



Kadi Sarva Vishwavidyalaya

Faculty of Engineering & Technology

Fourth Year Bachelor of Engineering (IT)

(To be Proposed For: Academic Year 2020-21)

Subject Code: IT704E-N	Subject Title: Software Define Network
Pre-requisite	Computer Network

Teaching Scheme (Credits and Hours)

Teaching scheme				Total Credit	Evaluation Scheme					
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract.	Total
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
04	00	02	06	05	03	70	30	20	30	150

Course Objective:

- This course introduces software defined networking, an emerging paradigm in computer networking that allows a logically centralized software program to control the behavior of an entire network.
- Differentiate between traditional networks and software defined networks

Outline of the Course:

Sr. No	Title of the Unit	Minimum Hour
1	Introduction to SDN	13
2	SDN Abstractions	16
3	Programming SDN's	13
4	SDN Applications and use cases	12
5	SDN'S Future And Perspectives	10

Total hours (Theory): 64

Total hours (Lab): 32

Total hours: 96



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Detailed Syllabus

Sr. No	Topic	Lecture Hours	Weight age(%)
1	INTRODUCING SDN: SDN Origins and Evolution – Introduction – Why SDN? - Centralized and Distributed Control and Data Planes - The Genesis of SDN	13	20
2	SDN ABSTRACTIONS: How SDN Works - The Openflow Protocol - SDN Controllers: Introduction - General Concepts - VMware - Nicira - VMware/Nicira - OpenFlow-Related - Mininet - NOX/POX - Trema - Ryu - Big Switch Networks/Floodlight - Layer 3 Centric - Plexxi - Cisco OnePK	16	25
3	PROGRAMMING SDN'S: Network Programmability - Network Function Virtualization - NetApp Development, Network Slicing	13	20
4	SDN APPLICATIONS AND USE CASES: SDN in the Data Center - SDN in Other Environments - SDN Applications - SDN Use Cases - The Open Network Operating System 3	12	19
5	SDN'S FUTURE AND PERSPECTIVES: SDN Open Source - SDN Futures - Final Thoughts and Conclusions	10	16
Total		64	100

Instructional Method and Pedagogy:

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.
- One internal exam will be conducted as a part of internal theory evaluation.
- Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
- Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.

Learning Outcome:

On successful completion of this course, the student should be able to:

- Understand advanced and emerging networking technologies
- Obtain skills to do advanced networking research and programming
- Learn how to use software programs to perform varying and complex networking tasks
- Expand upon the knowledge learned and apply it to solve real world problems



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Reference Books:

1. Software Defined Networks: A Comprehensive Approach by Paul Goransson and Chuck Black, Morgan Kaufmann Publications, 2014
2. SDN - Software Defined Networks by Thomas D. Nadeau & Ken Gray, O'Reilly, 2013
3. Software Defined Networking with OpenFlow By SiamakAzodolmolky, Packt Publishing, 2013
4. Kreutz, Diego, et al. "Software-defined networking: A comprehensive survey." Proceedings of the IEEE 103.1 (2015): 14-76.

List of experiments

No	Name of Experiment
1	Introducing Mininet 3
2	Setting up the Environment and Implementation of Controllers in Mininet 3
3	Mininet, Custom Topologies in POX, ODL, Floodlight 3
4	Click, ONOS, Northbound – Southbound Interfacing, ONOS deployment
5	ONOS – OPNFV – SDN Application development 3

Students will perform at least 5 programming exercises and implement one mini-project. The students can work in groups of 2 or 3.