doppler
9. Radar Tracking
10. Perancangan Sederhana Sistem Radar

Prasyarat

Pengolahan Sinyal Digital, Antena dan Propagasi Radio

Pustaka

1. M. I. Skolnik, Introduction to Radar System 3rd Ed.,Mc Graw Hill 2002.
2. B. R. Mahafza, Radar system analysis and design using Matlab, CRC Press, 2000.
3. R. Curry, Radar System Performance Modeling, 2nd Edition, Artech House, 2004

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FACULTY OF INTELLIGENT ELECTRICAL AND INFORMATICS TECHNOLOGY
DEPARTMENT OF ELECTRICAL ENGINEERING
Undergraduate Study Programme (S1) Telecommunication Engineering

1	**Course Name**	:	Radar System Engineering
2	**Course Code**	:	EL234710
3	**Credit**	:	3 CREDITS
4	**Semester**	:	Options

Course Description

This course is an elective course offered to students of the Telecommunication Engineering Undergraduate Study Programme, Department of Electrical Engineering ITS. In general, the learning outcomes in this course consist of understanding the basic concepts of radar systems, detection mechanisms in various conditions and various types of radar signals. At the end of the lecture session, students will be guided to be able to perform a simple radar system design based on the required mission specifications.

Graduate Learning Outcomes (SLOs) Charged Courses

1. (CPL-02) Able to study and utilise science and technology in order to apply it in the field of Telecommunication Engineering, and be able to make decisions appropriately from the results of one's own work and group work in the form of a final project report or other forms of learning activities whose output is equivalent to the final project through logical, critical, systematic and innovative thinking.
2. (CPL-04) Able to apply natural science and mathematics as well as technology and information engineering to gain a comprehensive understanding of the field of Telecommunication Engineering.
3. (CPL-08) Able to know and apply methods and expertise according to the latest developments in the field of science and technology to solve problems in the field of Telecommunication Engineering by promoting universal values.

Course Learning Outcomes

1. Able to explain the basic concepts of radar systems
2. Able to explain the radar equation and its parameters.
3. Able to explain the detection mechanism of radar systems along with problems and solutions
4. Able to explain various types of radar and their applications
5. Able to do simple design of radar system

Subject matter

1. Basic Concepts of Radar Systems
2. Radar Equations and Pulsed Radar Parameters
3. Radar Signal Propagation

4. Radar Transmitter
5. Radar Receiver
6. Radar Detection in Noise
7. Clutter and Handling
8. Doppler Radar
9. Radar Tracking
10. Simple Design of Radar System

Prerequisites

Digital Signal Processing, Antennas and Radio Propagation

Library

1. M. I. Skolnik, Introduction to Radar Systems 3rd Ed., Mc Graw Hill 2002.
2. B. R. Mahafza, Radar system analysis and design using Matlab, CRC Press, 2000.
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