

| ITE6017 - Software Defined Networking | | | |
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| Pre-Req: NIL | | L T P J C 2 0 0 4 3 | |
| Objectives: 1. To know the importance of software defined networking framework in becoming a more productive data scientist. 2. To help the students to develop more efficient virtual environment and software framework to design and manage networks. | | | |
| Expected Outcome : On completion of this course, student should be able to 1. Select, design, analyze, implement, and evaluate effective controllers for a number of different network platforms and applications. 2. Design and implementing network security and management applications within the context of the new Software Defined Network (SDN) paradigm Map real-world problems to algorithmic solutions. 3. Identify the existence of problems which defy existing solution. | | | |
| Module | Topics | L Hrs | SLO |
| 1 | The Evolution of SDN: The OpenFlow specification process, Example SDN Use Cases, SDN elements, Inside the Extensibility Working Group, The Road to SDN, OpenFlow and Network OSes | 4 | 2 |
| 2 | Control and data plane separation: Centralized Controller, protocols, Data, Control, and Management Planes, Switch: Match on Destination MAC, Forwarding vs. Routing, Distributed Control Plane, Traffic Engineering Problem | 4 | 14 |
| 3 | SDN Software Stack: Simple Enterprise Design, Virtual Local Area Networks, Server Virtualization and Virtual Switches, Virtual Machines, SDN Architecture, SDN Controllers, open-source controllers. | 4 | 14 |
| 4 | Network Virtualization: Network Virtualization roadmap, network parameters, Network architecture, Virtual Private Networks, Network Virtualization Model, Network function virtualization. | 4 | 6 |
| 5 | Data Plane: Writing SDN Controller Apps, Event-Driven Programming, OpenFlow 1.0 Switch, packet transmission, Creating a Learning Switch, analysis of Traffic Statistics, Bugs and verification process, Packets in Multiple Dimensions | 4 | 14 |
| 6 | Programming SDNs: Network Control Loop, Language-Based Abstractions, Policy in OpenFlow, Virtual Header Fields, Queries as Buckets, Combining Many Networking Tasks, Modular Controller Applications, Parallel | 4 | 2 |

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| | Composition | | |
| 7 | Bandwidth scheduling and Optimizing Big Data: Bandwidth Calendaring, Big Data and Application Hyper-Virtualization for Instant CSPF, Data Center Orchestration, Network Function Virtualization (NFV), Optimized Big Data | 4 | 2 |
| 8 | Contemporary Issues | 2 | |
| Total Lecture Hours # Mode: Flipped Class Room, [Lecture to be videotaped], Use of physical and computer models to lecture, Visit to Industry, Min of 2 lectures by industry experts | | 30 | |
| Text Books 1. Thomas D. Nadeau , SDN: Software Defined Networks An Authoritative Review of Network Programmability Technologies, Ken Gray Publisher: O'Reilly Media Final Release, 2013 Reference Books 1. Siamak Azodolmolky, “Software Defined Networking with OpenFlow” PACKT publishers, 2013 | | | |

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| Approved by Academic Council No.:47 | Date: | 05.10.2017 |
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