

21CSE25	SOFTWARE DEFINED NETWORK	L	T	P	C
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<b><u>Course Objectives</u></b> <ul style="list-style-type: none"> <li>To develop knowledge in networking fundamentals</li> <li>To gain conceptual understanding of Software Defined Networks (SDN)</li> <li>To study industrial deployment use-cases of SDN</li> </ul>					
<b>UNIT I</b>	<b>INTRODUCTION TO SDN</b>	<b>9 Hours</b>			
Overview; History and evolution of SDN; Architecture of SDN; SDN Flavours; Scalability (Data Centres, Service provider networks, ISP Automation); Reliability (QoS, and Service Availability); Consistency (Configuration management, and Access Control Violations); Opportunities and Challenges					
<b>UNIT II</b>	<b>ARCHITECTURE</b>	<b>9 Hours</b>			
Network Operating System (NOS). SDN Architecture. Planes - data, management and control. Interfaces - northbound and southbound.					
<b>UNIT III</b>	<b>PROTOCOLS</b>	<b>9 Hours</b>			
Languages and functions available for programming SDNs, northbound API. Mininet. Software vs. Hardware SDN switch implementations - Open vSwitch, WhiteBox, ONL. Controller implementations - POX, NOX, Beacon, Floodlight. Special Purpose controllers - Flowvisor, RouteFlow.					
<b>UNIT IV</b>	<b>DESIGN AND DEVELOPMENT</b>	<b>9 Hours</b>			
Network Programmability - Network Function Virtualization - NetApp Development, Network Slicing, SDX; Northbound Application Programming Interface, Current Languages and Tools, Composition of SDNs.					
<b>UNIT V</b>	<b>PROGRAMMING</b>	<b>9 Hours</b>			
Network Virtualization, Network Topology and Topological Information Abstraction, Data Centric Traffic Management, Wide Area Traffic Management, Wireless networks					
<b><u>Course Outcomes:</u></b> At the end of the course, Students can able to <ul style="list-style-type: none"> <li>Examine the challenges and opportunities associated with adopting SDN compared to traditional approaches to networking</li> <li>Analyse the functions and components of the SDN architecture</li> <li>Discuss the major requirements of the design of an SDN protocol.</li> <li>Design and create an SDN network consisting of SDN switches and a centralized controller.</li> <li>Analyze the performance of the SDN network by using verification and troubleshooting techniques. 6. Evaluate the emerging SDN applications.</li> </ul>					
<b><u>Text books:</u></b> 1. Goransson, Paul, Chuck Black, and Timothy Culver. Software defined networks: a comprehensive approach, 1st edition, Morgan Kaufmann, 2016.					

**Reference Books:**

1. Stallings, William. Foundations of modern networking: SDN, NFV, QoE, IoT, and Cloud, 1st edition, Addison-Wesley Professional, 2015.
2. Oswald Coker, Siamak Azodolmolky. Software-Defined Networking with OpenFlow - Second Edition, Packt Publishing, 2017