DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Name of the programme and specialization	B.Tech and CSE		
Course Title	SOFTWARE DESIGNED NETWORKING (Theory)		
Course Code	CSHO13	No. of Credits	3
Course Code of Pre-requisite subject(s)	CSPC27		
Session	August 2018	Section (if, applicable)	A & B
Name of Faculty	Mrs.V.DHIVYA	Department	CSE
Email	vdhiviraj@gmail.com	Telephone No.	
Name of Course Coordinator(s) (if, applicable)			
E-mail		Telephone No.	
Course Type	☐ Core course	☐ Elective course	

Syllabus (approved in BoS)

Software Defined Networking (Theory)

Unit – I

Introduction, Control Plane, Data Plane, Distributed Control Planes, IP and MPLS, Creating the IP Underlay, Convergence Time, Load Balancing High Availability, Creating the MPLS Overlay, Replication, Centralized Control Planes – Logical Versus Litera, ATM/LANE, Route Servers, Wire Protocol, FAWG, Config and Extensibility, Architecture, Hybrid Approaches – Ships in the Night, Dual Function Switches.*

Unit – II

VMware, Nicira, Mininet, NOX/POX, Trema, Ryu, Big Switch Networks/Floodlight, Layer 3 Centric – L3VPN, Path Computation Element Server, Plexxi Affinity, Cisco OnePK, Management Interface, Network Divide, Modern Programmatic Interfaces, Modern Orchestration.*

Unit – III

Multitenant Data Center, Virtualized Multitenant Data Center, SDN Solutions for Data Center Network, VLANs, EVPN, VxLan, NVGRE, Virtualization and Data Plane I/O, Services Engineered Path, Service Locations and Chaining, NEV at ETSI, Non-ETSI NEV Work.*

Unit – IV

Network Topology, Traditional Methods, LLDP, BGP-TE/LS, ALTO, I2RS, Build Code First, The Juniper SDN Framework(s), Open Daylight Controller/Framework, Policy.*

Unit – V

Bandwidth Scheduling, Manipulation, Calendaring- Bandwidth Calendaring, Big Data and Application Hyper – Virtualization for Instant CSPF, Expanding Technology, Use Cases for Data Center Overlays, Big Data, Network Function Virtualization - Data Center Orchestration, Puppet, Network Function Virtualization, Optimized Big Data, - Firewall as Service, Network Access Control Replacement, Virtual Firewall, Feed Back and Optimization, Intrusion Detection/Threat Mitigation.*

COURSE OBJECTIVES

> To know the reduced Complexity of Network Operation
> To understand the concepts of minimize Layer and maximize Network Resources
> To understand the Faster Time to Revenue for New Applications

COURSE OUTCOMES (CO)

> Ability to comprehend Software Defined Networks
> Ability to compare and analyze the advantages of SDN over traditional network
> Ability to design and implement software defined network

Course Outcomes	Aligned Programme Outcomes (PO)
Ability to comprehend Software Defined Networks	PO 1, PO 3, PO 4
Ability to compare and analyze the advantages of SDN over traditional network	PO 1, PO 4
Ability to design and implement software defined network	PO 1, PO 3, PO 4

COURSE PLAN – PART II

COURSE OVERVIEW

To explore the emerging definitions, protocols and standards for SDN- software designed, software defined, programmable networks. The subject explores the current state of the open flow model and centralized network control. It helps to examine the structure and capabilities of commercial and open source controllers. Explains existing technologies for network programmability.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week	Topic	Mode of Delivery
1.	1	Introduction, Control Plane, Data Plane, Distributed Control Planes, IP and MPLS, Creating the IP Underlay, Convergence Time, Load Balancing High Availability, Creating the MPLS Overlay,	Chalk and Talk PPT

		Replication	
2.	2	Centralized Control Planes – Logical Versus Litera, ATM/LANE, Route Servers, Wire Protocol, FAWG, Config and Extensibility, Architecture, Hybrid Approaches – Ships in the Night, Dual Function Switches.*	Chalk and Talk PPT
3.	3	VMware, Nicira, Mininet, NOX/POX, Trema, Ryu, Big Switch Networks/Floodlight, Layer 3 Centric – L3VPN, Path Computation Element Server, Plexxi Affinity, Cisco OnePK,	Chalk and Talk PPT
4.	4	Management Interface, Network Divide, Modern Programmatic Interfaces, Modern Orchestration.*	Chalk and Talk PPT
5.	5	Multitenant Data Center, Virtualized Multitenant Data Center, SDN Solutions for Data Center Network, VLANs, EVPN, VxLan, NVGRE	Chalk and Talk PPT
6.	6	Virtualization and Data Plane I/O, Services Engineered Path, Service Locations and Chaining, NEV at ETSI, Non-ETSI NEV Work.*	Chalk and Talk PPT
7.	7	Network Topology, Traditional Methods, LLDP, BGP-TE/LS, ALTO, I2RS	Chalk and Talk PPT
8.	8	Build Code First, The Juniper SDN Framework(s), Open Daylight Controller/Framework, Policy.	Chalk and Talk PPT
9.	9	Bandwidth Scheduling, Manipulation, Calendaring - Bandwidth Calendaring, Big Data and Application Hyper – Virtualization for Instant CSPF, Expanding Technology, Use Cases for Data Center Overlays, Big Data	Chalk and Talk PPT
10.	10	Network Function Virtualization - Data Center Orchestration, Puppet, Network Function Virtualization, Optimized Big Data, - Firewall as Service, Network Access Control Replacement,Virtual Firewall,Feed Back and Optimization,IntrusionDetection/Threat Mitigation.	Chalk and Talk PPT

The assessment in this course has Theory. The assessment in Theory component has cycle test and final assessment whose details are given in the below table. The assessment in Theory will be done for a total of 70 marks. The total marks for this course is 100.

COURSE ASSESSMENT METHODS-THEORY (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Cycle Test-1	3rd week of Sep	1 hour	20
2	Cycle Test-2	2nd week of Oct	1 hour	20
3	Assingment	4th week of Sep 3rd week of Oct		20
CPA	Compensation Assessment*	1st week of Nov	1 hour	20
4	Final Assessment* Theory	2nd week of Nov	3 hours	40
	TOTAL			100

*mandatory

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

1. Students' feedback through class committee meetings.
2. Feedback questionnaire from students – from MIS at the end of the semester.

COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)

MODE OF CORRESPONDENCE (email/ phone etc)
Mode of Correspondence through Phone.

COMPENSATION ASSESSMENT POLICY
In case of emergency, the student should submit compensatory assignments on submission of appropriate documents as proof. Compensatory assessments would be framed according to the time frame available and the assessment task missed by the students.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- ➤ At least 75% attendance in each course is mandatory.

- ➤ A maximum of 10% shall be allowed under On Duty (OD) category.

- ➤ Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

ACADEMIC DISHONESTY & PLAGIARISM

> - Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.

> - Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.

> - The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

The above policy against academic dishonesty shall be applicable for all the programmers.

ADDITIONAL INFORMATION
The students can get their doubts clarified at any time with their faculty member.

FOR APPROVAL

Course Faculty V.Dhige   CC-Chairperson _____ HOD _____