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

1	**Nama Mata Kuliah / Course Name**	:	Software Defined Network
2	**Kode Mata Kuliah / Course Code**	:	EL234717
3	**Kredit / Credits**	:	2 SKS
4	**Semester / Semester**	:	Pilihan / Elective Course

Deskripsi Mata Kuliah / Course Description

Mata kuliah ini mengenalkan software defined network dan ekosistemnya. Untuk menunjang pemahaman permasalahan dan desain SDR akan dipelajari dasar desain sistem RF dan arsitektur penerima dan pemancar, dilanjutkan dengan pembahasan berbagai platform untuk membangun SDR dan software radio beserta desain laju sampling. Selanjutnya akan dipelajari berbagai konsep dan pendekatan sistem radio kognitif dan arsitektur yang telah diusulkan, yang dilanjutkan dengan jaringan radio kognitif dan dynamic spectrum access. Mahasiswa juga akan dikenalkan penerapan platform open flow untuk Software Defined Radio.

This course introduces software-defined networking and its ecosystem. To support the understanding of SDR issues and design, the basics of RF system design and receiver and transmitter architecture will be studied. This will be followed by discussions on various platforms for building SDR and software radio, including sampling rate design. Furthermore, various concepts and approaches to cognitive radio systems and proposed architectures will be explored, followed by cognitive radio networks and dynamic spectrum access. Students will also be introduced to the application of the OpenFlow platform for Software-Defined Radio.

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

1. (CPL-05) Mampu merancang komponen, sistem, dan proses yang logis dan realistis sesuai dengan spesifikasi yang ditentukan dengan mempertimbangkan aspek keselamatan, sosial, budaya, lingkungan, dan ekonomi.
   (PLO-05) Able to design components, systems, and/or processes to meet desired needs within realistic constraints in such aspects as law, economic, environment, social, politics, health and safety, sustainability as well as to recognize and/or utilize the potential of local and national resources with global perspective

2. (CPL-06) Mampu merancang dan melaksanakan eksperimen laboratorium dan/atau lapangan, menganalisa dan menginterpretasi data, serta menggunakan penilaian yang obyektif untuk menarik kesimpulan.
   (PLO-06) Able to design and conduct laboratory and/or field experiments as well as to analyze and interpret data to strengthen the engineering judgment to draw conclusions

3. *(CPL-07) Mampu mengidentifikasi, memformulasikan, menganalisis, dan menyelesaikan permasalahan kompleks di bidang teknik telekomnikasi.*
   (PLO-07) Able to identify, formulate, analyze, and solve the complex problems in the field of Telecommunication Engineering

4. (CPL-8) 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
   (PLO-08) Able to know and apply methods, skills according to the latest developments in the field of science and technology to solve electrical engineering problems by prioritizing universal values

Capaian Pembelajaran Mata Kuliah / Course Learning Outcomes

1. Menguasai konsep dan prinsip software-defined network / *Mastering the concepts and principles of software-defined networking.*
2. Menguasai kontrol dan pemisahan bidang data dalam SDN / *Mastering control and data plane separation in SDN.*
3. Menerapkan virtualisasi jaringan / *Implementing network virtualization.*
4. Memahami Penerapan SDN dan ekosistemnya / *Understanding the implementation of SDN and its ecosystem.*
5. Merancang SDN dan menguasai pengembangannya / *Designing SDN and mastering its development.*

Pokok Bahasan / Contents

1. Pengantar software defined network / *Introduction to software-defined networking.*
2. Pengantar Openflow sebagai Platform SDN / *Introduction to OpenFlow as an SDN platform.*
3. Kontrol dan pemisahan bidang data pada SDN / *Control and data plane separation in SDN.*
4. Virtualisasi Jaringan pada SDN / *Network virtualization in SDN.*
5. Ekosistem SDN / *SDN ecosystem.*
6. Penerapan dan manajemen SDN / *Implementation and management of SDN.*
7. Rancangan SDN dan pengembangannya / *SDN design and its development.*

Prasyarat / Pre-requisite

Rekayasa Internet

Internet Engineering

Pustaka / Reference

1. Siamak Azodolmolky, “Software Defined Networking with OpenFlow”, Packt Publishing, 2013
2. Paul Goransson and Chuck Black, Timothy Culver, Software Defined Networks: A Comprehensive Approach, 2nd Edition, Morgan Kaufmann, 2017
3. Cheng Sheng Jie Bai Qi Sun, Sofware-Defned Wide Area Network Architectures and Technologies, CRC Press, 2021